Greenbag Road Improvement Project

FINDING OF NO SIGNIFICANT IMPACT

Monongalia County, West Virginia

State Project: U331-857-0.67
Federal Project: STP-0857(019)D

U.S. Department of Transportation
Federal Highway Administration

West Virginia Department of Transportation
Division of Highways

December 20, 2021

State Project Number: U331-857-0.67
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GREENBAG ROAD IMPROVEMENT PROJECT

Monongalia County, West Virginia

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U.S. Department of Transportation
Federal Highway Administration
West Virginia Division

and

West Virginia Department of Transportation
Division of Highways

The Federal Highway Administration (FHWA) and the West Virginia Department of Transportation, Division of Highways (WVDOH) have prepared an Environmental Assessment (EA) to identify and evaluate the potential environmental impacts associated with the proposed operational improvements along 1.65 miles of Greenbag Road (CR 857) in Monongalia County, West Virginia.

The EA was approved by the FHWA on August 28, 2020 and is incorporated here by reference. A virtual public meeting was held on September 29, 2020. The EA analyzes the potential impacts of the proposed action on the natural, physical, socioeconomic, and cultural (historic and archaeological) environment. In accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40CFR 1500-1508) and FHWA's Environmental Impact and Related Procedures (23 CFR 771), the no-build alternative and two build alternatives were considered as well as three separate options for changes at each of the two major intersections. The EA determined that the build alternatives have similar impacts to most resources. They differ primarily in the numbers of residential displacements and the level of service. Alternative 2/C/F does not involve any residential displacements and meets the Level of Service design year criteria. WVDOH and FHWA identified Alternative 2/C/F as the EA Preferred Alternative. The design of the EA Preferred Alternative has been further refined since the approval of the EA and is the Modified Preferred Alternative addressed in this Finding of No Significant Impact (FONSI).

Direct, indirect, and cumulative impacts on the natural, physical, socioeconomic, and cultural environments from the Modified Preferred Alternative are not anticipated to be significant.

This FONSI was prepared according to the CEQ regulations (40 CFR 1500-1508). FHWA has determined that the construction of the Modified Preferred Alternative has no significant impact on the human environment within the meaning of the National Environmental Policy Act of 1969 (42 USC 4321 et seq.). This FONSI is based on the EA, which was independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues and impact of the project, and appropriate mitigation measures. It provides sufficient evidence of analysis for determining that preparation of an Environmental Impact Statement is not required.

1/13/22
Date of Approval

Federal Highway Administration
West Virginia Division

EXECUTIVE SUMMARY

The West Virginia Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), proposes to provide operational improvements along 1.65 miles of Greenbag Road (County Route (CR) 857), located southeast of the City of Morgantown in Monongalia County. This Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor.

An Environmental Assessment (EA) was prepared to evaluate the environmental impacts of the project in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. In the EA, The WVDOH and FHWA considered multiple alternatives and their potential impacts to the local environment. Two build alternatives were considered as well as three separate options for changes at each of the two major intersections.

Following consideration of impacts, public comments, and the purpose and need, WVDOH and FHWA identified Alternative 2 with intersection options C and F as the EA Preferred Alternative. The design of the EA Preferred Alternative has been further refined since approval of the EA and is the Modified Preferred Alternative addressed in this Finding of No Significant Impact (FONSI).

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Acronyms and Abbreviations

BG	Block Group
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CR	County Route
CT	Census Tract
DD	Design Directive
EA	Environmental Assessment
EJ	Environmental Justice
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FCI	Federal Correctional Institution
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
LESA	Land Evaluation and Site Assessment
LOS	Level of Service
MMMPO	Morgantown Monongalia Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NLEB	Northern Long Eared Bat
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PEM	Palustrine Emergent
PFO	Palustrine Forested
ROW	Right-of-way
RTE	Rare, Threatened and Endangered
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USFWS	U.S. Fish and Wildlife Service
WVDEP	West Virginia Department of Environmental Protection
WVDNR	West Virginia Division of Natural Resources
WVDOH	West Virginia Division of Highways

PROJECT SUMMARY

The West Virginia Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), proposes to provide operational improvements along 1.65 miles of Greenbag Road (County Route (CR) 857), located southeast of the City of Morgantown in Monongalia County (Figure 1). This Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor.

An Environmental Assessment (EA) was prepared to evaluate the environmental impacts of the project in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. In the EA, The WVDOH and FHWA considered multiple alternatives and their potential impacts to the local environment. Two build alternatives were considered as well as three separate options for changes at each of the two major intersections. The EA was approved by FHWA on August 28, 2020 for public review and comment and is attached here as Appendix A. A virtual public meeting was held on September 29, 2020 with comments due on October 29, 2020. The comment period was extended to November 30, 2020.

Following consideration of impacts and the purpose and need, WVDOH and FHWA identified Alternative 2 with intersection options C and F as the EA Preferred Alternative. The design of the EA Preferred Alternative has been further refined since approval of the EA and is the Modified Preferred Alternative addressed in this Finding of No Significant Impact (FONSI).

Project Purpose and Need

The purpose of the Project is to provide operational improvements along Greenbag Road (CR 857) to reduce congestion and address the lack of safe non-motorized connections along the corridor.

Greenbag Road (CR 857) is classified as a minor arterial road that provides a convenient route to connect the eastern and southern neighborhoods of the Morgantown area. The Project is needed to ensure safe and efficient transportation access for motorized and non-motorized use of the corridor.

Traffic congestion in the Greenbag Road (CR 857) corridor has been investigated and documented in two different reports. The preliminary study was completed by the Morgantown Monongalia Metropolitan Planning Organization (MMMPO) and documented in the *Greenbag Road Corridor Study* (2015). A traffic study titled *Greenbag Road (CR857) Preliminary Investigation and Engineering Traffic Study* was completed in 2019 and supplemented with additional information in the *Traffic Analysis Supplement Letter for the Greenbag Road (CR857) Preliminary Investigation and Engineering Traffic Study.* The traffic study and supplemental letter are included as Appendix B.

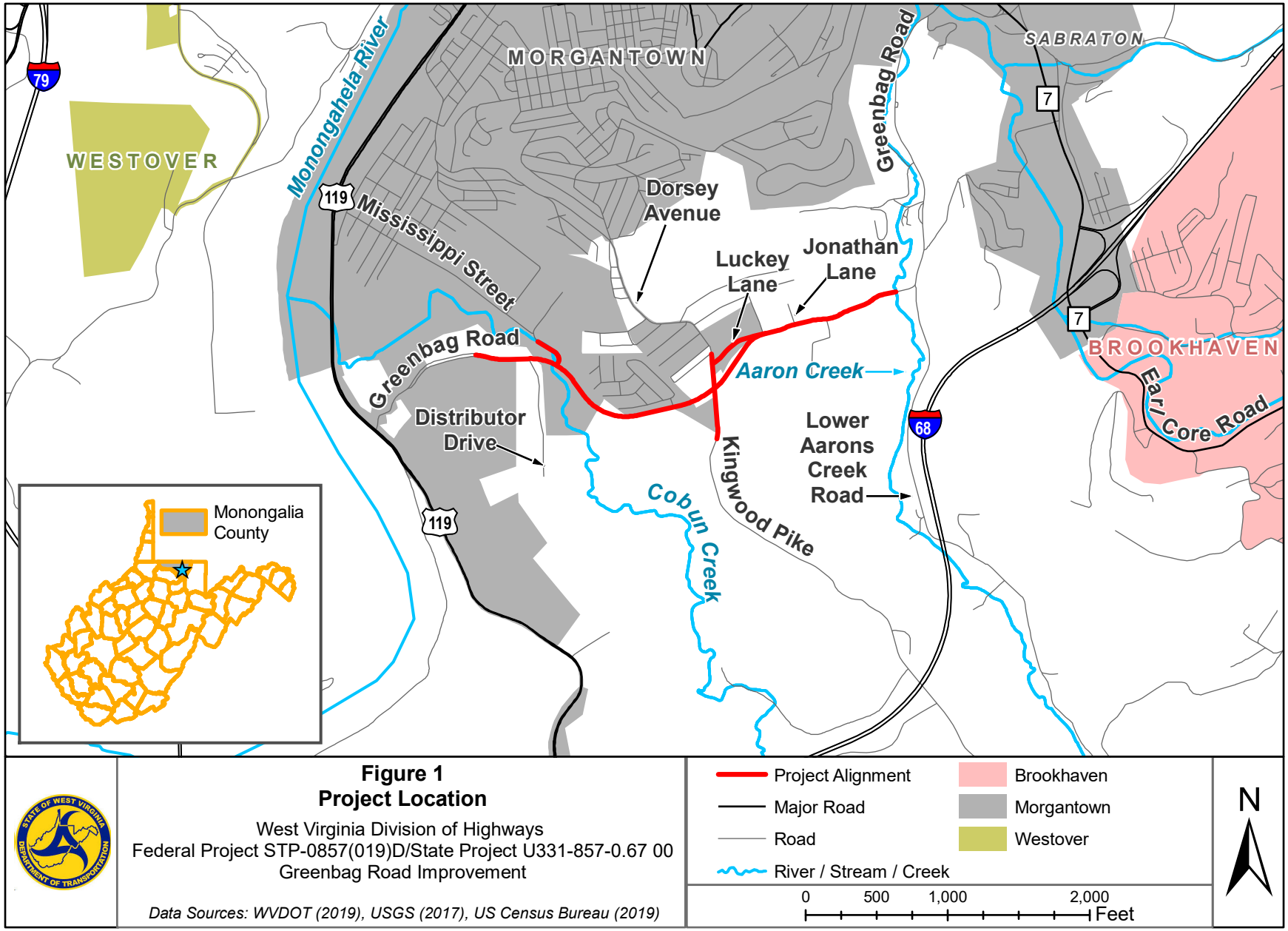


Figure 1
Project Location

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: WVDOT (2019), USGS (2017), US Census Bureau (2019)

ALTERNATIVES ANALYSIS

The EA analyzed impacts from two build alternatives, the no build alternative and three individual options for changes to each of the intersections. With all possible combinations of build alternatives and intersection options, there were 18 alternatives included in the impacts analysis. Prior to the development of the EA several additional ideas were assessed and eliminated from further analysis in the EA. These additional ideas are presented below.

SUMMARY OF "OPTION G" SCENARIO

Following the publishing of the EA, a petition was created by local landowners to propose a fourth intersection option for the Greenbag Road and Dorsey Ave/Kingwood Pike intersection, named "Option G". The petition was signed by 1,115 individuals. The full petition and signatories are available as an Appendix to the Public Meeting Summary Report (Appendix C).

The scenario, as outlined in the petition,

> "The option … combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA.
>
> These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would:
>
> - Improve the safety and access for motorized and non-motorized connections;
> - Reduce impacts to natural resources;
> - Preserve significantly more of the adjacent farmland of statewide importance;
> - Reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands;
> - Limit disturbance to unsuitable soils with a history of slips to prevent likelihood of property damage or loss;
> - Limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation;
> - Reduce construction costs."

The scenario described in "Option G" was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Road at the Dorsey Avenue / Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase.

Justification for not advancing this scenario: Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection Level of Service (LOS) improvements; however, LOS C or better for all movements, approaches and overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was

revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.

SUMMARY OF OTHER SCENARIOS REVIEWED

The analysis of the Greenbag Road / Mississippi Avenue intersection options A, B, and C, and the Greenbag Road / Dorsey Avenue / Kingwood Pike intersection options D, E, and F were detailed in the EA. In addition to Options A-F, the following design scenarios were also evaluated in earlier stages of project development (see Appendix B – Traffic Analysis), but were ruled out for various reasons as described below.

Greenbag Road / Mississippi Avenue

- **Maintained Two-Way Stop Controlled Operations -** Three scenarios, including the following:
  - Installation of an eastbound left turn lane only,
  - Installation of an eastbound left turn lane with a westbound right turn lane on Greenbag Road,
  - Installation of an eastbound left turn lane and widening the southbound Mississippi Avenue approach to provide two lanes (an exclusive left turn lane and an exclusive right turn lane).

  Justification for not advancing these scenarios: Results from the traffic analysis did not satisfy WVDOH's LOS C design year criteria threshold for congestion improvement.

- **3-Phase Traffic Signal -** Installation of an eastbound left turn lane on Greenbag Road and widening southbound Mississippi Avenue approach to provide two lanes (exclusive left turn lane and an exclusive right turn lane).

  Justification for not advancing this scenario: Results from the traffic analysis did not satisfy WVDOH's LOS C design year criteria threshold for congestion improvement.

- **Continuous Green T-Intersection Traffic Signal -** Widening all approaches to provide an exclusive lane for every movement. Eastbound approach providing 2 lanes (an exclusive left turn lane and exclusive through lane), westbound approach providing 2 lanes (an exclusive through lane and an exclusive right turn lane), and southbound approach providing 2 lanes (an exclusive left turn lane and an exclusive right turn lane). With a Continuous Green T-Intersection Traffic Signal, the eastbound through movement traverses the intersection via a delineated lane, which provides a protected continuous Green Through the intersection. The southbound left turn movement would provide its own exclusive lane onto Greenbag Road which would merge into the eastbound through traffic.

  Justification for not advancing this scenario: WVDOH's LOS C design year criteria threshold for congestion improvement was satisfied, but another option's forecasted LOS results were preferable since it achieved a better LOS.

- **Roundabout -** An additional single-lane roundabout design on top of Options B and C, where the eastbound Greenbag Road approach would provide one lane (shared left turn

/ through), the westbound Greenbag Road approach would provide two lanes (an exclusive through lane and an exclusive by-pass right turn lane-yield controlled), and the southbound Mississippi Avenue would provide one lane (shared left turn/right turn).

Justification for not advancing this scenario: Results from the traffic analysis did not satisfy WVDOH's LOS C design year criteria threshold for congestion improvement. The design scenario described above was analyzed again using a different software (SIDRA INTERSECTION) and the reanalysis results showed WVDOH's LOS C design year criteria threshold was satisfied, however the queue analysis yielded inferior results compared to another option, so this scenario was not carried forward.

Greenbag Road / Dorsey Avenue / Kingwood Pike

- **4-Phase Signal with All Warranted Turn Lanes –** Updated traffic signal to add a protected / permissive eastbound / westbound left turn phase for Greenbag Road and a protect permissive northbound / southbound Kingwood Pike / Dorsey Avenue left turn phase. The lane configurations included three 3-lane approaches and one 2-lane approach.

  Justification for not advancing this scenario: Results from the traffic analysis did not satisfy WVDOH's LOS C design year criteria threshold for congestion improvement.

- **2-Lane Roundabout -** Including a combination of existing configurations, exclusive left turn lanes, shared through / right turn lanes, and a right turn operating as a channelized yield-controlled by-pass lane. The lane configurations included two 2-lane approaches and two 1-lane approaches.

  Justification for not advancing this scenario: WVDOH's LOS C design year criteria threshold for congestion improvement was satisfied, but another option that yielded similar operational results was preferable due to less roadways widening and smaller amounts of right-of-way impact.

- **Modified Roundabout -** This roundabout design scenario provided 1 circulating lane on the northern portion and 2 circulating lanes on the southern portion. Lane configurations included one 2-lane approach and three 1-lane approaches with a combination of exclusive left turn lanes, shared left turn / through / right turn lanes, and shared through / right turn lanes.

  Justification for not advancing this scenario: WVDOH's LOS C design year criteria threshold was satisfied, but the capacity analysis and queue analysis yielded inferior results compared to another option.

ROUNDABOUT SAFETY

Roundabouts were included as part of the alternatives analysis to help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to installation of a roundabout include:

- Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.
- No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they might at a traditional intersection.
- One way travel- The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibility for T-bone and head-on collisions.
- Reduces the number of conflict points – A conventional 4-way intersection has 32 points of conflict due to the different crossing and entering movements by drivers, bicyclists, and pedestrians. A roundabout has 8 points of conflict, which all conflicts occur in the same direction, reducing crash severity and likelihood of injury (Figure 2).

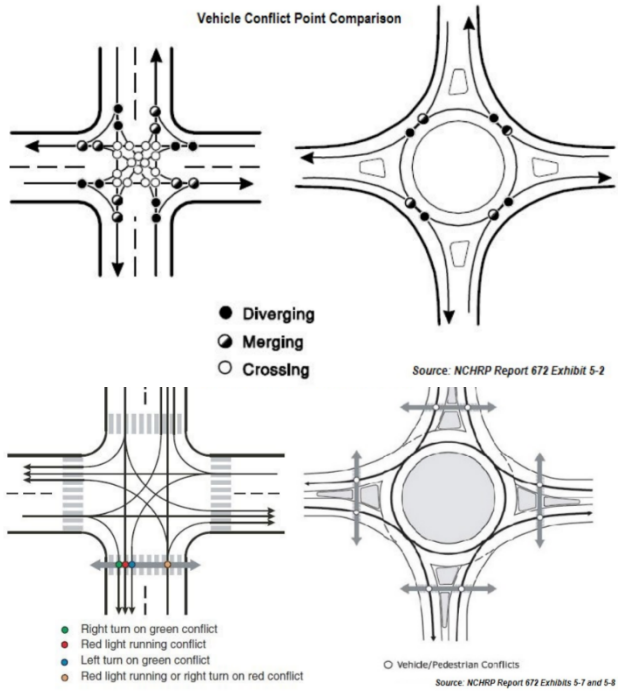


Figure 2: Vehicle and Pedestrian Conflict Points (Source: NCHRP Report 672 Exhibits 5-2, 5-7 and 5-8)

SUMMARY OF MODIFIED PREFERRED ALTERNATIVE

The EA Preferred Alternative (Alternative 2, Options C and F) (see Appendix A: Figures 3, 6, and 9 [pages 13, 16, and 19]) is the Modified Preferred Alternative (Figure 3). It includes the following design features:

- From the west end of the Project to the intersection at Mississippi Street (CR 857/1), the Greenbag Road (CR 857) roadway will be improved to incorporate two 11-foot-wide travel lanes, a 12-foot-wide center turn lane, and curb and gutter.
- The Greenbag Road (CR 857) roadway between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections will be improved to have two 12-foot-wide travel lanes, a 4-foot paved shoulder on the south side, and 3-foot paved

shoulder with a 2-foot curb and gutter and a 5-foot concrete sidewalk will be located on the north side.

- Eastbound access will be provided to Bluegrass Village via a 12-foot-wide center left turn lane.
- The area east of Jonathan Lane on Greenbag Road (CR 857) will be re-paved and undersized stormwater drainage ditches will be expanded to accommodate potential increased run-off. These improvements will be made for the section of Greenbag Road (CR 857) between Jonathan Lane and the crossing of Aaron Creek.
- Mississippi Street (CR 857/1) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- Dorsey Avenue (CR 81) will incorporate two 11-foot travel lanes with curb and gutter on both sides and a 5-foot concrete sidewalk.
- Kingwood Pike (CR 81) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- The east end of Luckey Lane (CR 81/6) will incorporate two 8-foot travel lanes with curb and gutter on both sides. The west end of Luckey Lane (CR 81/6) will include a 10-foot travel lane and a 12-foot travel lane with curb and gutter on both sides. A 5-foot concrete sidewalk will extend from Dorsey Avenue (CR 81) along Luckey Lane (CR 81/6) to connect with the sidewalk at Mountainview Elementary School.

Option C, located at the Mississippi Street (CR 857/1) intersection, includes the construction of a roundabout that provides one circulating lane on the northern portion and two circulating lanes on the southern portion.

- The eastbound Greenbag Road (CR 857) approach provides exclusive left turn and through lanes.
- The westbound Greenbag Road (CR 857) approach provides two lanes: an exclusive through lane and an exclusive right turn by-pass lane. The exclusive right turn by-pass lane does not enter the roundabout and has a yield controlled right turn lane at its intersection with Mississippi Street (CR 857/1).
- The southbound Mississippi Street (CR 857/1) approach provides one lane for the shared left turn/through movement.

Option F, located at the Dorsey Avenue/Kingwood Pike (CR 81) intersection, includes the construction of a roundabout that provides one circulating lane on the northern portion and two circulating lanes on the southern portion.

- The northbound Kingwood Pike (CR 81) provides a single lane approach for all movements.
- The southbound Dorsey Avenue (CR 81) provides a single lane approach for all movements.
- The westbound Greenbag Road (CR 857) provides a single lane approach for all movements.

- The eastbound Greenbag Road (CR 857) approach provides two lanes, an exclusive left turn lane and a shared through/right turn lane, with a yield-controlled by-pass slip lane for the right turn movement onto Kingwood Pike.

CHANGES TO THE PROPOSED DESIGN FOLLOWING APPROVAL OF THE EA

Changes that were incorporated between the EA Preferred Alternative and the Modified Preferred Alternative include drive tie-ins along Kingwood Pike, refinements of easements and right-of-way needed to complete the design, and alterations to minimize impacts to resources.

Design changes include:

- Lengthening the median islands on Greenbag Road leading into and away from the Mississippi Ave roundabout.
- Refinements of the stormwater management facilities' design
- Alterations to the design of the retaining wall along the south side of Greenbag Road east of the Kingwood Pike intersection.

Figure 3 shows the differences in proposed right-of-way for the project area and highlights the design changes after the EA was published. The areas where the proposed right-of-way was expanded or reduced between the publishing of the EA (Preferred Alternative) and this FONSI (Modified Preferred Alternative) are shown. The colors below correspond to the map figures.

Proposed ROW (*no changes* between Preferred Alternative and Modified Preferred Alternative)

Existing DOH-owned ROW

Areas of proposed ROW where impacts have been *reduced* from the Preferred Alternative to the Modified Preferred Alternative

Areas of proposed ROW where impacts have *expanded* from the Preferred Alternative to the Modified Preferred Alternative

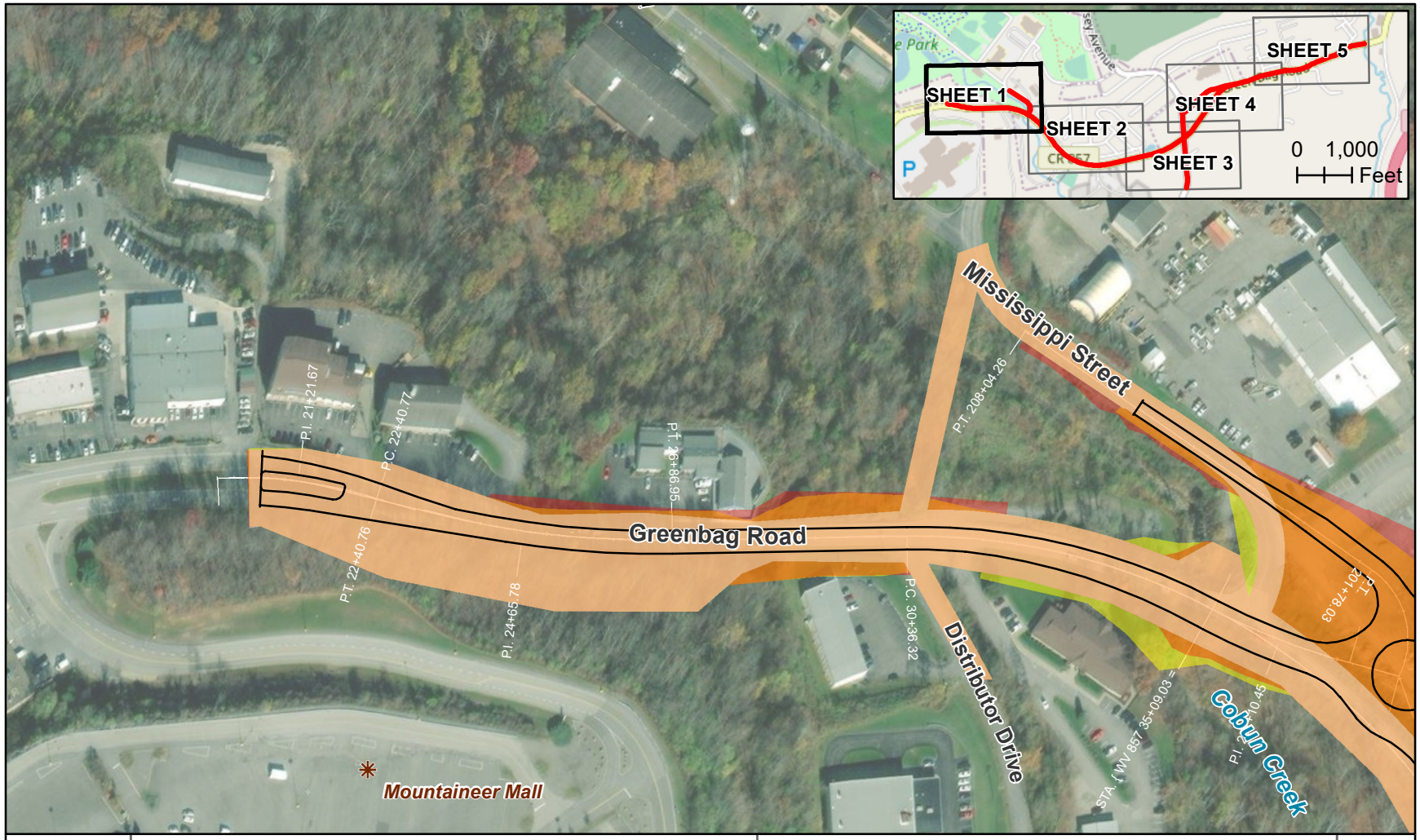


Figure 3 (Sheet 1 of 5)
Modified Preferred Alternative

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)



Figure 3 (Sheet 2 of 5)
Modified Preferred Alternative

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)

- Proposed Right-of-Way (No Change in Impacts between the EA Preferred and FONSI modified preferred Alts.)
- Existing Right-of-Way
- Proposed Right-of-Way - EA Preferred Alt. (Impact has been reduced since completion of the EA)
- Proposed Right-of-Way - FONSI Modified Preferred Alt. (Impact has expanded since completion of EA)
- Proposed Edge of Roadway (FONSI Modified Preferred Alt.)
- Point of Interest

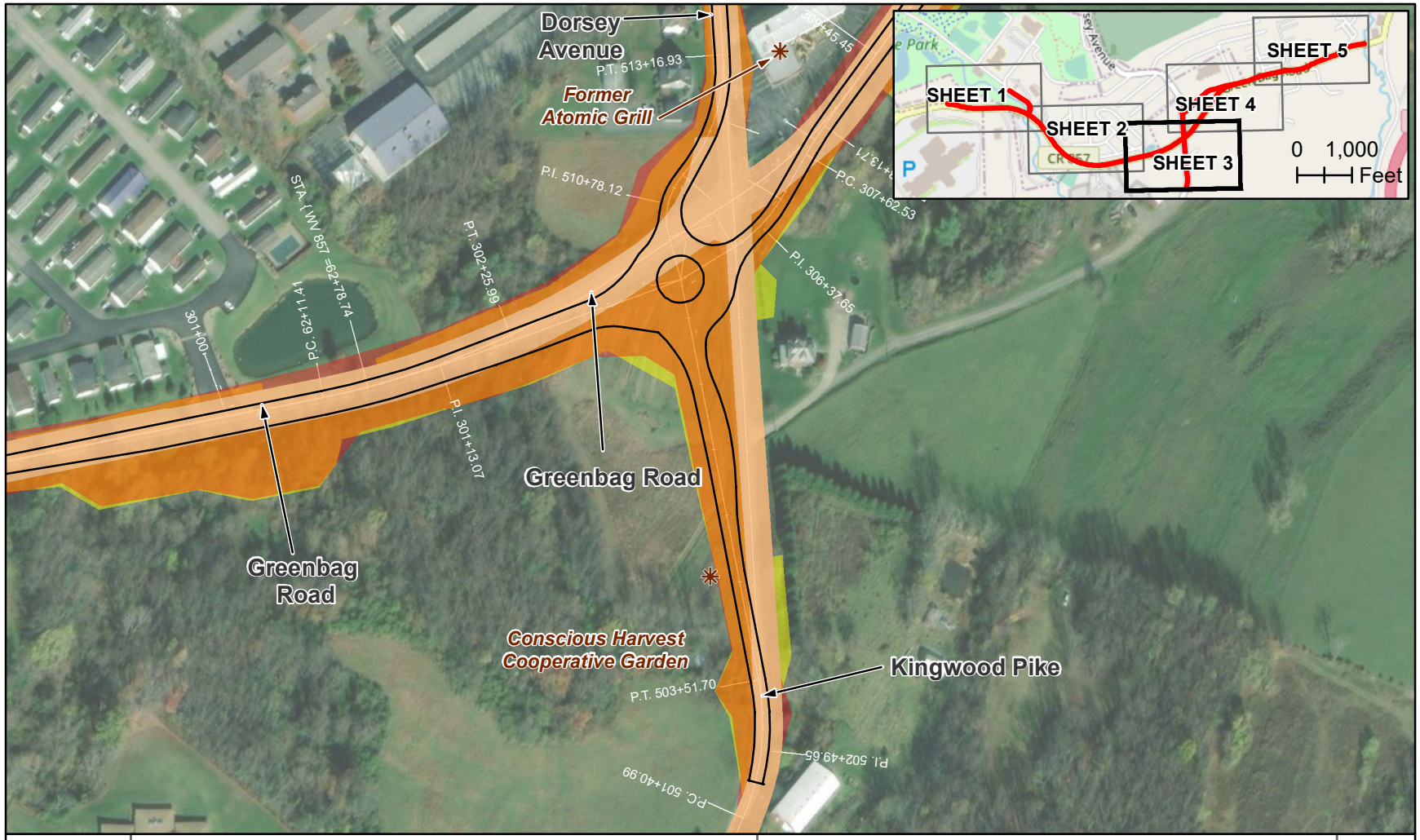


Figure 3 (Sheet 3 of 5)
Modified Preferred Alternative

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)



Figure 3 (Sheet 4 of 5)
Modified Preferred Alternative

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)

- Proposed Right-of-Way (No Change in Impacts between the EA Preferred and FONSI modified preferred Alts.)
- Existing Right-of-Way
- Proposed Right-of-Way - EA Preferred Alt. (Impact has been reduced since completion of the EA)
- Proposed Right-of-Way - FONSI Modified Preferred Alt. (Impact has expanded since completion of EA)
- Proposed Edge of Roadway (FONSI Modified Preferred Alt.)
- Point of Interest

0 125 250 500 Feet

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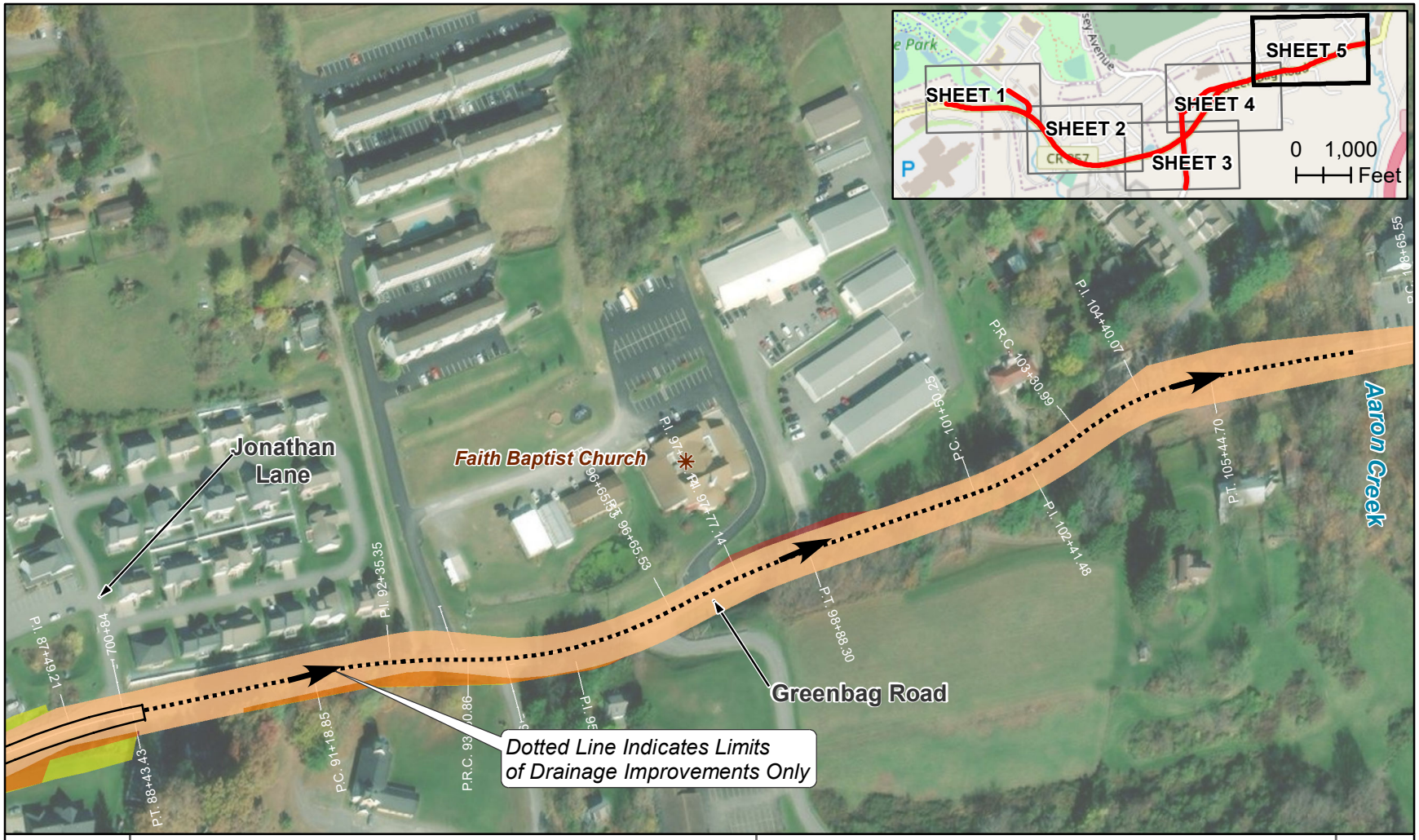


Figure 3 (Sheet 5 of 5)
Modified Preferred Alternative

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)

SUMMARY OF RESOURCE IMPACTS

In the EA, the design of the Project was compared against the existing environmental features to determine impacts within the defined Study Area. Impacts to the Study Area environmental features were determined utilizing the proposed right-of-way requirements associated with the two different build alternatives and the intersection options under consideration for the Project.

For the complete impacts analysis of both build alternatives, the no-build alternative, and the intersection options, refer to Tables 5, 6 and 7 of the EA in Appendix A:

- Table 5 (pages 41 to 52) provides a summary of the potential impacts for Alternative 1, Alternative 2 and the No-Build Alternative.
- Table 6 (pages 53 to 54) provides a summary of the impacts at the Mississippi Street Intersection Options A, B, and C.
- Table 7 (pages 55 to 56) provides a summary of the impacts at the Dorsey Avenue/Kingwood Pike Intersection Options D, E and F.

Table 1 provides a comparison of the impacts from the Preferred Alternative and the Modified Preferred Alternative. The environmental Study Area, as defined in the EA, covered the modifications to the right-of-way and no additional resource surveys were required.

Table 1: Summary of Impacts

Resource	EA Preferred Alternative	Modified Preferred Alternative
Environmental Justice	All block groups immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. While adverse impacts are anticipated under this alternative, all are expected to be minor and/or temporary and all impacts affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access.	No change

Resource	EA Preferred Alternative	Modified Preferred Alternative
Displacements	There would be no relocations for residential or commercial properties under the preferred alternative.	There would be no relocations for residential properties under the Modified Preferred Alternative. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. In addition, the WVDOH is committed to working with community partners on potential benefits for the community with enhancements or additions to a community garden organization. This work may involve undertakings such as grant programs, garden enhancements or implementations, food donation locations, or community food bank awareness programs. A proposal submitted by the Morgantown Monongalia Metropolitan Planning Organization, in conjunction with the West Virginia University Center for Resilient Communities, to develop a community garden pilot program, has been accepted by the WVDOH and FHWA. The proposal is attached as Appendix F.
Community Cohesion	The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.	No change

Resource	EA Preferred Alternative	Modified Preferred Alternative
Land Cover	The Project will impact the following land cover types: ❖ Developed land (low intensity: 1.1 acres; medium intensity: 2.6 acres; high intensity: 2.0 acres) ❖ Pasture – 0.2 acres ❖ Deciduous forest – 0.5 acres ❖ Developed open space – 0.2 acres	The Project will impact the following land cover types: ❖ Developed land (low intensity: 3.8 acres; medium intensity: 2.0 acres; high intensity: 0.7 acres) ❖ Pasture – 0.3 acres ❖ Deciduous forest – 0.6 acres ❖ Developed open space – 1.4 acres
Farmlands	This alternative will impact 5.7 acres of Farmland of Statewide Importance soil and 1.1 acres of Prime Farmland soil. Of these acres, 3.7 acres of Farmland of Statewide Importance soil and 1 acre of Prime Farmland soil have been previously developed. This alternative will result in an impact of 0.07 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.	The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the Federal Farmland Protection Policy Act (FPPA) and is therefore not subject to provisions of FPPA. This alternative will impact 5.9 acres of Farmland of Statewide Importance soil and 3.0 acres of Prime Farmland soil.
Rare, Threatened, and Endangered Species	No Impact	No change
Streams	The impacts to the streams located within this alternative are as follows: ❖ Perennial – 2,953 linear feet ❖ Intermittent – 753 linear feet The total stream impacts for this alternative are 3,706 linear feet.	The impacts to the streams located within this alternative are as follows: ❖ Perennial – 1,229 linear feet ❖ Intermittent – 947 linear feet The total stream impacts for this alternative are 2,177 linear feet.
Wetlands	Three wetlands will be impacted by this alternative. The impacts to the wetlands located within the Project area are as follows: ❖ Palustrine Emergent (PEM) – 0.06 acres ❖ Palustrine Forested (PFO) – 0.04 acres The total wetland impacts for this alternative are 0.1 acres.	Five wetlands will be impacted by this alternative. The impacts to the wetlands located within the Project area are as follows: ❖ Palustrine Emergent – 0.09 ❖ Palustrine Forested – 0.07 acres The total wetland impacts for this alternative are 0.16 acres.
Floodplains	The alternative will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.	The alternative will impact a total of 1.4 acres defined as regulated floodplain at the Cobun Creek crossing.

Resource	EA Preferred Alternative	Modified Preferred Alternative
Groundwater	No Impact	No change
Air Quality	No Impact	No change
Noise	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts is required.	No change
Potentially Hazardous Waste	The Morgantown City Garage has been identified as an area of concern. The WVDOH has committed to completing a Phase I Environmental Site Assessment for the Project area once right-of-way impacts to the property are defined. The results of that assessment will be documented in the FONSI.	The Phase I Environmental Site Assessment (ESA) will be completed for the Modified Preferred Alternative after right-of-way impacts are defined.
Historic Resources	No Adverse Effect	No change
Archaeological Resources	No Effect	No change
Utilities	Several utility lines and associated components will be relocated.	No change
Section 4(f) Resources	No use of Section 4(f) resources.	No change
Temporary Construction Impacts	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

Resource	EA Preferred Alternative	Modified Preferred Alternative
Indirect and Cumulative Impacts	The combined effects of this Project when considered in the context of other past, present, and future actions, and the resulting impacts on the human and natural features within the Secondary and Cumulative Effects study area, will likely minimally contribute to cumulative impacts to environmental resources in the Secondary and Cumulative Effects study area.	No change

AFFECTED ENVIRONMENT AND MITIGATION

The sections below identify the probable impacts of the project to the resources, changes to those impacts due to design refinements made after the EA was approved by FHWA, and proposed mitigation efforts and strategies to address the potential impacts from the Modified Preferred Alternative to these resources, where appropriate.

Environmental Justice

No changes in impacts to environmental justice (EJ) have occurred since the approval of the EA. All block groups (BGs) immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. Please note that Census Tract (CT) 109.02, BG 2 is reported in the EJ analysis summary and tables and does not contain a notable presence of EJ populations, but this BG is not located immediately adjacent to the project or in an area that will experience direct impacts. It was included in the analysis because it is within a 0.5-mile buffer of the project.

Since all BGs immediately adjacent to the Project meet thresholds indicating a presence of EJ populations, any impact resulting from the project holds the potential to be an EJ impact. However, all impacts are anticipated to be minor and/or temporary, and will affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access. No residential relocations will be required.

In comments provided as part of the EA review process, the U.S. Environmental Protection Agency (EPA) suggested that the EJ benchmarks be more clearly defined and whether there were populations of concern that had been missed in the assessment (Tables 2, 3, and 4 of the EA). The text on page 29, paragraph 2 is “A block group was considered to include a notable population for a given category if the population percentage exceeded those demonstrated in West Virginia, Monongalia County, and Morgantown.” The benchmark was defined based on the demographic findings of the reference geographies (West Virginia, Monongalia County, and Morgantown). A BG met EJ thresholds and was discussed in more detail when the proportion of either of the following exceeded that demonstrated in all three reference geographies:

- the % of population in the BG comprised of Minority (the total of all Minority groups),
- the % of population in the BG comprised of Hispanic / Latino (alone),
- the % of population comprised of Low-Income populations.

Low-Income populations were identified based on income in the past 12 months below poverty level, as reported by the U.S. Census Bureau (USCB).

Within Table 2 of the EA, there was one cell misidentified. The cell for Black or African American Alone in CT 110 BG 1 should not have been shaded.

Changes within the footnotes of Table 2 were made for additional clarity on how the results presented in the Table informed the EJ Analysis. Footnote 4 was expanded with the following text "(calculated by subtracting Total Non-Minority from the Total Population as a conservative estimate)." Footnote 5 was added and states "The results of this row were used to identify the BGs with a notable Minority Population presence. Additional data for individual race categories is also presented in the italicized rows in the bottom half of the table. This data is accounted for in the Total Minority values."

Table 4 was also revised to indicate that the Overall Study Area met thresholds for a notable population of Hispanic or Latino presence. This was indicated in the text of the EA and in Table 2, but omitted from Table 4.

The revised Tables 2 and 4 from the EA are included below with the altered cells outlined in red.

Table 2: EA Table 2 Greenbag Road Improvement Project Minority, Hispanic, or Latino Populations within the EJ Study Area

	West Virginia	Monongalia County	Morgantown	Study Area						
				Overall[1]	CT 109.02, BG 2	CT 109.02, BG 3	CT 109.02, BG 4	CT 110, BG 1	CT 110, BG 2	CT 110, BG 3
Total Population[2]	1,836,843	103,715	75,028	7,813	823	1,328	896	1,561	1,142	2,063
Total Non-Minority	1,687,570 91.9%	91,130 87.9%	63,700 84.9%	6,320 80.9%	766 93.1%	1,225 92.2%	727 81.1%	1,209 77.5%	1,056 92.5%	1,337 64.8%
Total Minority[3,4,5]	149,273 8.1%	12,585 12.1%	11,328 15.1%	1,493 19.1%	57 6.9%	103 7.8	169 18.9%	352 22.5%	86 7.5%	726 35.2%
Total Hispanic or Latino	27,021 1.5%	2,161 2.1%	1,908 2.5%	327 4.2%	0 0.0%	77 5.8%	17 1.9%	90 5.8%	36 3.2%	107 5.2%
Non-Hispanic or Latino Minority[6]	114,935 6.3%	9,947 9.6%	8,975 12.0%	1,092 14.0%	57 6.9%	26 2.0%	152 17.0%	224 14.3%	50 4.4%	583 28.3%
Black or African American Alone	65,300 3.6%	3,850 3.7%	3,355 4.5%	553 7.1%	0 0.0%	12 0.9%	62 6.9%	63 4.0%	12 1.1%	404 19.6%
American Indian and Alaskan Native Alone	3,322 0.2%	127 0.1%	75 0.1%	15 0.2%	7 0.9%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	8 0.4%
Asian Alone	14,096 0.8%	3,433 3.3%	3,386 4.5%	52 0.7%	10 1.2%	0 0.0%	0 0.0%	0 0.0%	25 2.2%	17 0.8%
Native Hawaiian and Other Pacific Islander Alone	541 0.0%	0 0.0%	0 0.0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Some Other Race	7,193 0.4%	604 0.6%	604 0.8%	18 0.2%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	18 0.9%
Two or More Races	31,800 1.7%	2,410 2.3%	2,000 2.7%	528 6.8%	40 4.9%	14 1.1%	90 10.0%	199 12.7%	13 1.1%	172 8.3%

Source: USCB 2017

[1] Combined values for Block Groups within the EJ Study Area.

[2] Total population comprises Total Non-Minority and Total Minority Populations.

[3] Minority is defined as all races/ethnicity groups except Non-Hispanic or Latino White alone.

[4] Total Minority is the Total Hispanic or Latino and Non-Hispanic or Latino Minority combined (calculated by subtracting Total Non-Minority from the Total Population as a conservative estimate).

[5] The results of this row were used to identify the BGs with a notable Minority Population presence. Additional data for individual race categories is also presented in the italicized rows in the bottom half of the table. This data is accounted for in the Total Minority values.

[6] Non-Hispanic or Latino Minority is defined as all Non-Hispanic or Latino races except for non-Hispanic or Latino White alone.

Table 3: EA Table 4 Demographic Analysis

Block Group	Minority	Hispanic or Latino	Low Income
CT 109.02, BG 2			
CT 109.02, BG 3		X	
CT 109.02, BG 4	X		
CT 110, BG 1	X	X	X
CT 110, BG 2		X	
CT 110, BG 3	X	X	
Overall	X	X	

Displacements

There will be no relocations for residential properties under the Modified Preferred Alternative.

Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. In addition, the WVDOH is committed to working with community partners on potential benefits for the community with enhancements or additions to a community garden organization. This work may involve undertakings such as grant programs, garden enhancements or implementations, food donation locations, or community food bank awareness programs. A proposal submitted by the Morgantown Monongalia Metropolitan Planning Organization, in conjunction with the West Virginia University Center for Resilient Communities, to develop a community garden pilot program, has been accepted by the WVDOH and FHWA. The proposal is attached as Appendix F.

In Table 7 of the EA, the impacts for Option E were listed incorrectly. The corrected text is presented below.

Table 4: Displacement Impacts for Option E

	Existing Text	Corrected Text
Option E	Three residences would require relocation with this intersection option	Two residences and one business would require relocation with this intersection option.

Community Cohesion

No changes in impacts to community cohesion have occurred since the approval of the EA. The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.

Land Cover

The Modified Preferred Alternative has changed the impacts to the land cover types. Impacts have been reduced to several land cover types and expanded for others. See the table below for the acreage of impacts of the Modified Preferred Alternative.

Table 5: Land Cover Impacts

Land Cover Type	EA Preferred Alternative	Modified Preferred Alternative
Developed land – low intensity	1.1	**3.8**
Developed land – medium intensity	2.6	2.0
Developed land – high intensity	2.0	0.7
Developed land – open space	0.2	**0.3**
Pasture	0.2	**0.3**
Deciduous forest	0.5	**0.6**

Farmlands

The EA reported impacts to FPPA soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Based on the definitions "Farmland ''committed to urban development or water storage'' includes all such land that receives a combined score of 160 points or less from the land evaluation and site assessment criteria."

Consultation with the Natural Resources Conservation Service (NRCS) included the assessment of the project on a Farmland Conversion Impact Rating (CPA-106) form, designated for use in linear corridor projects. The environmental study area was used to define the corridor for evaluation and all alternatives are contained within this corridor. The NRCS assessment rated the value of the Farmland to be Serviced or Converted at 5 out of 100 points. The Corridor Assessment Criteria rating was 60 out of 160 points for a Total combined score of 65 points. Lands that receive a combined score of less than 160 points are not covered by the FPPA (see 7 CFR § 658.4 - Guidelines for use of criteria) and need not be given further consideration for protection and no additional sites need to be evaluated.

Land Evaluation and Site Assessment (LESA) criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. The NRCS review using CPA-106 assigned a corridor assessment value of less than 160 points indicating that further review or mitigation measures are not required. Therefore, the LESA is not applicable to this project.

The US Census Bureau Map, correspondence with the NRCS in West Virginia, and the completed CPA-106 form are attached to this document as Appendix D.

Rare, Threatened, and Endangered Species

No changes in impacts to rare, threatened and endangered species have occurred since the approval of the EA. The West Virginia Division of Natural Resources (WVDNR) reviewed the Project area and requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The US Fish and Wildlife Service (USFWS) reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required."

Streams

Overall impacts to streams have decreased since approval of the EA. An aquatic resource investigation was completed in 2019 to identify and classify surface waters within the Project study area as either intermittent or perennial according to the definitions set forth in Title 46 and the West Virginia Surface Mining Rules. The Project area is located within the Monongahela watershed and the streams impacted include Cobun Creek and Unnamed Tributaries to Cobun Creek and Aaron Creek. Impacts will be the result of roadway widening and the replacement or extension of drainage ditches, drainage pipes, and culverts.

Changes from the EA to the Modified Preferred Alternative resulted from refinements of the design. The impacts to the streams located within this alternative are shown below.

Table 6: Stream Impacts

Stream Type	EA Preferred Alternative	Modified Preferred Alternative
Perennial	2,953 linear feet	1,229 linear feet
Intermittent	753 linear feet	**947 linear feet**
Total	3,706 linear feet	2,117 linear feet

A West Virginia Department of Environmental Protection (WVDEP)-approved Erosion and Sedimentation Control Plan will be implemented to minimize impacts to water quality in streams within the project area.

The Modified Preferred Alternative does not impact any Wild and Scenic Rivers.

Wetlands

Impacts to wetland resources have increased since the approval of the EA for both Palustrine Emergent and Palustrine Forested wetlands. The aquatic resource investigation was completed in 2019. The wetland identification and delineation investigation was conducted in accordance with the methodology described in the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual and the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The investigation identified eight palustrine wetlands within the study area covering an area of 1.2 acres. Estimated impacts are listed in the table below.

Table 7: Wetland Impacts

Wetland Type	EA Preferred Alternative	Modified Preferred Alternative
PEM	0.06 acres	**0.09 acres**
PFO	0.04 acres	**0.07 acres**
Total	0.10 acres	**0.16 acres**

Impacts will be further refined after the USACE and WVDEP have issued a preliminary jurisdictional determination and final design plans have been developed and will be reported in the USACE and WVDEP Clean Water Act Section 404/401 permit application package.

Floodplains

Overall impacts to the regulated 100-year floodplain of Cobun Creek have increased from 1.3 acres to 1.4 acres. The increase in impact is due to the lengthening of the median islands on Greenbag Road leading into and away from the Mississippi Ave roundabout. The WVDOH will apply for a Monongalia County floodplain permit prior to any construction activities. During final design, measures to avoid and minimize impacts to floodplains will be identified.

Groundwater

No changes in impacts to groundwater have occurred since the approval of the EA. Aquifers are at a sufficient depth to be protected from Project construction. The full Project area is supplied by public water service.

Air Quality

No changes in impacts to air quality have occurred since the approval of the EA. Monongalia County is in attainment with National Ambient Air Quality Standards for all criteria pollutants and is not listed in the transportation conformity plan for West Virginia. The Project is exempt under the Clean Air Act (CAA) conformity rule under *40 CFR 93.126* and from project-level and Regional Conformity analysis.

During construction, the Modified Preferred Alternative will cause a short-term increase in dust and emissions from heavy construction equipment. Dust and exhaust particulate emissions from heavy equipment operations will temporarily degrade air quality in the immediate construction zone. Contractors will be responsible for maintaining, repairing, and adjusting all construction equipment to minimize pollutant emissions. Equipment emissions may be reduced by using newer, lower-emitting equipment, retrofitting older equipment engines, and controlling activity.

Normal operations of the roadway after construction are anticipated to provide a benefit to air quality due to the improved traffic flow resulting in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersections.

Noise

No changes in impacts to noise have occurred since the approval of the EA. The noise analysis report completed in 2019 indicated the Modified Preferred Alternative does not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts was required.

Noise generating construction activities such as pile driving or jack hammering should be minimized and completed during daytime activities. Mufflers will be installed on equipment to minimize temporary noise impacts during construction. The permanent condition of the existing noise environment is not anticipated to change following construction.

Potentially Hazardous Waste

The Morgantown City Garage was identified as an area of concern within the project area. The Phase I Environmental Site Assessment will be completed for the resources that were identified within the Project area once right-of way impacts to the property are defined. In the EA, it was stated that the results the Phase I Assessment would be documented in the FONSI. However, the NEPA process must be completed prior to the right-of-way process. Therefore, the Phase I Environmental Site Assessment will be completed during the right-of-way acquisition phase of the project.

Historic Resources
As identified in the EA, there are no historical resources adversely effected by the proposed project.

Archaeological Resources
As identified in the EA, there are no archaeological resources effected by the proposed project.

Utilities
No changes in impacts to utilities have occurred since the approval of the EA. Electric, gas, sewer, and water lines are identified within the Project corridor. Several utility lines and associated components will be relocated. Coordination with utility operators will be required. The WVDOH has detailed procedures for coordinating with impacted utilities and the relocations will be completed prior to construction with limited inconvenience to the public.

Section 4(f) Resources
No changes in impacts to Section 4(f) resources have occurred since the approval of the EA. Two National Register of Historic Places-eligible resources were identified within the Project vicinity: the Campbell Farmhouse and the FCI Morgantown facility.

The Campbell Farmhouse will not have direct impacts to the property.

There will be no right-of-way acquired from the FCI Morgantown facility, thereby resulting in No Use of the Section 4(f) resource.

Temporary Construction Impacts
Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.

Indirect and Cumulative Impacts
No changes to indirect and cumulative impacts have occurred since the approval of the EA. The combined effects of this Project when considered in the context of other past, present, and future actions, and the resulting impacts on the human and natural features within the Secondary and Cumulative Effects study area, will likely minimally contribute to cumulative impacts to environmental resources in the Secondary and Cumulative Effects study area. Direct impacts by WVDOH projects will be addressed by avoidance, minimization, or mitigation consistent with programmatic agreements with the respective resource agencies during the permitting process. All developments will be required to follow local, state, and federal guidelines and permitting regulations.

SUMMARY OF IMPACTS AND MITIGATION FOR THE MODIFIED PREFERRED ALTERNATIVE

Impacts from the implementation of the Preferred Alternative and mitigation commitments are summarized in Table 8. Additional mitigation commitments will be developed during final design and permitting.

Table 8: Impacts and Mitigation Commitments

Resource or Elements	Impact	Mitigation Commitment
Environmental Justice	Impacts include right-of-way takes, parking impacts to facilities, tree removal, and access during construction.	The WVDOH will stipulate in the final design specifications the replacement of trees in kind between Bluegrass Village and the roadway after construction has been completed. All potentially affected members of the public, both EJ and non-EJ, have been afforded the opportunity to comment through public involvement activities. If significant design changes occur through final design that require reevaluation, representatives of WVDOH will continue to coordinate with the public, the City of Morgantown, and Monongalia County to involve these stakeholders in the transportation decision-making process.
Land Cover	The Modified Preferred Alternative will convert approximately 0.9 acres of undeveloped land to highway use.	Prior to earth disturbing activities, an approved Erosion and Sediment Pollution Control Plan and appropriate best management practices (BMPs) will be implemented/installed to avoid unintentional impacts to resources beyond the proposed limits of construction. This will also minimize potential impacts to water quality and stream habitat throughout the Project area. Disturbed areas will be revegetated with a native seed mixture after construction. Furthermore, the limits of construction for the Project have been reduced to the greatest extent possible while still meeting the Project Purpose and Need.
Streams	The Modified Preferred Alternative will impact a total of 2,117 linear feet of streams. Impacts will be the result of roadway widening and the replacement or extension of drainage ditches, drainage pipes, and culverts.	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific BMPs will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary.
Rare, Threatened, and Endangered (RTE) Species	In channel work in Cobun Creek	If in channel work is set to occur in Cobun Creek between April 1 and June 30, the WVDOH will request a spawning waiver from the WVDNR.

Resource or Elements	Impact	Mitigation Commitment
Wetlands	The Modified Preferred Alternative will impact five wetlands resulting in an impact of 0.16 acres. Most of the impact wetlands are identified as PEM.	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to jurisdictional wetlands. If necessary, unavoidable impacts will be mitigated through the purchase of appropriate wetland banking credits or payments to the state's in-lieu fee program.
Floodplains	The Modified Preferred Alternative will impact a total of 1.4 acres defined as regulated floodplain at the Cobun Creek crossing.	During final design, measures will be identified to minimize and avoid impacts to floodplains. The WVDOH will apply for a Monongalia County Floodplain permit prior to any construction.
Noise	Sound levels may be temporarily increased during construction.	Noise generating construction activities such as pile driving or jack hammering should be minimized and completed during daytime activities. Mufflers will be installed on equipment to minimize temporary noise impacts during construction. The permanent condition of the existing noise environment is not anticipated to change following construction.
Utilities	Utility relocations will be required as a result of the Project.	Coordination with utility operators will be required. The WVDOH has detailed procedures for coordinating with impacted utilities and the relocations will be completed prior to construction with limited inconvenience to the public.
Potentially Hazardous Waste	The Morgantown City Garage is an area of concern. Exact impacts will be defined upon completion of the Phase I Environmental Site Assessment.	To be determined upon completion of the Phase I Environmental Site Assessment
Temporary Construction Impacts	Construction will create short-term impacts related to increased noise and air pollution, erosion, and traffic delays or detours.	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property.

PUBLIC PARTICIPATION AND AGENCY COORDINATION

The WVDOH hosted a virtual public meeting informational workshop to present the FHWA approved EA and receive comments for the proposed Greenbag Road Improvement Project. The project proposes improvements and upgrades to the Greenbag Road (CR 857) corridor between Jonathan Lane and ¼ mile west of the intersection with Mississippi Street. Previously, an in-person public meeting was held at South Middle School on April 16, 2019 from 4 to 7 pm. A summary of that meeting is available as an attachment to the EA.

The second meeting was held virtually on the publicinput.com meeting platform on September 29, 2020 from 5:00 to 8:00 PM. The meeting was available through the website or through a call in number. The decision to hold the meeting virtually was in response to the COVID-19 pandemic.

A 30-day comment period followed the public meeting, with comments due to WVDOH by October 29, 2020. Due to the number of comments received and the intensity of public involvement, FHWA extended the comment period for an additional 30 days, ending on November 30, 2020 for a total public comment period of 60 days.

Distribution of the Approved Environmental Assessment

Federal, state, and local agencies with jurisdiction over transportation projects and relevant environmental regulations received a copy of the EA to review. The WV State Senators and Delegates representing the Project area also received a copy for review. All entities that received a copy in September 2020 are presented below.

Federal Agencies

Samantha Beers, Director
Office of Community,
Tribes, & Environmental Assessment
U.S. Environmental Protection Agency
Region III (3RA10)
1650 Arch St.
Philadelphia, PA 19103

Michael E. Hatten
Chief Regulatory Division
U.S. Army Corps of Engineers
Huntington District
CELRH-RD
502 Eighth Street
Huntington, WV 25701-2070

Elizabeth Stout
U.S. Fish and Wildlife Service
West Virginia Field Office
694 Beverly Pike
Elkins, WV 26241

Willie R. Taylor
Director, Office of Environmental
Policy and Compliance
U.S. Department of Interior
1849 C. Street, NW (MS2462)
Washington, D.C. 20240

Mary Ann Tierney
Regional Administrator
Federal Emergency Management Agency
Region III
615 Chestnut Street
Philadelphia, PA 19106

Environmental Coordinator
United States Department of Agriculture
Natural Resources Conservation Service
1150 Earl L. Core Road, Suite 200
Morgantown, WV 26505

West Virginia Agencies

Brian Bridgewater
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WV Department of Environmental Protection
601 57th Street
Charleston, WV 25304-2345

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D-4 District Manager/Engineer
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I-79 & Meadowbrook Road
Clarksburg, WV 26302-2570

Danny Bennett
West Virginia Division of Natural Resources
P.O. Box 67
Elkins, WV 26241

Stephen S. McDaniel, Director
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324 Fourth Avenue
South Charleston, WV 25303

Susan Pierce
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1900 Kanawha Blvd East
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William F. Durham
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West Virginia Department of
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601 57th Street, SE
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Austin Caperton, Cabinet Secretary
West Virginia Department of
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Scott G. Mandirola
Director, Division of Water
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Senators & Delegates

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State Capitol Complex
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Barbara Evans Fleischauer
Member of the WV House of Delegates
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State Capitol Complex
Charleston, WV 25305

Robert Beach
Member of the WV Senate
Room 204W, Building 1
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Evan Hansen
Member of the WV House of Delegates
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Rennetta McClure
County Administrator
Monongalia County Commission
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Tribes

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Agency Comments

Following the distribution of the EA, comments were received from the EPA, the WVDNR, and the NRCS. The agency comments and the WVDOH responses to comments are listed below. The agency correspondence for the EPA and the WVDNR is included in Appendix E. The NRCS correspondence is included in Appendix D.

Environmental Protection Agency

Comment: We recommend the EA clarify how pedestrian/bike traffic will flow in the project area and navigate the proposed roundabout.

Response: The plansheets show the sidewalk on the north side of Greenbag Road extending from the beginning of the project area at Station 20+66 and extending along Greenbag Road to the roundabout at the Dorsey Avenue intersection. At this point the sidewalk meets a crosswalk to allow pedestrians and cyclists to cross Dorsey Avenue, then continues north along Dorsey Avenue to a crosswalk at Luckey Lane. The sidewalk extends along the north side of Luckey Lane until it joins with the existing sidewalk at Mountainview Elementary

School. Both roundabouts provide crosswalks with pedestrian islands to cross the vehicular travel lanes.

Comment: The EA would benefit from data and explanation of safety advantages with the proposed roundabout design.

Response: Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to installation of a roundabout include:

- *Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.*
- *No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they might at a traditional intersection.*
- *One way travel- The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibility for T-bone and head-on collisions.*
- *Reduces the number of conflict points – A conventional 4-way intersection has 32 points of conflict due to the different crossing and entering movements by drivers, bicyclists, and pedestrians. A roundabout has 8 points of conflict, which all conflicts occur in the same direction, reducing crash severity and likelihood of injury. See Figure 2 above.*
- *In addition, roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Unlike a traffic signal-controlled intersection, drivers would not have to wait for a green light at a roundabout to get through the intersection. Traffic is not required to stop at a roundabout, only yield, which increases the amount of traffic through the intersection in the same amount of time.*

Comment: It is suggested that the EA provide additional information with consideration to the Alternatives requiring traffic lights (enforceable with traffic cameras) and expanded access to bicycle, electric vehicles (for the handicap) and pedestrian usage.

Response: The alternatives analysis in the EA, beginning on page 9, considers Intersection Options A, D, and E which all feature the use of traffic lights. All alternatives considered include the addition of a sidewalk and expanded roadway shoulders for bicycle, electric vehicles (for the handicap) and pedestrian usage.

Comment: We suggest the EA describe the potential increased stormwater impacts and discuss in more detail how stormwater from the existing road and proposed project will be managed. Opportunities to address storm water impacts by pursuing off-site BMPs in the upper watersheds of the proposed project may be available, as well as locations within the project area.

Response: WVDOH will follow DD-506 for stormwater management and will require the contractor to obtain the appropriate NPDES and MS4 permits prior to construction. Those permits will include BMPs and stormwater management plans. The stormwater management plan is anticipated to meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The

amount of offsite runoff to these facilities is minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design will be completed during final design.

Comment: We recommend a robust public coordination program throughout construction that includes, but is not limited to, communicating detours and traffic disruptions. We also recommend avoiding and/or minimizing construction impacts including, but not limited to, light, noise, dust, and time of construction work.

Response: WVDOH followed DD-201 for public involvement, and all NEPA requirements were met. One public meeting was held in Morgantown at the South Middle School on April 16, 2019. A second public meeting was held virtually using the Public Input online platform on September 29, 2020. The comment period following the September 29 meeting was 60 days.

Comment: We suggest the EA describe the community impacts as a result of the completed preferred alternative. For example, will the completed project impact residents by having increased truck traffic, more lighting, fewer buffers from road, etc? The EA mentions concerns residents have about tree removal and lighting being added.

Response: Community impacts based on the preferred alternative were assessed in the EA, see Table 11: Summary of Impacts from the Preferred Alternative (2 / C / F). Public comments were recorded during the first public meeting which concerned the potential for tree removal at Bluegrass Village. The Preferred Alternative does not include the removal of any of the evergreen trees at Bluegrass Village. If the contractor deems it necessary to remove or damage any of these trees, they will be replaced in kind.

Comment: The EA should include Executive Order (E.O.) 13045 - Protection of Children from Environmental Health Risks and Safety Risks.

Response: Contractors would be responsible for maintaining, repairing, and adjusting all construction equipment to minimize pollutant emissions.

Comment: It is noted that there are a number of Title VI Resources listed in the document. But it is unclear if they are recipients of Federal Funds. Please explain their status in the EA.

Response: The project is a recipient of Federal funds, therefore the EA included an assessment of Title VI resources. See page 33 of the main body of the EA document. The resources were detailed in the EA to demonstrate the area was reviewed and potential impacts to the Title IV resources were considered. Federal funding status was not evaluated as none of these resources will have significantly adverse and disproportionate impacts.

Comment: The Environmental Justice (EJ) benchmarks should be clearly defined. It may be helpful, for example to select the state average as the benchmark value, or the lowest benchmarking value for each of the criteria as a way of making the benchmarking process clear and consistent.

Response: The benchmark was defined as the reference geographies (state, county, and city) where any category exceeding all three of the reference geographies was identified as an EJ population. The text on page 29, paragraph 2 is "A block group was considered to include a notable population for a given category if the population percentage exceeded those demonstrated in West Virginia, Monongalia County, and Morgantown."

Using the 10 percentage point benchmark for the state average as a benchmark does not change any of the assessments of the individual block groups.

All block groups adjacent to the project area are identified as EJ populations within the text of the document and were considered for the impacts analysis. This information was verified through the use of the EPA EJ screen tool.

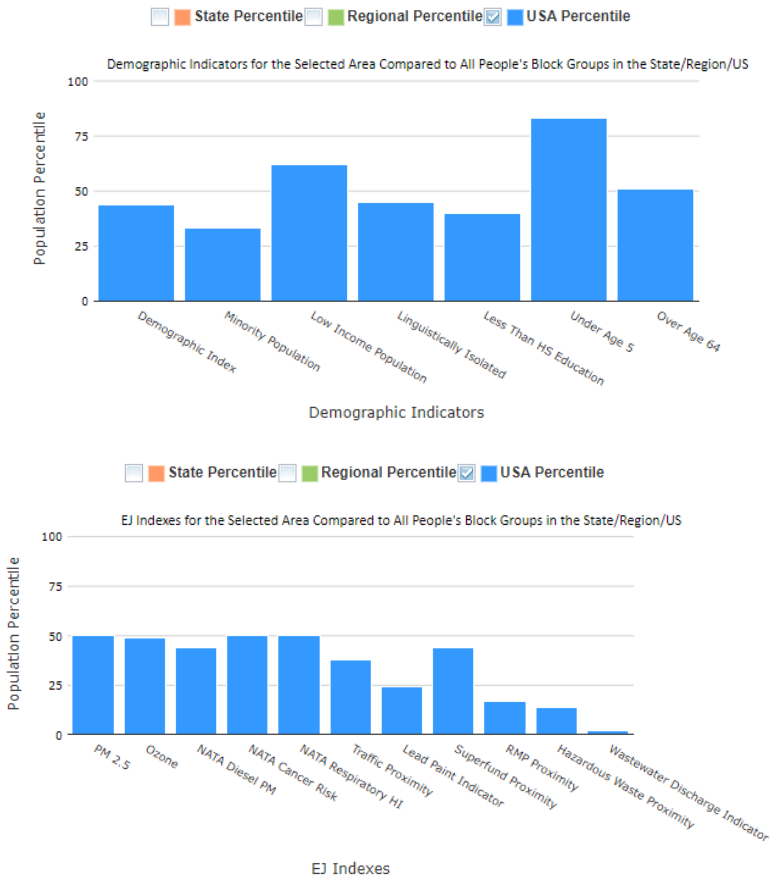


Figure 4: Demographic Indicators and EJ Indexes (Source EPA EJ Screen Tool)

Comment: There appear to be populations of concern that are missed in the assessment. Tables 2, 3 and 4 should be revised to reflect this consideration. It appears that all six block groups are of potential EJ concern. EPA would be pleased to discuss this methodology and evaluation at your convenience.

Response: Within Table 2, there was one cell misidentified, Black or African American Along in CT 110 BG 1 should not have been shaded. The error in the table will be corrected and addressed in the FONSI.

Table 3 – Within Table 3 there were no cells misidentified based on the above defined EJ benchmark.

Table 4 – Overall Study Area should be marked as containing a notable population of Hispanic or Latino presence. The error in the table will be corrected and addressed in the FONSI.

All block groups adjacent to the project area are identified as EJ populations within the text of the document and were considered for the impacts analysis. This information was verified through the use of the EPA EJ screen tool.

Comment: We suggest that the EA evaluate potential adverse impacts to resources, from past, current and foreseeable future activities. Beyond regulatory protections, it may be helpful to identify any activities or mitigative actions that may improve resource condition.

Response: Secondary and cumulative impacts are assessed in the EA (page 57) and the Secondary and Cumulative Effects Analysis Report (EA Appendix G).

Comment: The EA mentions that utilities will need to be relocated. We suggest additional discussion be provided related to impacts associated with these relocations.

Response: Utility relocations will be coordinated and completed by the respective utilities based on WVDOH DD-303.

Comment: The EA states that there will be no effect on air quality. If a beneficial effect is anticipated from reduction of truck traffic or improved non-motorized mobility, it is suggested information could be provided. Please feel free to reach out to EPA to discuss air quality assessment.

Response: To minimize and mitigate air quality impacts during the construction phase of the project, the following BMPs will be implemented:

- *Utilize appropriate dust suppression methods during on-site construction activities. Available methods include application of water, soil stabilizers, or vegetation; use of enclosures, covers, silt fences, or wheel washers; and suspension of earth-movement activities during high wind conditions;*
- *Maintain a speed of less than 15 mph with construction equipment on unpaved surfaces as well as utilize fuel with lower sulfur content;*
- *Employ a construction management plan in order to minimize interference with regular motor vehicle traffic;*
- *Use electricity from power poles instead of generators whenever possible;*
- *Repair and service construction equipment according to the regular maintenance schedule recommended for each individual equipment type;*
- *Use low-VOC architectural materials and supplies equipment; and*
- *Incorporate energy-efficient supplies whenever feasible.*

Normal operations of the roadway after construction are anticipated to provide a benefit to air quality due to the improved traffic flow resulting in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersections. This benefit will be corrected in the FONSI.

West Virginia Division of Natural Resources

In a letter dated September 28, 2020 the WVDNR concurred that the EA had adequately addressed all significant environmental issues related to wildlife resources.

NRCS FPPA letter

In a letter dated March 25, 2021, the NRCS provided a review of the project and determined that the Greenbag Road Project does impact prime or other important farmland. The review was documented on a CPA-106 form to be returned to the NRCS following completion of Parts VI and VII by the Federal Agency. The NRCS assessment rated the value of the Farmland to be Serviced or Converted at 5 out of 100 points. The Corridor Assessment Criteria rating (Part VI) was 60 out of 160 points for a Total combined score of 65 points. Lands that receive a combined score of less than 160 points are not covered by the FPPA (see 7 CFR § 658.4 - Guidelines for use of

criteria) and need not be given further consideration for protection and no additional sites need to be evaluated. See Appendix D for the correspondence and CPA-106 form.

Public Comments

The WVDOH hosted a virtual public meeting informational workshop to present the FHWA approved EA and receive comments for the proposed Greenbag Road Improvement Project. The meeting was held virtually on the publicinput.com meeting platform on September 29, 2020 from 5:00 to 8:00 PM. The meeting was available through the website or through a call in number. The decision to hold the meeting virtually was in response to the COVID-19 pandemic. A summary of the meeting and public comment period are attached to this document (see Appendix C).

Nine hundred fifty-nine (959) comments were received by WVDOH. Of these, three hundred ninety-five (395) were submitted during the public meeting. Of the total comments received, one hundred fifty-five (155 / 16.2%) were neutral to the preferred alternative design and included the answers to the WVDOH question about advertising, test comments from the presentation team, general questions, and requests for in-person meeting (15 comments). Fifty-three (53 / 5.5%) comments showed full support for the preferred alternative as presented. Seven hundred fifty comments (751 / 78.3%) expressed concerns and were not in support of the preferred alternative. Several common themes were identified throughout the comments and are listed below. Many comments referred to more than one theme meaning percentages will exceed 100% when adding all comments.

- Roundabout (389 / 40.6%)
- Turn lanes (204 / 21.3%)
- Community garden/farmland (180 / 18.8%)
- Other alternatives (120 / 12.5%)
- Road maintenance (116 / 12.1%)
- Insufficient resource studies (124 / 12.9%)
- Safety (109 / 11.4%)
- Detour (100 / 10.4%)
- Virtual public meeting format (105 / 10.9%)
- Right-of-way concerns (93 / 9.7%)
- Large vehicles (92 / 9.6%)
- Bike/pedestrian (90 / 9.4%)
- Project not needed (65 / 6.8%)
- Schedule/budget (47 / 4.9%)
- Luckey Lane (24 / 2.5%)
- Mitigation (12 / 1.3%)
- Option G/petition (8 / 0.8%)

Appendix A: Environmental Assessment

Greenbag Road Improvement Project

Environmental Assessment

Monongalia County, West Virginia

State Project: U331-857-0.67
Federal Project: STP-0857(019)D

U.S. Department of Transportation

Federal Highway Administration

West Virginia Department of Transportation

Division of Highways

August 2020

State Project Number: U331-857-0.67
Federal Project Number: STP-0857(019)D

Greenbag Road Improvement Project
Monongalia County, West Virginia

ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to 42 USC 4332(2)c by the U.S. Department of Transportation, Federal Highway Administration and the West Virginia Department of Transportation – Division of Highways

08-14-2020
DATE OF APPROVAL

FOR WEST VIRGINIA DIVISION OF HIGHWAYS

08-28-2020
DATE OF APPROVAL

FOR FEDERAL HIGHWAY ADMINISTRATION

The following persons may be contacted for additional information concerning this document.

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Comments on this Environmental Assessment are due by _____ and should be sent to:

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Executive Summary

The West Virginia Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), proposes to provide operational improvements along 1.65 miles of Greenbag Road (CR 857), located southeast of the City of Morgantown in Monongalia County. This Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor.

This Environmental Assessment (EA) is being prepared by the WVDOH in cooperation with FHWA to fulfill the requirements of the National Environmental Policy Act (NEPA).

Purpose and Need

The purpose of the Project is to provide operational improvements along Greenbag Road (CR 857) to reduce congestion and address the lack of safe non-motorized connections along the corridor.

Two traffic studies of the corridor have determined that the flow of traffic through the Greenbag Road (CR 857) corridor is controlled by the level of service (LOS) at the major intersections. These major intersections include the Mississippi Street (CR 857/1) intersection and the Dorsey Avenue/Kingwood Pike (CR 81) intersection. With the exception of southbound traffic on Mississippi Street (CR857/1), the current traffic conditions operate at LOS D, which is considered acceptable; however, expected growth in the region will negatively impact the flow of traffic and degrade the LOS at both intersections to LOS F. A summary of the LOS from the traffic study is presented in Table E-1.

Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) *Greenbag Road Corridor Study* (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access.

Public Involvement

The WVDOH hosted an initial public meeting informational workshop to inform the public and receive comments for the proposed Greenbag Road (CR 857) Improvement Project on April 16, 2019. Public comments received at the meeting and during the comment period focused primarily on the following topics:

- The use of turn lanes instead of a roundabout at the Greenbag Road (CR 857) and Dorsey Ave/Kingwood Pike (CR 81) intersection

- *Response: The intersection options that were evaluated and analyzed during the EA process include turning lanes with traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service (LOS) provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the LOS as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of two or three residences (depending on the turn lane option selected) while the roundabout design does not take any residences or businesses.*

- Impacts to the community garden
  - *Response: The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.*
- Prioritizing road repair, both locally and within the county, over improvements to the Greenbag Road (CR 857) corridor
  - *Response: Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.*
- The use of traffic signals at the intersections instead of roundabouts
  - *Response: The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. The use of traffic signals at the intersections instead of roundabouts was evaluated as part of the turn lane options. See Option A at Mississippi Street (CR 857/1) and Options D and E at Dorsey Avenue/Kingwood Pike (CR 81) for the assessment of impacts to these options.*
- Concerns related to the detour route, including length and conditions of the roadways to be used

- *Response: The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.*

❖ Requests for an Environmental Impact Statement (EIS) or Environmental Assessment instead of a Categorical Exclusion (CE)

- *Response: The environmental document for the project has been elevated from a CE to an EA by the FHWA. Based on the comments received during the first public comment period, FHWA has evaluated the project and determined that an EA is the appropriate level of documentation given the scope and details of the project. Per FHWA guidelines, the EA is a concise document that provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. The EA provides opportunity to describe and evaluate the impacts to social, cultural, natural, economic, and environmental resource factors. A second public meeting will be held to present the EA and allow additional time for review and comment by the public and agencies.*

❖ A desire to see additional alternatives presented

- *Response: The WVDOH has examined the no build alternative, two build alternatives, and three options for each of the major intersections. When considering all of the possible combinations of the two alternatives with the intersection options, there were 18 possible combinations examined.*

❖ Returning the Greenbag Road (CR 857) and Dorsey Ave/Kingwood Pike (CR 81) intersection to a 4-way stop

- *Response: A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.*

Alternatives

Two Project alternatives (Alternative 1 and Alternative 2) were developed along the proposed corridor, in addition to the No Build Alternative. Additionally, there are three possible intersection options at each of the two major intersections within the Project. The preferred alternative identified during the course of this environmental assessment utilizes Alternative 2 and intersection options C and F.

Several design features are consistent in both Build Alternatives and they are as follows:

- Mississippi Street (CR 857/1) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- Dorsey Avenue (CR 81) will incorporate two 11-foot travel lanes with curb and gutter on both sides and a 5-foot concrete sidewalk.
- Kingwood Pike (CR 81) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- The east end of Luckey Lane (CR 81/6) will incorporate two 8-foot travel lanes with curb and gutter on both sides. The west end of Luckey Lane (CR 81/6) will include a 10-foot travel lane and a 12-foot travel lane with curb and gutter on both sides. A 5-foot concrete sidewalk will extend from Dorsey Avenue (CR 81) along Luckey Lane (CR 81/6) to connect with the sidewalk at Mountainview Elementary School.
- From the west end of the Project to the intersection at Mississippi Street (CR 857/1), the Greenbag Road (CR 857) roadway will be improved to incorporate two 11-foot-wide travel lanes, a 12-foot-wide center turn lane, and curb and gutter.
- The Greenbag Road (CR 857) roadway between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections will be improved to have a 4-foot paved shoulder on the south side, and 3-foot paved shoulder with a 2-foot curb and gutter and a 5-foot concrete sidewalk will be located on the north side. The shoulder widths are sufficient to be shared with bikes.
- The area east of Jonathan Lane on Greenbag Road (CR 857) will be re-paved and undersized stormwater drainage ditches will be expanded to accommodate increased run-off. These improvements will be made for the section of Greenbag Road (CR 857) between Jonathan Lane and the crossing of Aaron Creek.

Under Alternative 1, the Greenbag Road (CR 857) roadway will be improved to incorporate two 11-foot-wide travel lanes and a 12-foot-wide continuous shared center turn lane between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections.

Under Alternative 2, the Greenbag Road (CR 857) roadway between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections, Greenbag Road (CR 857) will be improved to two 12-foot-wide travel lanes. Eastbound access will be provided to Bluegrass Village via a 12-foot-wide center left turn lane.

Mississippi Street Intersection Options Considered:

Option A includes the installation of a traffic signal.

Option B includes the construction of a roundabout.

Option C includes the construction of a roundabout with a continuous right turn lane from Greenbag Road (CR 857) to Mississippi Street (CR 857/1).

Dorsey Ave / Kingwood Pike Intersection Options Considered:

Option D includes the installation of a traffic signal

Option E includes the installation of a traffic signal with dedicated left turn lanes.

Option F includes the construction of a roundabout.

Table E-1: Summary of LOS Results from 2018 Traffic Study

	2018 Conditions		Design Year 2048							
			Mississippi Street Intersection Options			Dorsey Ave Intersection Options			No Build	
	Mississippi Street	Dorsey Ave / Kingwood Pike	A	B	C	D	E	F	Mississippi Street	Dorsey Ave / Kingwood Pike
Level of Service - morning	*C*	*C*	A	B	A	C	C	B	F	C
Level of Service - afternoon	*A*	*C*	B	A	A	E	C	C	D	F

Environmental Impacts

The design of the Project was compared against the existing environmental features observed in the Study Area through background research and field investigations. Impacts to the Study Area environmental features were determined utilizing the proposed right-of-way requirements associated with the two different build alternatives and the intersection options under consideration for the Project. Table E-2 summarizes the environmental impacts from the preferred alternative.

Table E-2: Summary of Impacts From the Preferred Alternative (2 / C / F)

Resource or Elements	Preferred Alternative 2 / C / F
Environmental Justice	All block groups immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. While adverse impacts are anticipated under this alternative, all are expected to be minor and/or temporary and all impacts affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access.
Displacements	There would be no relocations for residential or commercial properties under the preferred alternative.
Community Facilities and Services	The expanded roadway widths and turning lane will improve traffic capacity and provide for increased mobility. Vehicle travel through the corridor will be more efficient. Non-motorized access to community services will be enhanced through the presence of the sidewalks and increased roadway shoulders for bicycle use.
Community Cohesion	The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.
Farmlands	This alternative will impact 5.7 acres of Farmland of Statewide Importance soil and 1.1 acres of Prime Farmland soil. Of these acres, 3.7 acres of Farmland of Statewide Importance soil and 1 acre of Prime Farmland soil have been previously developed.
	This alternative will result in an impact of 0.07 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.
Land Cover	The Project will impact the following land cover types: ❖ Developed land (low intensity: 1.1 acres; medium intensity: 2.6 acres; high intensity: 2.0 acres) ❖ Pasture – 0.2 acres ❖ Deciduous forest – 0.5 acres ❖ Developed open space – 0.2 acres
RTE Species	No Impact

Table E-2: Summary of Impacts From the Preferred Alternative (2 / C / F) (continued)

Resource or Elements	Preferred Alternative 2 / C / F
Streams	The impacts to the streams located within this alternative are as follows: ❖ Perennial – 2,953 linear feet ❖ Intermittent – 753 linear feet The total stream impacts for this alternative are 3,706 linear feet.
Wetlands	Three wetlands will be impacted by this alternative. The impacts to the wetlands located within the Project area are as follows: ❖ Palustrine Emergent – 0.06 acres ❖ Palustrine Forested – 0.04 acres The total wetland impacts for this alternative are 0.1 acres.
Floodplains	The Project will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.
Groundwater	No Impact
Air Quality	No Impact
Noise	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts is required.
Potentially Hazardous Waste	The Morgantown City Garage has been identified as an area of concern. The WVDOH has committed to completing a Phase I Environmental Site Assessment for the Project area once right-of-way impacts to the property are defined. The results of that assessment will be documented in the FONSI.
Historic Resources	No Adverse Effect
Archaeological Resources	No Impact
Utilities	Several utility lines and associated components will be relocated.

Table E-2: Summary of Impacts From the Preferred Alternative (2 / C / F) (continued)

Resource or Elements	Preferred Alternative 2 / C / F
Section 4(f) Resources	Two NRHP-eligible resources were identified within the Project vicinity. The Campbell Farmhouse will not have direct impacts to the property. There will be no right-of-way acquired from the FCI Morgantown facility, thereby resulting in No Use of the Section 4(f) resource.
Temporary Construction Impacts	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.

Costs

Estimated construction costs were developed for both alternatives and each of the options. **Tables E-3 and E-4** below show the estimated costs for each of the alternatives with all possible combinations of the intersection options. The cost for the preferred alternative is highlighted in **Table E-4**.

Table E-3: Estimated Construction Costs for Alternative 1

		Dorsey Avenue/Kingwood Pike Intersection Options		
		D	E	F
Mississippi Street Intersection Options	A	$12,689,979.44	$13,249,895.68	$10,755,399.35
	B	$13,125,555.10	$13,685,471.34	$11,190,975.01
	C	$13,074,839.27	$13,634,755.51	$11,140,259.18

Table E-4: Estimated Construction Costs for Alternative 2

		Dorsey Avenue/Kingwood Pike Intersection Options		
		D	E	F
Mississippi Street Intersection Options	A	$11,238,152.91	$11,792,156.83	$9,842,019.50
	B	$11,642,971.91	$12,196,975.83	$10,246,838.49
	C	$11,825,328.90	$12,379,332.83	$10,429,195.49

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INTRODUCTION

The West Virginia Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), proposes to provide operational improvements along 1.65 miles of Greenbag Road (CR 857), located southeast of the City of Morgantown in Monongalia County (hereinafter referred to as, Project) (**Figure 1**). This Project is being undertaken to reduce traffic congestion and address the lack of safe *non-motorized connections* through the corridor. The project is based on a study by the Morgantown Monongalia MPO (MMMPO) Unified Working Program (FY2014-2015). The overall goal of the study was to identify ways to improve Greenbag Road (CR 857) as an alternative truck route to reduce and/or eliminate trucks from traveling through downtown Morgantown by providing a safer, continuous route from WV 7 to US 119.

The western limit of the Project occurs near the existing limits of the divided roadway near the Mountaineer Mall access. The eastern limit of the Project occurs at the existing bridge over Aaron Creek (see **Figure 1**).

The overall roadway improvements along Greenbag Road include wider lanes and shoulders along with *curb and gutter* installations to help address drainage issues and to provide a sidewalk along the entire route. In addition, the north side shoulder will be utilized as a bike lane for the corridor between the commercial area to the west and the residential areas along the corridor.

Both the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections with Greenbag Road (CR 857) are proposed to be upgraded to provide improved traffic flow along the route and to increase the safety of the traveling public at each intersection. The intersections will include lighting and will be developed to allow the safe movement of pedestrians along the sidewalk on the north side of Greenbag Road (CR 857).

Additional work will occur on Luckey Lane (CR 81/6). This work will improve the width of the travel lanes within the existing right-of-way and re-pave the length of Luckey Lane (CR 81/6) between its intersections with Greenbag Road (CR 857) and Dorsey Avenue (CR 81). From the intersection of Greenbag Road (CR 857) and Jonathan Lane to the crossing of Aaron Creek, the Project will include roadside drainage improvements as needed to address stormwater runoff.

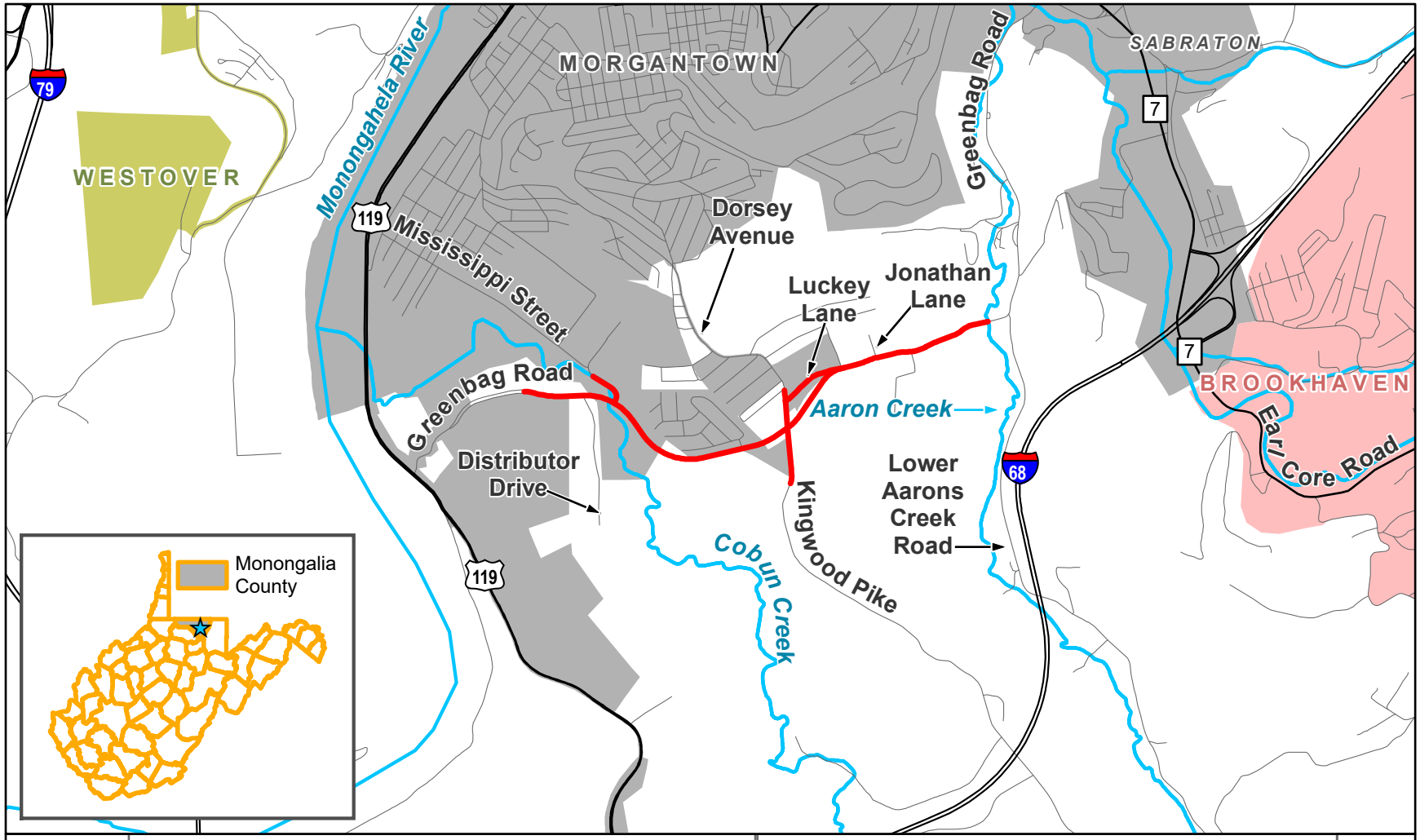


Figure 1
Project Location

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

*Data Sources: WVDO**H** (2019**a**), USGS (2017), **USCB** (2019**b**)*

This Environmental Assessment (EA) is being prepared by the WVDOH in cooperation with FHWA to fulfill the requirements of the National Environmental Policy Act (NEPA). NEPA requires that the potential for environmental impacts be assessed prior to development projects for federal actions that could significantly affect the quality of the human environment. Due to significant local interest in the Project, the preparation of an EA document is appropriate to assess the significance of impacts.

A **glossary** of some industry and project specific terminology used throughout this document is available for reference on page 80. Words included in the glossary are in italics throughout the document. A list of **acronyms** used throughout this document is included on page 83.

HOW HAS THE PUBLIC BEEN INVOLVED IN THE PROJECT?

The WVDOH hosted a public meeting informational workshop to inform the public and receive comments for the proposed Greenbag Road (CR 857) Improvement Project. The meeting was held at the South Middle School at 500 East Parkway Drive in Morgantown, West Virginia on April 16, 2019 (**Image 1**). The public was informed of the meeting date and location through advertisements in the *Dominion Post* (2019) and through hand-delivered flyers to the surrounding community residents and businesses. The MMMPO and the City of Morgantown posted notices of the meeting online on their respective websites and social media pages.



Image 1: South Middle School

At the meeting, handouts with information on the proposed Project were provided at the registration table. All information presented in the meeting was also available online at the WVDOH website at http://go.wv.gov/dotcomment.

A 30-day comment period followed the public meeting, with comments due to the WVDOH by May 16, 2019. Comment forms were attached to the handouts at the meeting and were available online, before the meeting and during the

comment period, on the WVDOH website. Given the volume of public response the comment period was extended to May 21, 2019 in order to capture all of the submitted responses.

Fifty-two (52) individuals signed the attendance sheet at the public meeting. However, two hundred sixty-three (263) comments were received by the WVDOH. Of these, eight (8) were submitted during the public meeting, two hundred fifteen (215) were submitted via the WVDOH online system, and thirty-one (31) were mailed to WVDOH. The remainder (9) were a combination of emails, voicemails, letters to the editor and newspaper advertisements in the *Dominion Post* (2019).

Of the total comments received, nineteen (19) demonstrated support for the Project as currently designed. The remainder expressed concerns related to the design, detour, and necessity of the Project. The most frequently mentioned concerns were:

- The use of turn lanes instead of a roundabout at the Greenbag Road (CR 857) and Dorsey Ave/Kingwood Pike (CR 81) intersection
    - *Response: The intersection options that were evaluated and analyzed during the EA process include turning lanes with traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service (LOS) provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the LOS as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of two or three residences (depending on the turn lane option selected) while the roundabout design does not take any residences or businesses.*
- Impacts to the community garden
    - *Response: The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.*

- Prioritizing road repair, both locally and within the county, over improvements to the Greenbag Road (CR 857) corridor
    - *Response: Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.*
- The use of traffic signals at the intersections instead of roundabouts
    - *Response: The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. The use of traffic signals at the intersections instead of roundabouts was evaluated as part of the turn lane options. See Option A at Mississippi Street (CR 857/1) and Options D and E at Dorsey Avenue/Kingwood Pike (CR 81) for the assessment of impacts to these options.*
- Concerns related to the detour route, including length and conditions of the roadways to be used
    - *Response: The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.*
- Requests for an Environmental Impact Statement (EIS) or EA instead of a Categorical Exclusion (CE)
    - *Response: The environmental document for the project has been elevated from a CE to an EA by the FHWA. Based on the comments received during the first public comment period, FHWA has evaluated the project and determined that an EA is the appropriate level of documentation given the scope and details of the project. Per FHWA guidelines, the EA is a concise document that provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. The EA provides opportunity to describe and evaluate the impacts to social, cultural, natural, economic, and environmental resource factors. A second public meeting will be held to present the EA and allow additional time for review and comment by the public and agencies.*
- A desire to see additional alternatives presented

- *Response: The WVDOH has examined the no build alternative, two build alternatives, and three options for each of the major intersections. When considering all of the possible combinations of the two alternatives with the intersection options, there were 18 possible combinations examined.*

- Returning the Greenbag Road (CR 857) and Dorsey Ave/Kingwood Pike (CR 81) intersection to a 4-way stop
  - *Response: A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.*

Moreover, community members familiar with the community garden indicated that an eagle had been spotted in the area and inquired about an eagle nest survey.

Following the meeting, a public meeting summary report was compiled which included the materials presented to the public, a summary of the comments expressed, and a table of all comments submitted. A copy of the public involvement summary report is included as **Appendix A**.

Due to the comments received during the first public comment period, the NEPA documentation level has been elevated from a CE to an EA.

A second public meeting is planned for 2020 to update the public with the proposed design, to answer any questions, and listen to and consider all comments. The second public meeting is a NEPA requirement to present the EA to the public for comment.

WHAT IS THE PURPOSE AND NEED FOR THIS PROJECT?

The purpose of the Project is to provide operational improvements along Greenbag Road (CR 857) to reduce congestion and address the lack of safe *non-motorized connections* along the corridor.

Greenbag Road (CR 857) is classified as a minor arterial road that provides a convenient route to connect the eastern and southern neighborhoods of the Morgantown area. The Project is needed to ensure safe and efficient transportation access for motorized and non-motorized use of the corridor.

Traffic Congestion

Traffic congestion in the Greenbag Road (CR 857) corridor has been investigated and documented in two different reports. The preliminary study was completed by the MMMPO and documented in the *Greenbag Road Corridor Study* (2015). The WVDOH developed a project based on recommendations from this study as part of the Roads to Prosperity program. The WVDOH directed Stahl Sheaffer Engineering to develop designs for the Project which included a traffic study titled *Greenbag Road (CR857) Preliminary Investigation and Engineering Traffic Study* (2019a). Both the MMMPO corridor study and the traffic study determined that traffic flow through the Greenbag Road (CR 857) corridor is controlled by the *level of service (LOS)* at the major intersections in the corridor. These major intersections include the Mississippi Street (CR 857/1) intersection (**Image 2**) and the Dorsey Avenue/Kingwood Pike (CR 81) intersection (**Image 3**).

With one exception, the current traffic conditions operate at *LOS* D, which is considered acceptable; however, expected growth in the region will negatively impact the flow of traffic and degrade the *LOS* at both intersections to *LOS* F. The traffic congestion at the major intersections will continue to extend farther back until impacting the surrounding intersections at M Tec Drive, Bluegrass Village Driveway, and Luckey Lane (CR 81/6). The exception to the current *LOS* is for the southbound traffic on



Image 2: Intersection of Greenbag Road with Mississippi Street

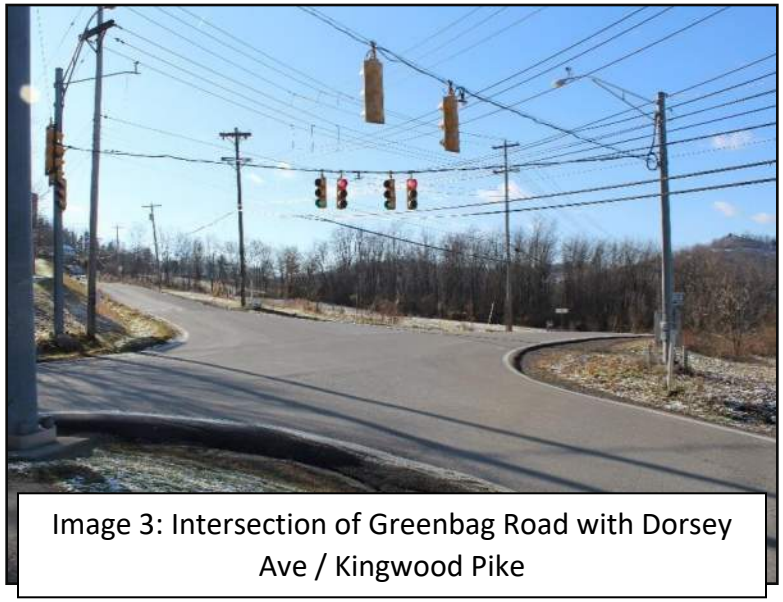


Image 3: Intersection of Greenbag Road with Dorsey Ave / Kingwood Pike

Mississippi Street (CR 857/1) as it approaches Greenbag Road (CR 857), which is already at an *LOS* F during weekday morning hours.

Non-Motorized Connections

Numerous neighborhoods and facilities, including the Mountaineer Mall, Giant Eagle, the Mon Tech Education Center, White Park, Dorsey's Knob Park, Bluegrass Village, South Middle School, and Mountainview Elementary School, are located close to the Greenbag Road (CR 857) corridor and do not currently have safe connections for non-motorized travel (**Image 4**). Community involvement in the development of the MMMPO Corridor study report identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access.



Image 4: Greenbag Road Showing Lack of Safe Pedestrian Facilities

IS THE PROJECT CONSISTENT WITH AREAWIDE PLANS?

The Project falls within the jurisdiction of several area wide plans. These plans consider long-term transportation system planning needs, environmental and community resources, revenue, and expenditures. These include:

- West Virginia Multi-Modal Statewide Transportation Plan (WVDOH 2010);
- Statewide Transportation Improvement Program (STIP) 2020-2025 (WVDOH 2019b);
- 2017-2045 Metropolitan Transportation Plan Update (MMMPO 2017); and
- City of Morgantown Comprehensive Plan (City of Morgantown 2013).

The Project is consistent with the *West Virginia Multi-Modal Statewide Transportation Plan* (WVDOH 2010). This Plan is the principal long term planning document for West Virginia that evaluated the need for a safe, efficient, and effective transportation system across multiple forms of transportation. The Plan uses a number of planning tools, including *SAFETEA-LU* that considers, among other factors, the increased safety of the transportation system for non-motorized

users, as well as the promotion of efficient system connectivity across and between modes of transportation. Moreover, capacity improvements targeting congestion are one of three improvement categories identified in the Plan by the Highway Economic Requirements System – State Version (HERS-ST) model (WVDOH 2010:4-2).

The Project is included in the *Statewide Transportation Improvement Program* (STIP) 2020-2025. The STIP is a federally required document that provides the FHWA and Federal Transit Administration (FTA) a listing of all projects that are candidates for federal-aid or regionally significant projects that are not using federal aid. This capital improvement plan covers a six-year period that incorporates a wide variety of project types including roadway, bridge, bicycle, pedestrian, safety and transit (WVDOH 2019).

Regional studies provided by the MMMPO for the County include the *2017-2045 Metropolitan Transportation Plan Update* (2017). This long range plan establishes strategies for transportation infrastructure investment in the Morgantown area and is compiled by the MMMPO with input from local officials and community involvement. The goals and objectives of the Plan include, among others, creating a transportation system that efficiently and safely moves people and goods by eliminating and/or reducing congestion (MMMPO 2017:7). In addition, the community concerns identified the improvement of traffic flow as the highest priority with sidewalks/crosswalks and bicycle facilities were also identified as a priority.

At the local level, the Project is consistent with the *City of Morgantown Comprehensive Plan* (City of Morgantown 2013). The comprehensive plan was initiated by the City when it reached out to surrounding jurisdictions and government entities to pursue a combined planning effort. The City developed a unified regional vision in collaboration with the MMMPO and Town of Star City to coordinate land use and transportation planning. Included within the Plan's outline was addressing strategies to alleviate traffic congestion, and promote walking, biking, and other transportation alternatives (City of Morgantown 2013:5).

WHAT ALTERNATIVES WERE CONSIDERED?

Two Project *alternatives* (**Alternative 1** and **Alternative 2**) were developed along the proposed corridor, in addition to the **No Build Alternative**. Additionally, there are three possible intersection *options* at each of the two major intersections within the Project. The preferred alternative identified during the course of this environmental assessment utilizes Alternative 2 and intersection options C and F. The basis for this recommendation can be found in the remainder of this document and attached appendices.

In coordination with the WVDOH, a study area was developed to evaluate and compare Alternatives 1 and 2, as well as their potential impacts to any environmental, cultural, community, and *Section 4(f)* resources within the delineated area.

The study area encompassed the potential limits of disturbance for all of the *alternatives* considered (see Environmental Features map on **Figure 12** in the "What are the Potential Impacts of the Project" section).

The *Greenbag Road Corridor Study* (MMMPO 2015) and the *Greenbag Road (CR857) Preliminary Investigation and Engineering Traffic Study* (Stahl Sheaffer Engineering 2019a) both demonstrated that the traffic flow through the corridor is controlled by the *LOS* at the major intersections located at Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) (**Table 1**). Therefore, the study area also evaluated the potential impacts of the Intersection *Options* at each of the two major intersections. **Intersection Option A**, **Option B**, and **Option C** were considered at the Mississippi Street (CR 857/1) intersection. **Intersection Option D**, **Option E**, and **Option F** were considered at the Dorsey Avenue/Kingwood Pike (CR 81) intersection. Again, the study area evaluated the potential Project impacts of each *option* to any environmental, cultural, community, and *Section 4(f)* resources.

Before comparing the *alternatives* and their potential impacts, several design features are consistent in both *Build Alternatives* and *Options*. These design features do not change between *Alternatives* or *Options*, and they are as follows:

- Mississippi Street (CR 857/1) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- Dorsey Avenue (CR 81) will incorporate two 11-foot travel lanes with *curb and gutter* on both sides and a 5-foot concrete sidewalk.
- Kingwood Pike (CR 81) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.
- The east end of Luckey Lane (CR 81/6) will incorporate two 8-foot travel lanes with *curb and gutter* on both sides. The west end of Luckey Lane (CR 81/6) will include a 10-foot travel lane and a 12-foot travel lane with *curb and gutter* on both sides. A 5-foot concrete sidewalk will extend from Dorsey Avenue (CR 81) along Luckey Lane (CR 81/6) to connect with the sidewalk at Mountainview Elementary School.
- From the west end of the Project to the intersection at Mississippi Street (CR 857/1), the Greenbag Road (CR 857) roadway will be improved to incorporate two 11-foot-wide travel lanes, a 12-foot-wide center turn lane, and *curb and gutter*.
- The Greenbag Road (CR 857) roadway between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections will be improved to have a 4-foot paved shoulder on the south side, and 3-foot paved shoulder with a 2-foot *curb and gutter* and a 5-foot concrete sidewalk will be located on the north side. The shoulder widths are sufficient to be shared with bikes.

- The area east of Jonathan Lane on Greenbag Road (CR 857) will be re-paved and undersized stormwater drainage ditches will be expanded to accommodate increased run-off. These improvements will be made for the section of Greenbag Road (CR 857) between Jonathan Lane and the crossing of Aaron Creek.

No-Build Alternative

No work will occur on the roadway. The No-Build Alternative is included in the analysis to provide a baseline for the comparison of impacts during the NEPA process.

Alternative 1

Under Alternative 1 (**Figure 2**), the Greenbag Road (CR 857) roadway will be improved to incorporate two 11-foot-wide travel lanes and a 12-foot-wide continuous shared center turn lane between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections. Some small sections of right-of-way will be needed along the corridor in order to construct and maintain the widened roadway.

Alternative 2

Under Alternative 2 (**Figure 3**), the Greenbag Road (CR 857) roadway between the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) intersections, Greenbag Road (CR 857) will be improved to two 12-foot-wide travel lanes. Eastbound access will be provided to Bluegrass Village via a 12-foot-wide center left turn lane. Some small sections of right-of-way will be needed along the corridor in order to construct and maintain the widened roadway.

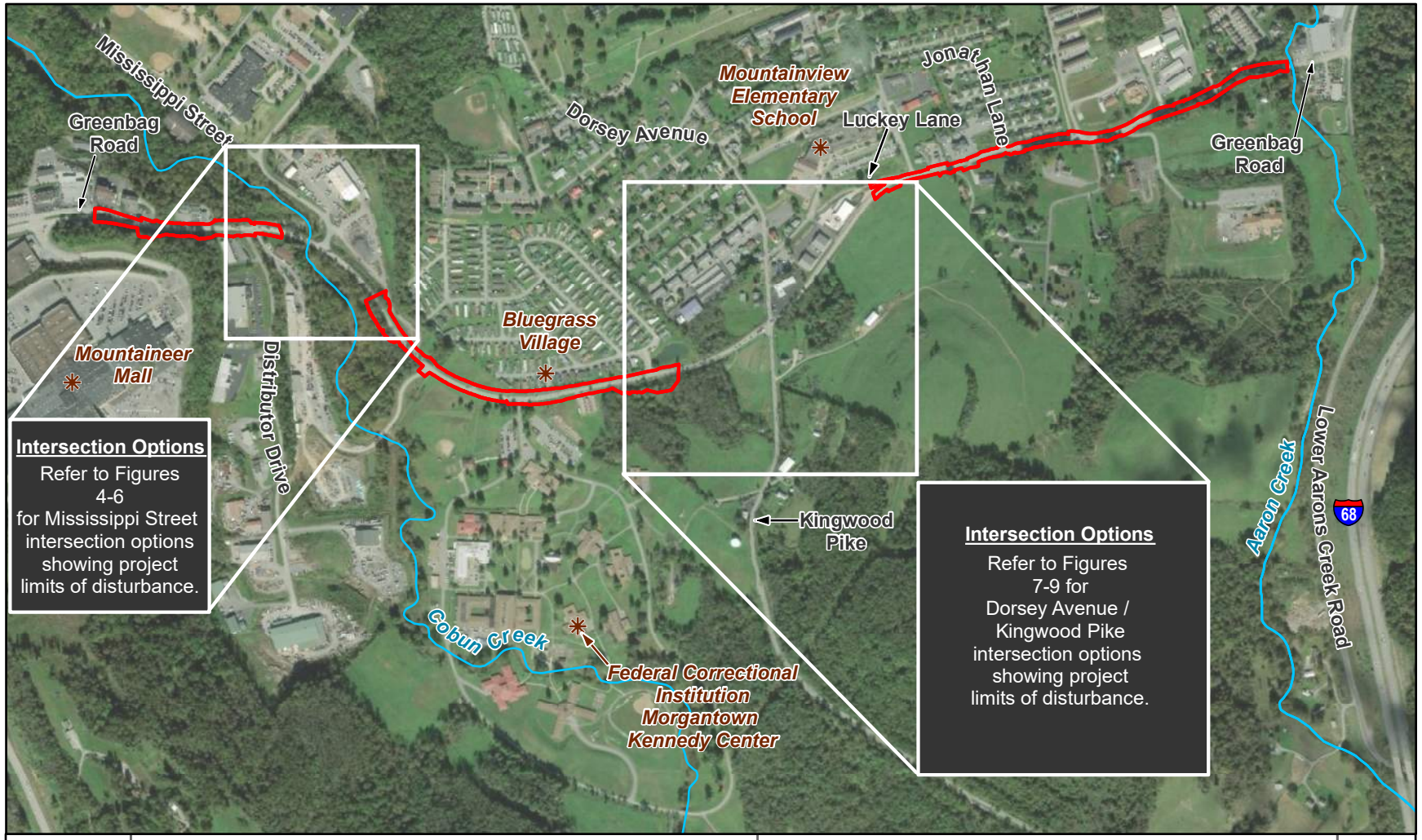


Figure 2
Alternative 1 Limits of Disturbance

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USGS (2017)

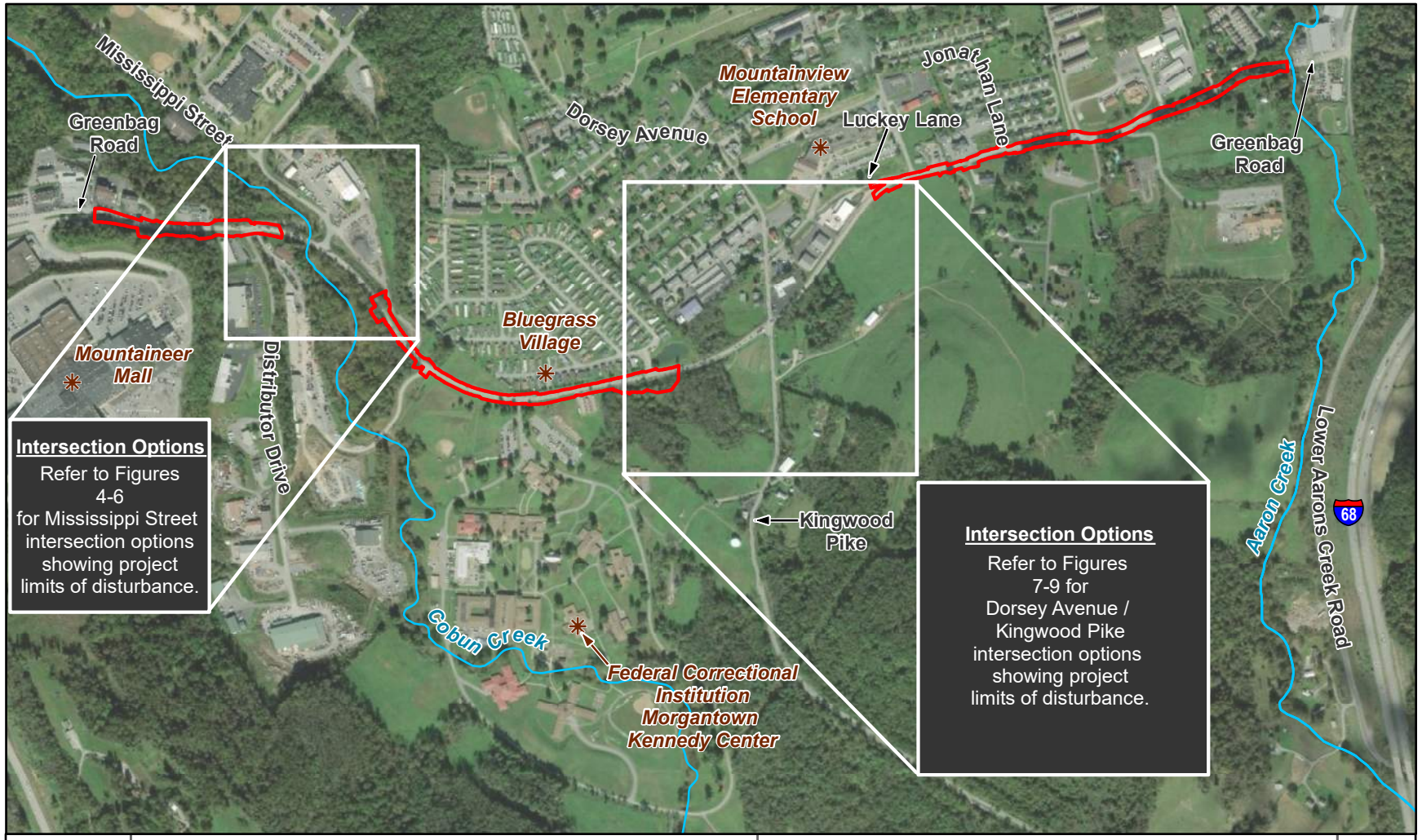


Figure 3
Alternative 2 Limits of Disturbance

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USGS (2017)

Intersection Option A – Mississippi Street (CR 857/1)

Option A, located at the Mississippi Street (CR 857/1) intersection, includes the installation of a 3-phased traffic signal, with a *protected* left turn phase for eastbound traffic, a *permissive* eastbound/westbound phase, and a *protected* southbound phase (**Figure 4**). *LOS* for this option is B in the morning and A in the afternoon.

- The eastbound Greenbag Road (CR 857) approach provides 2 lanes: an exclusive left turn lane, and an exclusive through lane.
- The westbound Greenbag Road (CR 857) approach provides 2 lanes: an exclusive right turn lane and an exclusive through lane.
- The southbound Mississippi Street (CR 857/1) approach provides 2 lanes: an exclusive left turn lane and an exclusive right turn lane.

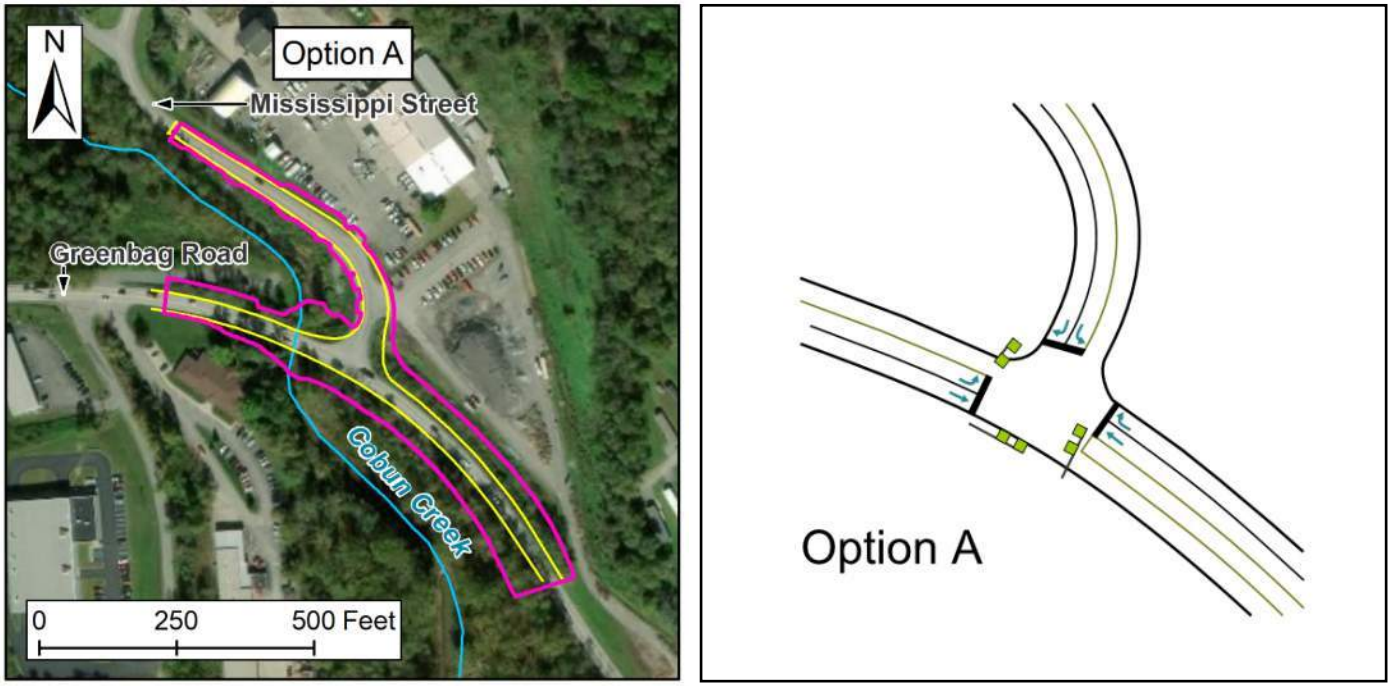


Figure 4: Mississippi Street Intersection Option A Showing Project Limits of Disturbance and Schematic of Traffic Movements

Intersection Option B – Mississippi Street (CR 857/1)

Option B, located at the Mississippi Street (CR 857/1) intersection, includes the construction of a roundabout that provides one circulating lane on the northern portion and two circulating lanes on the southern portion (**Figure 5**). *LOS* for this option is B in the morning and A in the afternoon.

- The eastbound Greenbag Road (CR 857) approach provides an exclusive left turn lane and an exclusive through lane.
- The westbound Greenbag Road (CR 857) approach and southbound Mississippi Street (CR 857/1) approach each provide a single lane for all movements.

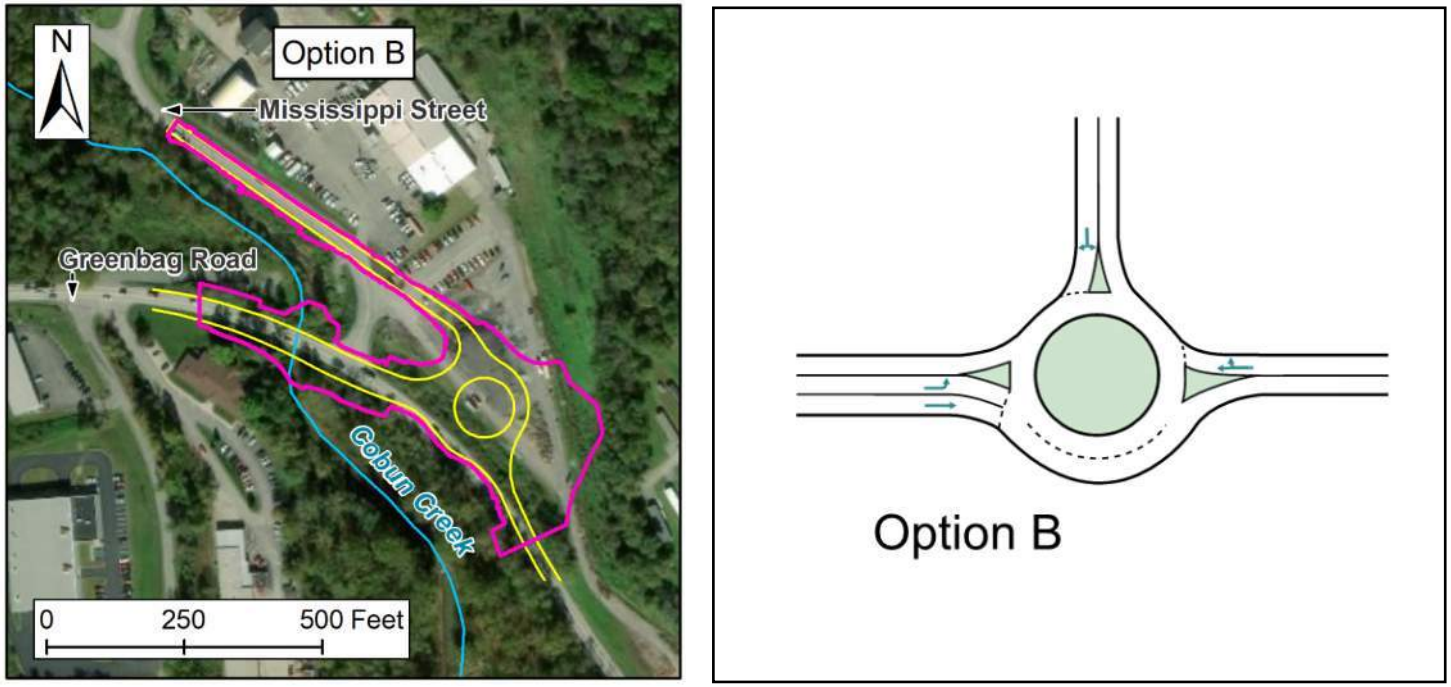


Figure 5: Mississippi Street Intersection Option B Showing Project Limits of Disturbance and Schematic of Traffic Movements

Intersection Option C – Mississippi Street (CR 857/1)

Option C, located at the Mississippi Street (CR 857/1) intersection, includes the construction of a roundabout that provides one circulating lane on the northern portion and two circulating lanes on the southern portion. The roundabout is designed to provide a *truck apron* (**Figure 6**). *LOS* for this option is A in both the morning and the afternoon.

- The eastbound Greenbag Road (CR 857) approach provides exclusive left turn and through lanes.
- The westbound Greenbag Road (CR 857) approach provides two lanes: an exclusive through lane and an exclusive right turn by-pass lane. The exclusive right turn by-pass lane does not enter the roundabout and has a yield controlled right turn lane at its intersection with Mississippi Street (CR 857/1).
- The southbound Mississippi Street (CR 857/1) approach provides one lane for the shared left turn/through movement.

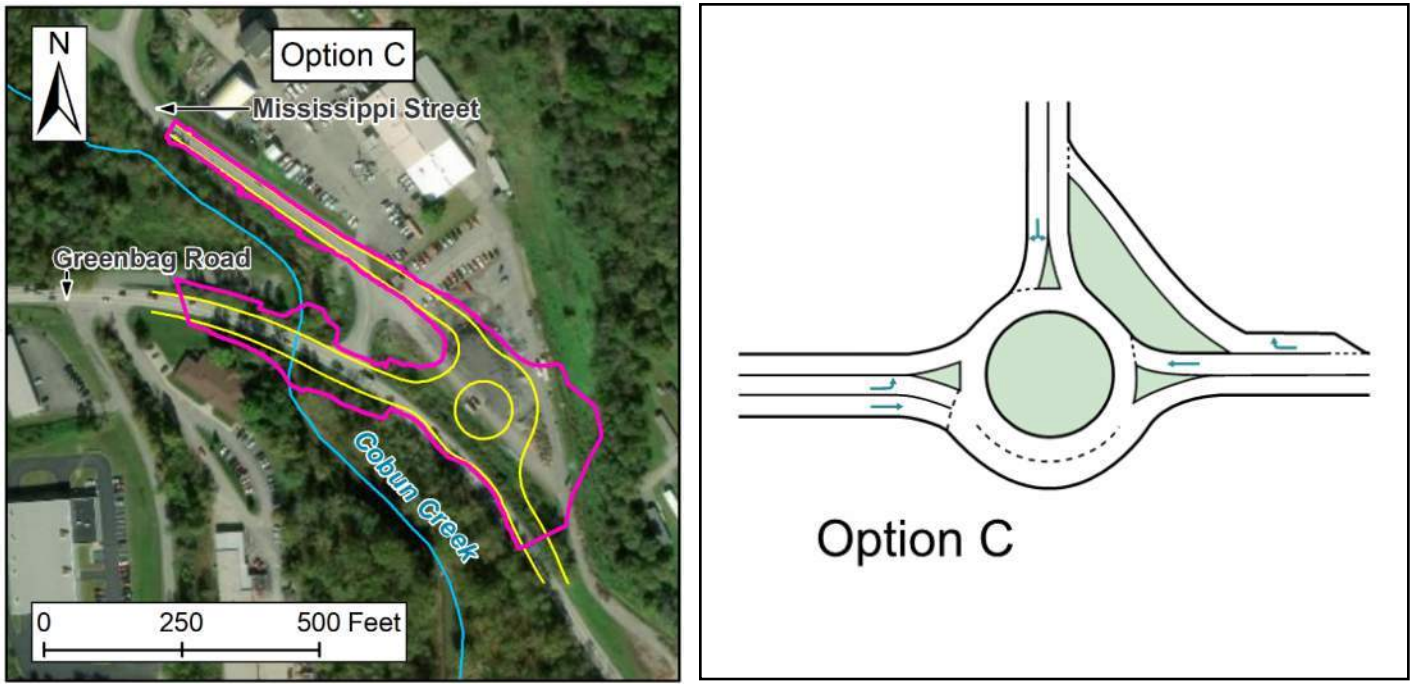


Figure 6: Mississippi Street Intersection Option C Showing Project Limits of Disturbance and Schematic of Traffic Movements

Intersection Option D – Dorsey Avenue / Kingwood Pike (CR 81)

Option D, located at the Dorsey Avenue/Kingwood Pike (CR 81) intersection, includes the installation of a 4-*phased traffic signal*, with an exclusive left turn lane and a shared through/right turn lane on all approaches (**Figure 7**). *LOS* for this option is C in the morning and E in the afternoon.

- Eastbound/westbound *protected* left turn phase
- Eastbound/westbound *permissive* turn phase with corresponding through traffic
- Northbound/southbound *protected* left turn phase
- Northbound/southbound *permissive* turn phase with corresponding through traffic

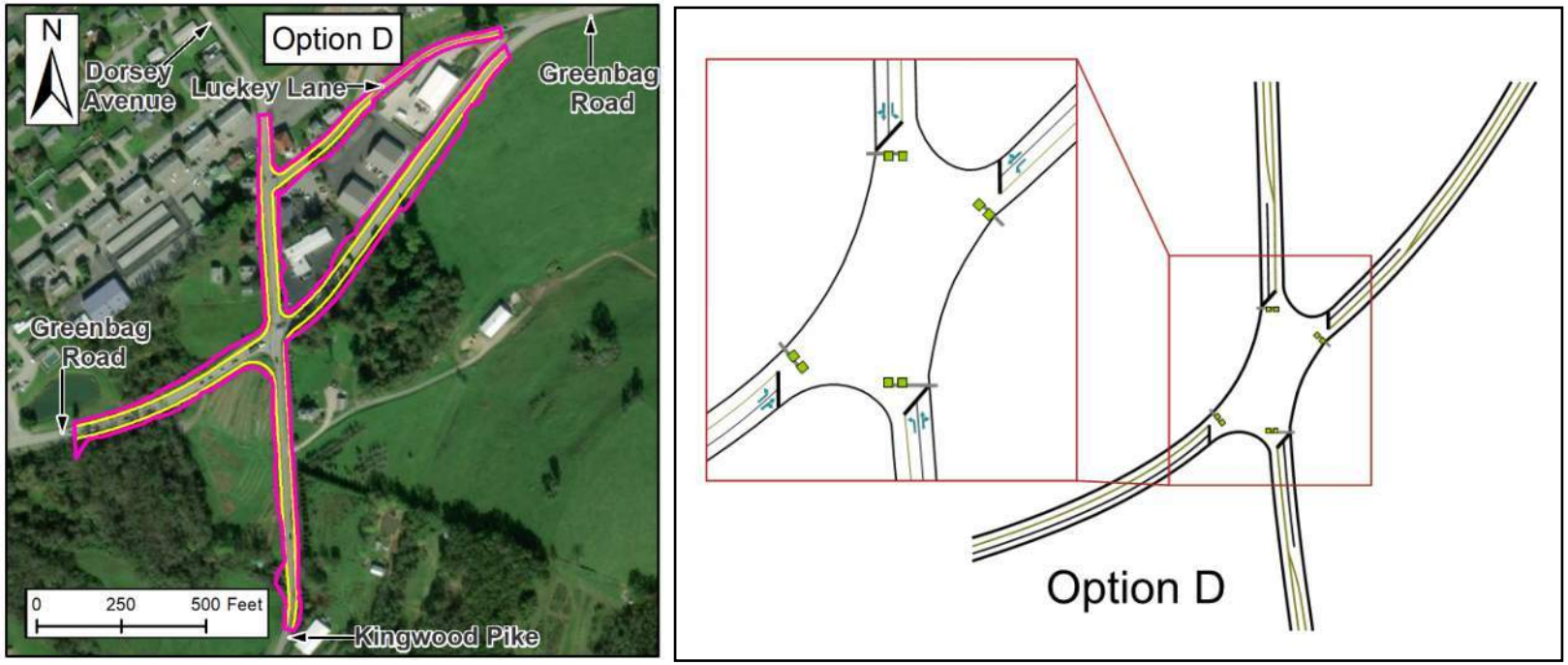


Figure 7: Dorsey Avenue / Kingwood Pike Intersection Option D Showing Project Limits of Disturbance and Schematic of Traffic Movement

Intersection Option E – Dorsey Avenue / Kingwood Pike (CR 81)

Option E, located at the Dorsey Avenue/Kingwood Pike (CR 81) intersection, includes the installation of a 4-*phased traffic signal*, with an exclusive left turn lane, an exclusive through lane, and an exclusive right turn lane on all approaches (**Figure 8**). *LOS* for this option is C in both the morning and the afternoon.

- Eastbound/westbound *protected* left turn phase
- Eastbound/westbound *permissive* turn phase with corresponding through traffic
- Northbound/southbound *protected* left turn phase
- Northbound/southbound *permissive* turn phase with corresponding through traffic

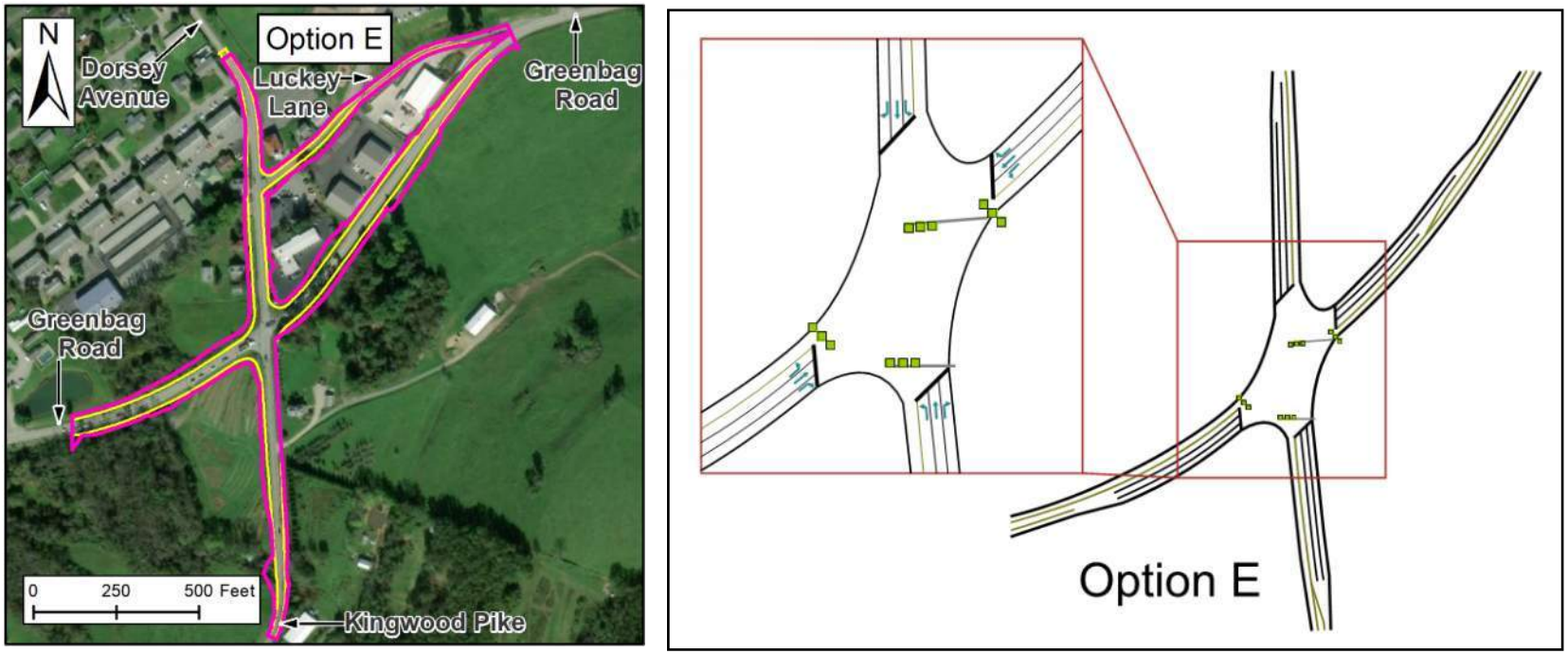


Figure 8: Dorsey Avenue / Kingwood Pike Intersection Option E Showing Project Limits of Disturbance and Schematic of Traffic Movement

Intersection Option F – Dorsey Avenue / Kingwood Pike (CR 81)

Option F, located at the Dorsey Avenue/Kingwood Pike (CR 81) intersection, includes the construction of a roundabout that provides one circulating lane on the northern portion and two circulating lanes on the southern portion. The roundabout is designed to provide a *truck apron* (**Figure 9**). *LOS* for this option is B in the morning and C in the afternoon.

- The northbound Kingwood Pike (CR 81) provides a single lane approach for all movements.
- The southbound Dorsey Avenue (CR 81) provides a single lane approach for all movements.
- The westbound Greenbag Road (CR 857) provides a single lane approach for all movements.
- The eastbound Greenbag Road (CR 857) approach provides two lanes, an exclusive left turn lane and a shared through/right turn lane.

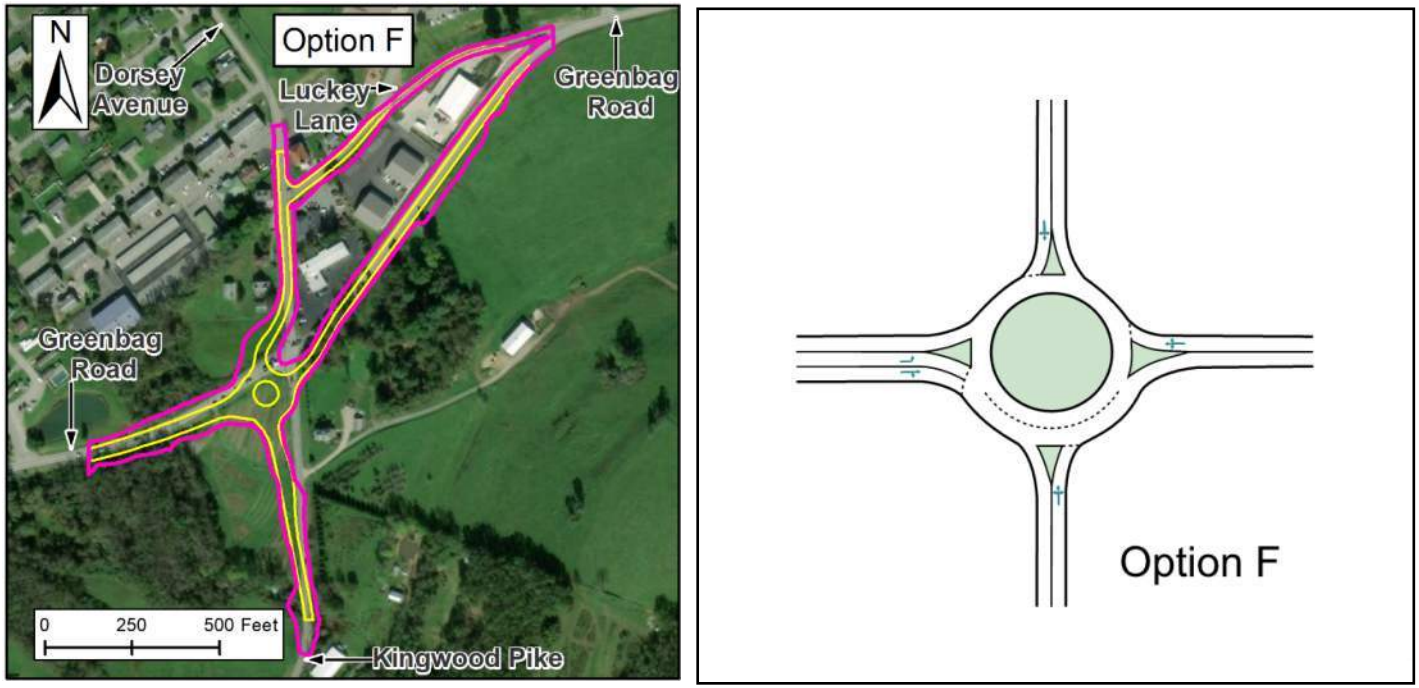


Figure 9: Dorsey Avenue / Kingwood Pike Intersection Option F Showing Project Limits of Disturbance and Schematic of Traffic Movement

*Table 1: Comparison of LOS Results from 2018 Traffic Study**

	2018 Conditions		Design Year 2048							
			Mississippi Street Intersection Options			Dorsey Ave Intersection Options			No Build	
	Mississippi Street	Dorsey Ave / Kingwood Pike	A	B	C	D	E	F	Mississippi Street	Dorsey Ave / Kingwood Pike
Level of Service - morning	*C*	*C*	A	B	A	C	C	B	F	C
Level of Service - afternoon	*A*	*C*	B	A	A	E	C	C	D	F

**Stahl Sheaffer Engineering 2019a*

Typical sections showing the design for the Project are included below in **Figure 10**.

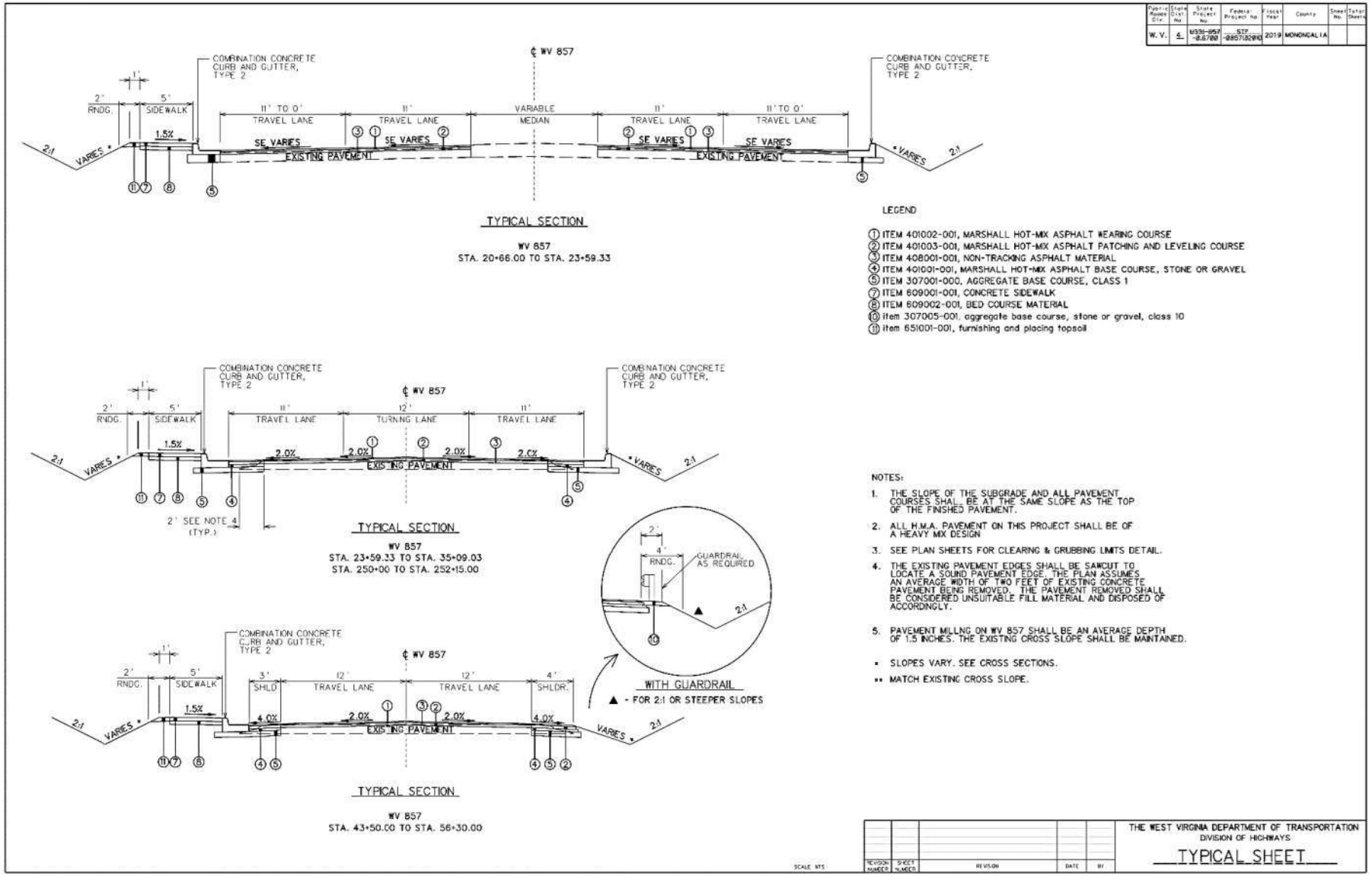


Figure 10: Typical Sections

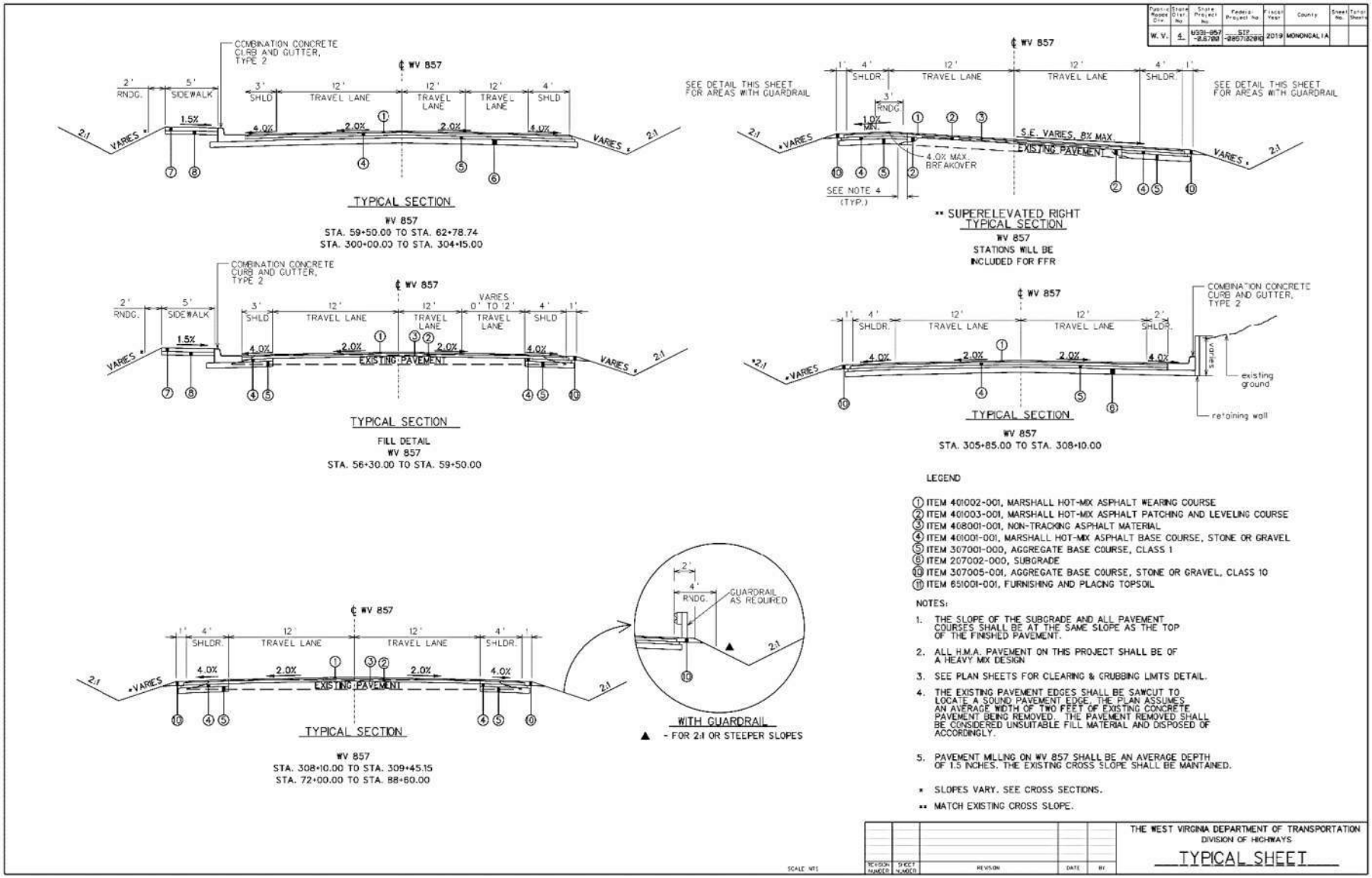


Figure 10: Typical Sections (continued)

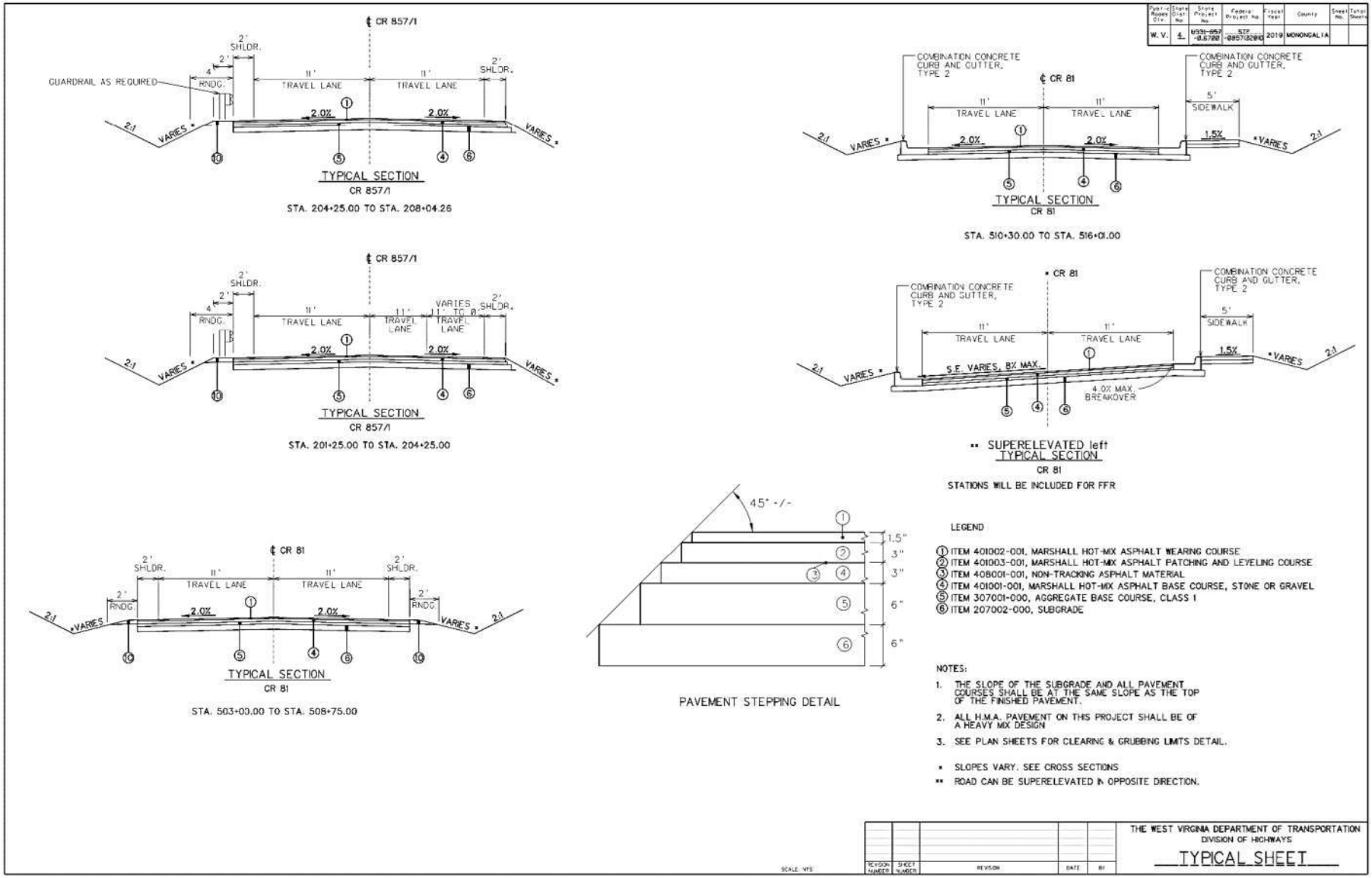


Figure 10: Typical Sections (continued)

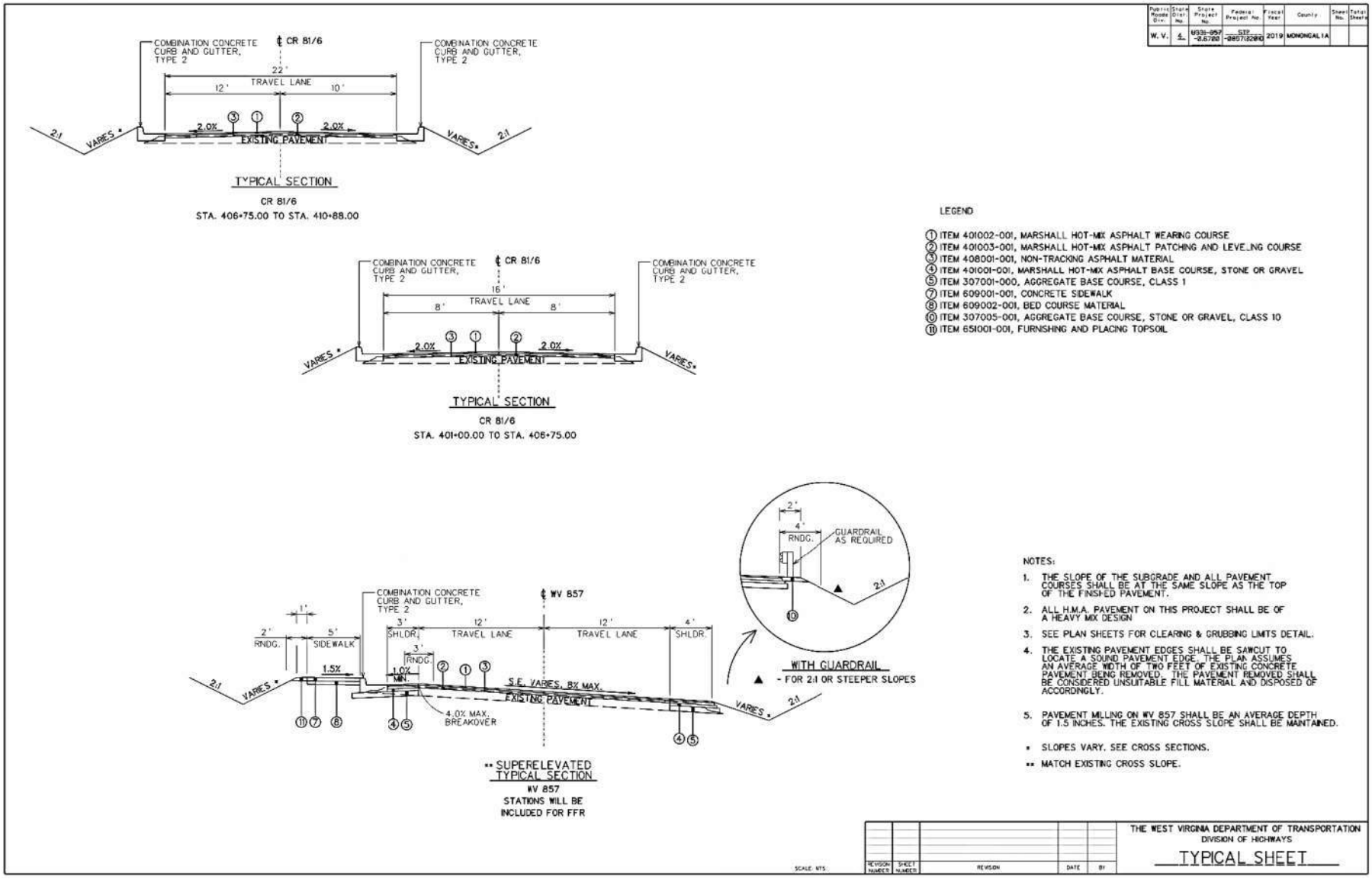


Figure 10: Typical Sections (continued)

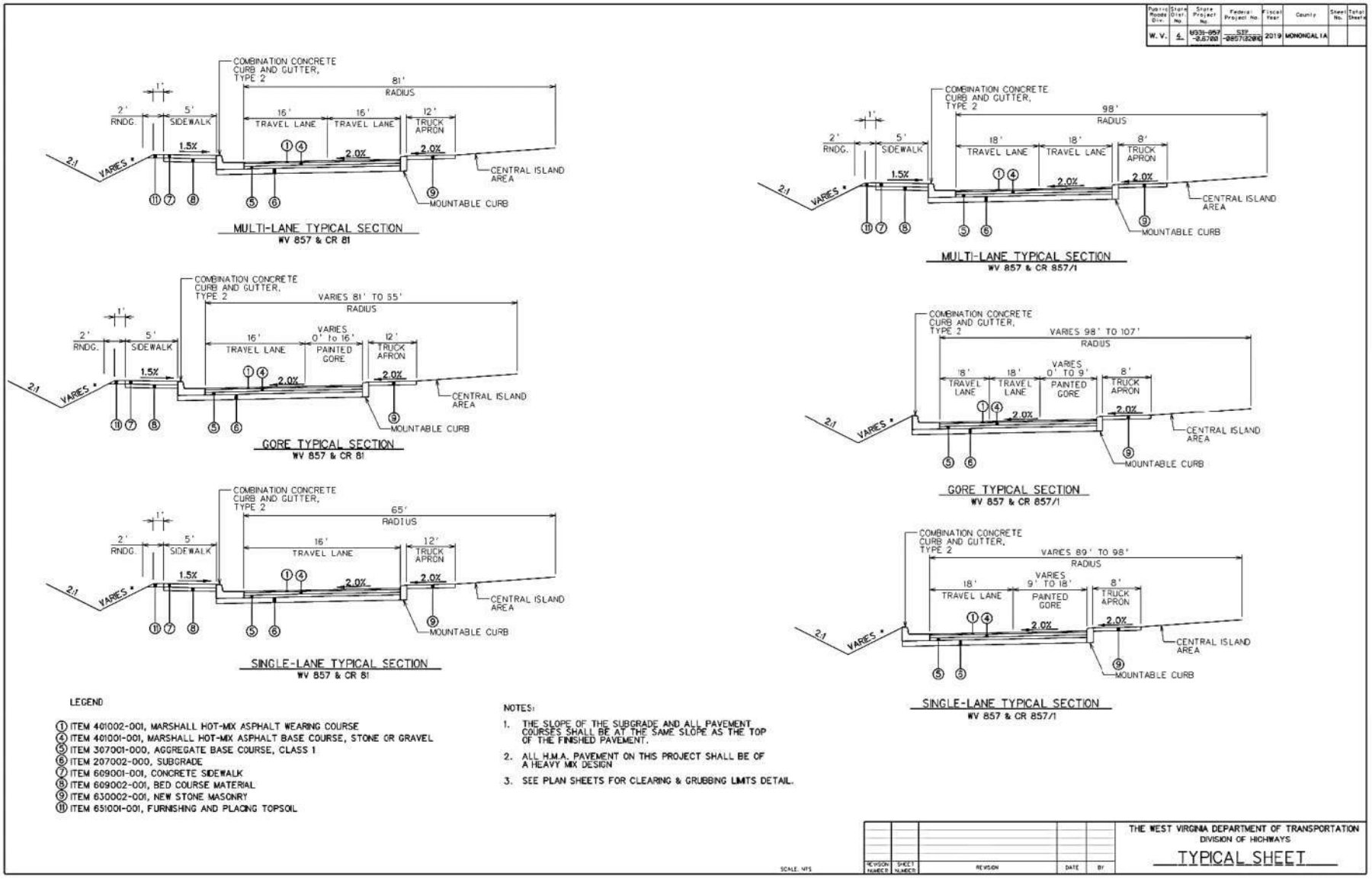


Figure 10: Typical Sections (continued)

WHAT ARE THE POTENTIAL IMPACTS OF THE PROJECT?

Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) was signed on February 11, 1994. This Executive Order was established to protect minority and low-income populations (also referred to as *EJ populations*) from experiencing disproportionately high and adverse impacts resulting from federally funded projects. It requires agencies to identify and address high and adverse impacts of projects that would disproportionately affect minority or low-income populations.

While Executive Order 12898 prohibits discriminatory actions against minority and low-income populations, additional consideration must be given for the elderly, children, disabled, and other populations protected under *Title VI* of the Civil Rights Act of 1964 and related statutes when evaluating the potential for discriminatory impacts of a proposed action.

If disproportionately high and adverse impacts are expected, the proposed Project cannot be completed unless it can be proven that there is a substantial need for the Project; that avoidance and mitigation of the impacts is not practicable, or will have increased high and adverse social, economic, environmental, or human health impacts that are more severe; or there are increased costs of extraordinary magnitude.

The United States Census Bureau (USCB) is the federal agency responsible for collecting national demographic and socioeconomic data, which can be summarized at different geographic scales to reveal information about an area's people and economy. The USCB defines a *census tract* (CT) as a small, relatively permanent statistical subdivision of a county delineated by a local committee of census data users for the purpose of presenting data. *Census tracts* nest within counties, and their boundaries normally follow visible features, but may follow legal geography boundaries and other non-visible features in some instances. *Census tracts* ideally contain about 4,000 people and 1,600 housing units (USCB 2019a). A *block group* (BG) is a statistical subdivision of a census tract and is the smallest geographic unit for which the USCB tabulates sample data. *Block groups* are generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units (USCB 2019a). Since census tracts are comprised of numerous block groups, block groups are typically identified by both their census tract and block group identifiers.

Block groups that fall within 0.5 miles of the Project were used to define an environmental justice (EJ) study area to evaluate the presence of, and potential impacts to, *EJ populations* in the vicinity of the Project (**Figure 11**). The EJ study area comprises CT 109.02, BGs 2, 3, and 4, CT 110, BG 1, 2, and 3, and CT 118.03, BG3.

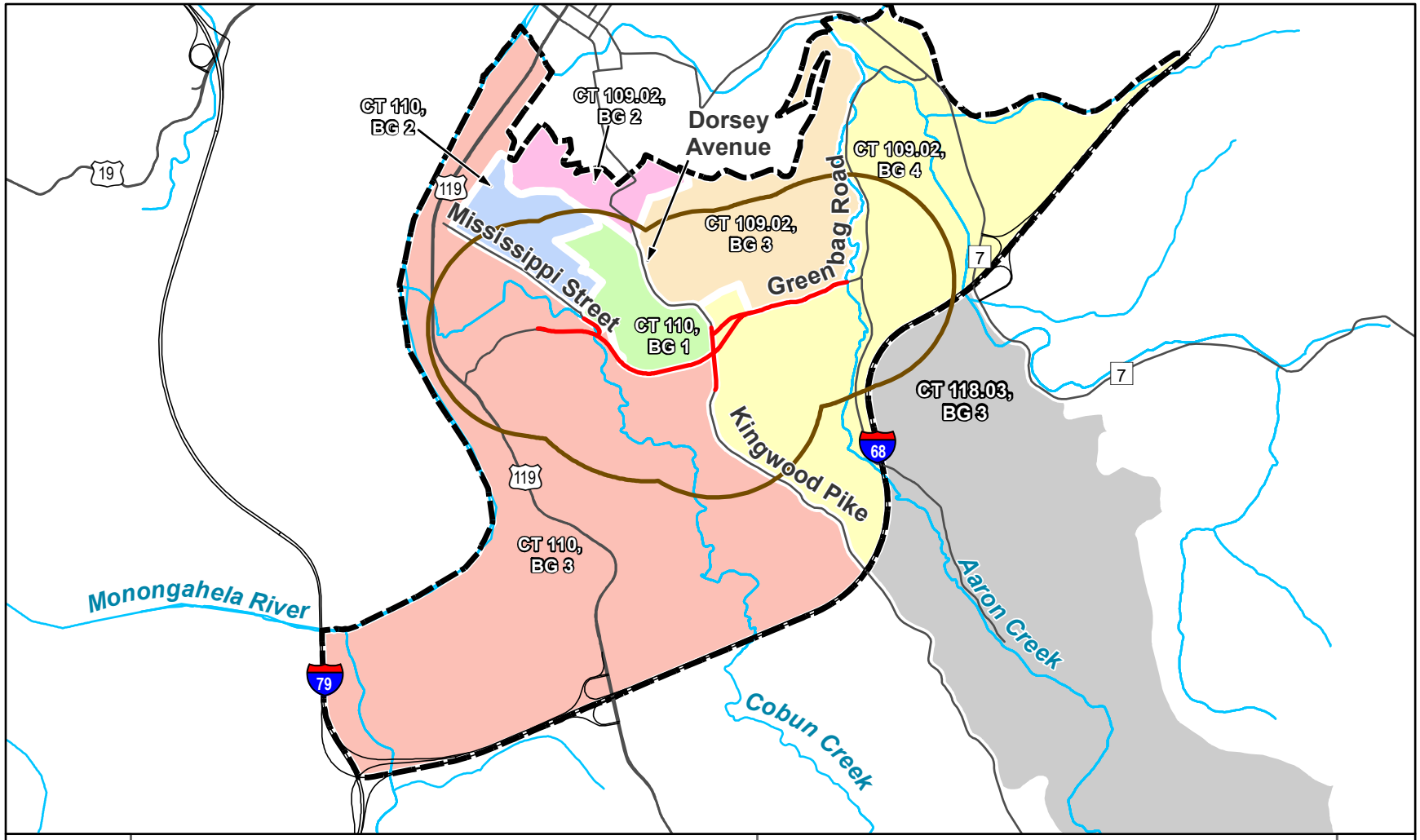


Figure 11
Environmental Justice Study Area

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: WVDOH (2019a), USGS (2017), USCB (2019b)

While CT 118, BG 3 overlaps with the EJ study area for the Project, only four individual parcels within this *block group*, all located east of I-68, are applicable. Based on a qualitative review of these parcels, two serve residential uses, while the other two are held by the same landowner and are agricultural in nature. No residences are apparent on these parcels within the EJ study area, though one potential residence may be located just outside of it on one of the agricultural use parcels. There is no indication that any are owned by, or serve as resources for, *EJ populations* or other populations protected under *Title VI* of the Civil Rights Act of 1964 and related statues. CT 118, BG 3 is also far removed from the Project, and the applicable residences are unlikely to experience any direct impacts as a result of the Project; therefore, this *block group* was excluded from the quantitative component of the EJ analysis.

As seen in **Figure 11**, only CT 110, BG 1 is entirely encompassed by the EJ study area, while the others only partially overlap with the 0.5-mile boundary.

The following section summarizes the demographic makeup of each *block group* within the EJ study area demonstrating notable minority populations when compared to the reference geographies of West Virginia, Monongalia County, and Morgantown. The specific population groups for which data was compiled and assessed are listed in **Table 2** (USCB 2017).

Minority and Hispanic/Latino Populations

Table 2 presents the minority and Hispanic/Latino populations within the *block groups* in the EJ study area.

Shaded values in **Table 2** identify categories with population percentages exceeding those demonstrated in the reference geographies (state, county, and city). **Figure 11** depicts the location of *block groups* with *EJ populations* in the vicinity of the Project. The EJ study area is predominantly Caucasian (81.8%) (USCB 2017).

As shown in **Table 2**, the proportions of Total Minority Populations and Non-Hispanic or Latino Minority Populations in the overall EJ study area, as well as in the following *block groups* (listed in descending order of percentage of total minority population), exceed those of the West Virginia, Monongalia County, and Morgantown reference geographies (those denoted with an asterisk indicate a share of Total Minority Populations in the *block group* also exceeding that of the overall EJ study area):

- CT 110, BG 3 (35.2% Total Minority, 28.3% Non-Hispanic or Latino Minority) *
- CT 110, BG 1 (22.5% Total Minority, 14.3% Non-Hispanic or Latino Minority) *
- CT 109.02, BG 4 (18.9% Total Minority, 17.0% Non-Hispanic or Latino Minority)

The overall EJ study area and four of the six *block groups* included in this EJ analysis demonstrated Total Hispanic or Latino populations exceeding those of the reference geographies. These include two of those listed above that also meet Total Minority thresholds, CT 110, BGs 1 and 3, as well as CT 110, BG 2 and CT 109.02, BG 3.

Findings from the census data analysis for each *block group* meeting thresholds for minority populations are detailed below. A *block group* was considered to include a notable population for a given category if the population percentage exceeded those demonstrated in West Virginia, Monongalia County, and Morgantown.

CT 110, BG3

CT 110, BG3 occupies the south side of Greenbag Road (CR 857), and is also bordered by the Monongahela River to the west, Kingwood Pike (CR 81) to the east, and I-68 to the south. Residents of this *block group* that reside within 0.5 miles of the Project are primarily located at the Federal Correctional Institution (FCI), though other residential areas exist within this *block group* and outside of the EJ study area as well. This *block group* demonstrates the highest percentage of total minorities compared to all the geographies included in this analysis, more than double that of Morgantown, approximately three times greater than that of Monongalia County, and four times greater than that of West Virginia. Similarly, the Non-Hispanic or Latino Minority population in this *block group* represents the greatest proportion compared to the other geographies, greater than those in any of the three reference geographies (West Virginia, Monongalia County, and Morgantown) and more than twice that of the overall EJ study area (USCB 2017). This *block group* demonstrates the most diverse population compared to the other *block groups*. It is comprised of greater percentages of all minority races illustrated in **Table 2**, with the exception of Asian Alone and Native Hawaiian and Other Pacific Islander Alone, compared to the three reference geographies. All of these races except for Native Hawaiian and Other Pacific Islander Alone are more represented in this *block group* than in the overall EJ study area (see **Table 2**).

CT 110, BG 1

CT 110, BG 1 is located just north of the Project, between Mississippi Street (CR 857/1) and Dorsey Avenue (CR 81). As previously noted, this is the only *block group* included in this analysis that is entirely encompassed by the EJ study area, and total minority, Hispanic or Latino, and non-Hispanic or Latino minority populations are all well represented in this *block group*. The highest representation of Two or More Races (12.7%) compared to all other geographies that were included in this analysis occurs in this *block group*.

CT 109.02, BG 4

CT 109.02, BG 4 is on both sides of Greenbag Road (CR 857), east of Dorsey Avenue/Kingwood Pike (CR 81). Land use includes residential, agricultural, and forested tracts, with other important resources in this *block group* including Mountainview Elementary School, Monongalia County Schools Office of Federal Programs, and two churches. As shown

in **Table 2**, the percentage of minority population in this *block group* is approximately twice that of West Virginia, and well-exceeds those of Monongalia County and Morgantown as well. This *block group* also contains higher percentages of Black or African American Alone and Two or More Races compared to West Virginia, Monongalia County, and Morgantown.

Table 2: Greenbag Road Improvement Project Minority, Hispanic, or Latino Populations within the EJ Study Area

	West Virginia	Monongalia County	Morgantown	Study Area						
				Overall[1]	CT 109.02, BG 2	CT 109.02, BG 3	CT 109.02, BG 4	CT 110, BG 1	CT 110, BG 2	CT 110, BG 3
Total Population[2]	1,836,843	103,715	75,028	7,813	823	1,328	896	1,561	1,142	2,063
Total Non-Minority	1,687,570 91.9%	91,130 87.9%	63,700 84.9%	6,320 80.9%	766 93.1%	1,225 92.2%	727 81.1%	1,209 77.5%	1,056 92.5%	1,337 64.8%
Total Minority[3,4]	149,273 8.1%	12,585 12.1%	11,328 15.1%	1,493 19.1%	57 6.9%	103 7.8	169 18.9%	352 22.5%	86 7.5%	726 35.2%
Total Hispanic or Latino	27,021 1.5%	2,161 2.1%	1,908 2.5%	327 4.2%	0 0.0%	77 5.8%	17 1.9%	90 5.8%	36 3.2%	107 5.2%
Non-Hispanic or Latino Minority[5]	114,935 6.3%	9,947 9.6%	8,975 12.0%	1,092 14.0%	57 6.9%	26 2.0%	152 17.0%	224 14.3%	50 4.4%	583 28.3%
Black or African American Alone	65,300 3.6%	3,850 3.7%	3,355 4.5%	553 7.1%	0 0.0%	12 0.9%	62 6.9%	63 4.0%	12 1.1%	404 19.6%
American Indian and Alaskan Native Alone	3,322 0.2%	127 0.1%	75 0.1%	15 0.2%	7 0.9%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	8 0.4%
Asian Alone	14,096 0.8%	3,433 3.3%	3,386 4.5%	52 0.7%	10 1.2%	0 0.0%	0 0.0%	0 0.0%	25 2.2%	17 0.8%
Native Hawaiian and Other Pacific Islander Alone	541 0.0%	0 0.0%	0 0.0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Some Other Race	7,193 0.4%	604 0.6%	604 0.8%	18 0.2%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	18 0.9%
Two or More Races	31,800 1.7%	2,410 2.3%	2,000 2.7%	528 6.8%	40 4.9%	14 1.1%	90 10.0%	199 12.7%	13 1.1%	172 8.3%

Source: USCB 2017

[1] Combined values for Block Groups within the EJ Study Area.

[2] Total population comprises Total Non-Minority and Total Minority Populations.

[3] Minority is defined as all races/ethnicity groups except Non-Hispanic or Latino White alone.

[4] Total Minority is the Total Hispanic or Latino and Non-Hispanic or Latino Minority combined.

[5] Non-Hispanic or Latino Minority is defined as all Non-Hispanic or Latino races except for non-Hispanic or Latino White alone.

Low-income Populations

Table 3 lists low-income populations in *block groups* overlapping with the EJ study area. The proportion of the total population with incomes in the past 12 months below poverty level in the combined *block groups* within the study area boundary was 21%, which exceeds that of West Virginia but not those of the other two reference geographies (i.e., Monongalia County and Morgantown).

Transit resources, which low-income communities and populations with limited access to transportation likely rely on, are present within the EJ study area. Mountain Line Transit Authority operates four fixed bus routes, Route 4 (the Orange Line), 14 (the Brown Line - Mountain Heights), Route 15 (Grafton Road), and Route 50 (Don Knotts). Route 4 originates west of Westover and utilizes Greenbag Road (CR 857), Mississippi Street (CR 857/1), and Dorsey Avenue (CR 81). It includes a stop at the Monongalia County School complex along Mississippi Street (CR 857/1), three stops within Mountaineer Mall, and one stop on Dorsey Avenue (CR 81). Route 14 utilizes Greenbag Road (CR 857) and Kingwood Pike (CR 81) and includes one stop within Mountaineer Mall. Routes 15 and 50 follow US 119 and both include a stop at the Greenbag Road (CR 857) intersection with US 119.

In addition to the fixed bus routes operated by the Mountain Line Transit Authority, the Buckwheat Express shuttle, sponsored by Preston County Senior Citizens, Inc., includes a route that utilizes the Greenbag Road (CR 857) corridor to connect Kingwood, WV with Morgantown. The Buckwheat Express shuttle includes one stop at Mountaineer Mall. Other resources used by low-income populations including affordable housing, resources with programs targeted toward low-income populations, and commercial resources that adjacent neighborhoods may rely on, are detailed at the *block group* level, below.

CT 110, BG 1

CT 110, BG 1 was the only *block group* in the EJ study area demonstrating a higher percentage of low-income population compared to all three reference geographies (West Virginia, Monongalia County, and Morgantown), as shown in the shaded cell in Table 3. An estimated 40.6% of people in this *block group*, which represents the only geography entirely encompassed by the EJ study area, have incomes below the poverty level (**Table 3**; see **Figure 11**). This is roughly twice the poverty rates observed in the overall EJ study area, Monongalia County, and West Virginia (USCB 2013–2017).

Land use within CT 110, BG 1 primarily consists of single family and multifamily residential, with a forested tract that includes a greenway connecting residential areas with public school facilities and parks within and outside of the *block group*. Marjorie Gardens, located along Dorsey Lane, is a Section 8 subsidized affordable housing apartment complex that participates in the Low-Income Housing Tax Credit program. Also within this *block group* and just south of Marjorie

Gardens is Bluegrass Village, a manufactured housing development comprised of approximately 132 units. This development extends south from Marjorie Gardens to the Greenbag Road (CR 857) corridor. Though removed from the Greenbag Road (CR 857) corridor, another manufactured housing development comprised of 42 units is present within this *block group*, approximately 0.5 miles north of the Project along Dorsey Avenue (CR 81).

Table 3: Greenbag Road Improvement Project Low Income Populations

	Population for Whom Poverty Status is Determined	Income in Past 12 Months Below Poverty Level
West Virginia	1,784,004	317,089 17.8%
Monongalia County	97,382	20,763 21.3%
Morgantown	68,855	17,951 26.1%
Study Area[1]	6,970	1,464 21.0%
CT 109.02, BG 2	823	108 13.1%
CT 109.02, BG 3	1,328	55 4.1%
CT 109.02, BG 4	896	219 24.4%
CT 110, BG 1	1,545	627 40.6%
CT 110, BG 2	1,142	160 14.0%
CT 110, BG 3	1,236	295 23.9%

Source: USCB 2017

[1] Combined values for Block Groups within the study area boundary.

CT 109.02, BG 4 and CT 110, BG 3

The share of residents within CT 109.02, BG 4 and CT 110, BG 3 with incomes below the poverty level (23.9% and 24.4%, respectively) exceeded those of the overall EJ study area, as well as those of Monongalia County and West Virginia, but not Morgantown (see **Table 3**).

CT 110, BG 3 borders the Project and is relatively large, with most residents living well outside of the EJ study area. Most of the area within this *block group* in the vicinity of the Project serves commercial (e.g., Mountaineer Mall and a grocery store), business, and institutional (at the FCI) uses. Forested land, agricultural use, and a water supply reservoir are also present within the EJ study area. Several resources serving low-income communities are available within this *block group* and within the EJ study area:

- A gas station/convenience store is located just west of the US 119/Greenbag Road (CR 857) intersection. Gas stations/convenience stores can serve as important community resources for households with limited mobility.
- A Giant Eagle grocery store and pharmacy is located adjacent to the Mountaineer Mall complex.
- Mon Valley Habitat for Humanity, which serves Monongalia, Marion, and Preston counties, is located just north of the Greenbag Road (CR 857) corridor and near the western terminus of the Project.
- The FCI is located south of Greenbag Road (CR 857), adjacent to the Project. This facility offers re-employment services to former inmates.

Title VI Resources

In addition to the resources serving EJ populations discussed in the preceding sections, other resources for the elderly, children, women, and disabled populations protected under Title VI of the Civil Rights Act of 1964 and related statutes are present within the EJ study area:

- Two organizations within the Mountaineer Mall complex cater to elderly populations. Osher Lifelong Learning Institute is an educational organization affiliated with the West Virginia University School of Public Health. Senior Monongalians is a non-profit organization established to improve the quality of life for senior citizens.
- South Middle School, Pierpont Community & Technical College, and Monongalia County Technical Education Center are co-located together off Mississippi Street (CR 857/1).
- Dorsey Center, the Monongalia County Schools Office of Federal Programs, is located in the northeast quadrant of Greenbag Road/Dorsey Avenue/Kingwood Pike. Monongalia County Early Head Start is a federally-funded program, free to pregnant mothers and children ages three and under.

- Mountainview Elementary School, a Monongalia County school, occupies the northwest quadrant of Greenbag Road/Richard Avenue.
- Covenant Evangelical Methodist and Faith Baptist Church, both, located along Greenbag Road (CR 857) 0.5 miles east of the Project, include schools.
- Intensive Trauma Therapy, which serves mentally disabled populations, occupies the northeast quadrant of Greenbag Road/Richard Avenue.
- The previously mentioned Buckwheat Express shuttle service between Kingwood and Morgantown includes free ridership for the elderly.

Summary of Potential Impacts

Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that the Project be assessed to determine whether or not it will have a disproportionately high impact on minority or low-income populations within the area. The WVDOH will work to assure that minority populations and low-income individuals have full access to information on the Project and understand the potential impacts from construction and operation of improved access.

The demographic analysis component of the EJ Analysis identified a notable presence of *EJ populations* within the following *block groups* in **Table 4**.

Table 4: Demographic Analysis

Block Group	Minority	Hispanic or Latino	Low Income
CT 109.02, BG 2			
CT 109.02, BG 3		X	
CT 109.02, BG 4	X		
CT 110, BG 1	X	X	X
CT 110, BG 2		X	
CT 110, BG 3	X	X	
Overall	X		

Based on these results, all *block groups* immediately adjacent to the Project meet thresholds indicating a presence of *EJ populations*. Therefore, any positive or negative impact resulting from this Project or from the *No-Build Alternative* qualifies as a potential impact to these populations.

No-Build Impacts

The *No-Build Alternative* would not result in enhanced safety or mobility along Greenbag Road (CR 857) and intersecting cross-streets for vehicular and multimodal traffic. The corridor's *LOS* would continue to be insufficient for current and future capacity needs (Stahl Sheaffer Engineering 2019b) and safe bicycle and pedestrian facilities connecting residential areas with community resources within and beyond the EJ study area would remain nonexistent. These would affect EJ and non-EJ populations alike; therefore, potential impacts to minority and low-income populations resulting from the *No-Build Alternative* are not expected to be disproportionately high and adverse, and all positive and negative impacts would be distributed equitably throughout the community.

Build Impacts

As noted above, any impact resulting from the construction of this Project may qualify as a potential EJ impact due to the presence of minority and/or low-income populations within *block groups* adjacent to the entire corridor. While adverse impacts are anticipated under the *Build Alternative* for this Project, all are expected to be minor and/or temporary. Potential impacts resulting from the *Build Alternatives* are discussed below in the context of EJ to determine if a disproportionately high and adverse impact to these populations may occur, either to a specific population or cumulatively:

- **Permanent right-of-way impacts**: The roadway and multimodal improvements along Greenbag Road (CR 857) are expected to require a small amount of right-of-way along the entire corridor, with the largest areas located at the intersections with Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR 81) and in areas where drainage basins will be constructed. These impacts apply to the both EJ/*Title VI resources* and non-EJ populations as well, and impacts do not appear to be disproportionately high and adverse.
- **Permanent parking impacts**: In a few cases where right-of-way will be required, parking may be affected at several facilities along the Project. There is no reason to believe that any of these facilities serve as resources for, or are owned by, EJ or Title VI populations, and reductions in parking are not anticipated to affect general operations at the affected facilities or make them noncompliant with minimum parking requirements under the City Ordinance. Therefore, all parking impacts are expected to be minor, equitably distributed, and are not expected to cause disproportionately high and adverse impacts to *EJ populations*.

- **Permanent access changes**: Minor permanent access changes will result from the Project. An auxiliary turn lane will be constructed at the driveway to Bluegrass Village, an EJ resource along Greenbag Road (CR 857). While some may view this as a negative impact, this affect may be offset to some degree by the improved mobility and reduced congestion that will result along the corridor. Auxiliary turn lanes are also proposed in other areas across the corridor; therefore, this minor, permanent access change is expected to affect all populations equivalently.
- **Other minor permanent impacts:** Other Project impacts may include, but are not limited to, reduced distance between resources and the roadway, removal of trees, reduced privacy, and impacts to landscaping. Tree removal is likely to occur along Greenbag Road (CR 857) at the Bluegrass Village property, and as previously discussed, residents of this community expressed concern about this potential impact during the April 16, 2019 public involvement workshop. While this impact will likely affect Bluegrass Village, it is an impact that is expected to be distributed equivalently across all EJ and non-EJ populations along the corridor.
- **Temporary construction easements:** Temporary construction easements may be required along Greenbag Road (CR 857) during Project construction. There is no reason to believe that the properties affected by these easements will impact EJ or Title VI populations or resources.
- **Temporary access/accessibility impacts:** The Project will require a detour during construction activities, which will cause a minor temporary inconvenience for users of the roadway and affected cross-streets. This may cause a minor, temporary delay for Routes 4, 14, 15, and 50 of the Mountain Line Transit Authority, an EJ resource, and for the Buckwheat Express shuttle service, a Title VI resource. Access to and the accessibility of all other EJ/*Title VI resources* within the EJ study area will also be affected. However this impact will affect all users of the corridor and access to all resources proportionally.
- **Permanent bicycle/pedestrian facility improvements:** The Project will construct continuous sidewalks along the corridor from Mountaineer Mall to the Dorsey Avenue/Kingwood Pike (CR 81) intersection, and along Dorsey Avenue (CR 81) and Luckey Lane (CR 81/6) in the vicinity of Mountainview Elementary. Local planning documents recommend facility enhancements for bicyclists and pedestrians in these areas. The improved multimodal connectivity between residential areas along Greenbag Road (CR 857) with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to both EJ and non-EJ populations within the EJ study area. If any of the low-income populations within CT 110, BG 1 lack access to a motorized vehicle, they may be significantly affected by improved access to these resources. Any minor or

temporary adverse impacts associated with the Project will likely be offset to some degree by the construction of bicycle/pedestrian accommodations along the corridor.

As detailed above, all impacts resulting from the *Build Alternative* are expected to be minor and/or temporary. Because notable high and adverse impacts are not expected and all impacts affect non-EJ and *EJ populations* equivalently, there is no reason to believe that any of these individually minor effects would result in a cumulative significant impact to *EJ populations*. Benefits and burdens of the Project will be equitably shared among all populations across the EJ study area.

While minority and low-income populations are present in the Project, no notably adverse community impacts are anticipated with this Project; thus, impacts to minority and low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the Project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI and related statutes.

Environmental Resources within the Project Study Area

Identification of the Study Area's environmental resources was completed by reviewing secondary resources and conducting field reconnaissance. Secondary resources utilized for this Project included United States Geographic Survey (USGS) 7.5 minute topographic quadrangle of Morgantown South, WV (USGS 2016a; United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) on-line database (USFWS 2019); Federal Emergency Management Agency (FEMA) website (FEMA 2019); West Virginia State Historic Preservation Office (SHPO) Interactive GIS Map (SHPO 2019); USGS National Land Cover Database (NLCD) (USGS 2016b); United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA NRCS 2019a); and Google on-line aerial mapping resources.

Environmental resources identified in the Project study area include the following:

- Eight palustrine wetlands;
- Thirteen surface water streams;
- *100-year floodplains* associated with Aaron Creek and Cobun Creek;
- Prime Farmland Soils and Farmland Soils of Statewide Importance;
- Productive Agricultural Land (Hay Production and Livestock);
- Cultural Resources (Campbell Farmhouse & FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center);
- *Section 4(f)* resources FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center);

- Environmental Justice Areas;
- Community Facilities and Services (Emergency Service Providers, Educational Facilities, Churches, and Morgantown City Garage); and
- Land Cover Types (Residential and Commercial developed land, small pockets of deciduous forest, evergreen forest and pasture).

The design of the Project was compared against the existing *environmental features* observed in the Study Area through background research and field investigations. Impacts to the Study Area *environmental features* were determined utilizing the proposed right-of-way requirements associated with the two different build *alternatives* and the intersection *options* under consideration for the Project. A general view of the *environmental features* located within the Study Area are depicted on **Figure 12**. Community facilities and services are shown on **Figure 13**. Additional information and supporting documentation are included in **Appendices B** through **D**.

The tables below summarize the results of this impact assessment.

Table 5 (pages 41 to 52) provides a summary of the potential impacts for ***Alternative* 1**, ***Alternative* 2** and the ***No-Build Alternative***. The impacts listed in Table 5 do not include the impacts for the intersection *options*.

Table 6 (pages 53 to 54) provides a summary of the impacts at the **Mississippi Street Intersection Options A, B, and C**.

Table 7 (pages 55 to 56) provides a summary of the impacts at the **Dorsey Avenue/Kingwood Pike Intersection Options D, E and F**.

Note, only resources that have impacts for the intersection *options* are being presented in Tables 6 and 7.

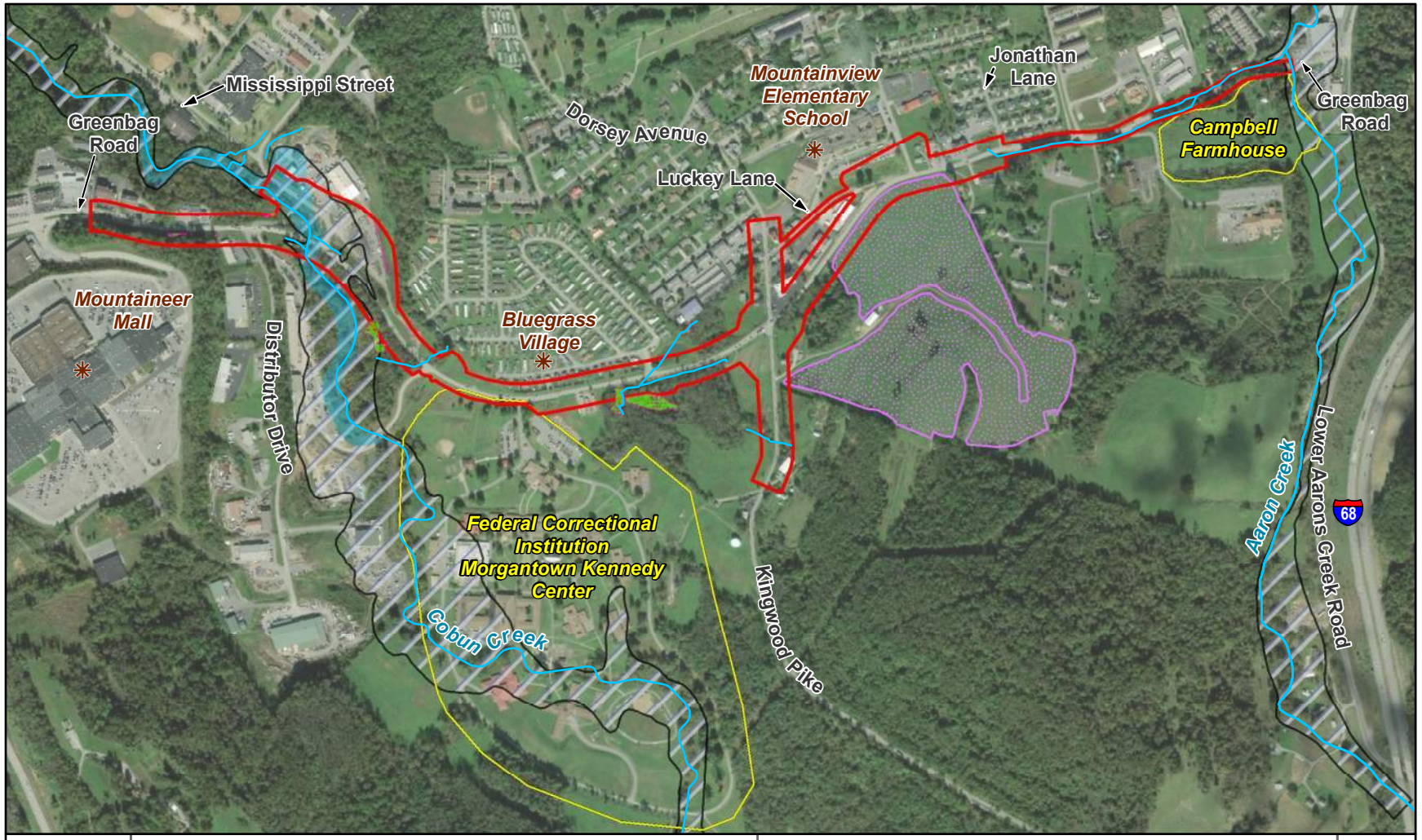


Figure 12
Environmental Features Map

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USGS (2017), USDHS (2017)

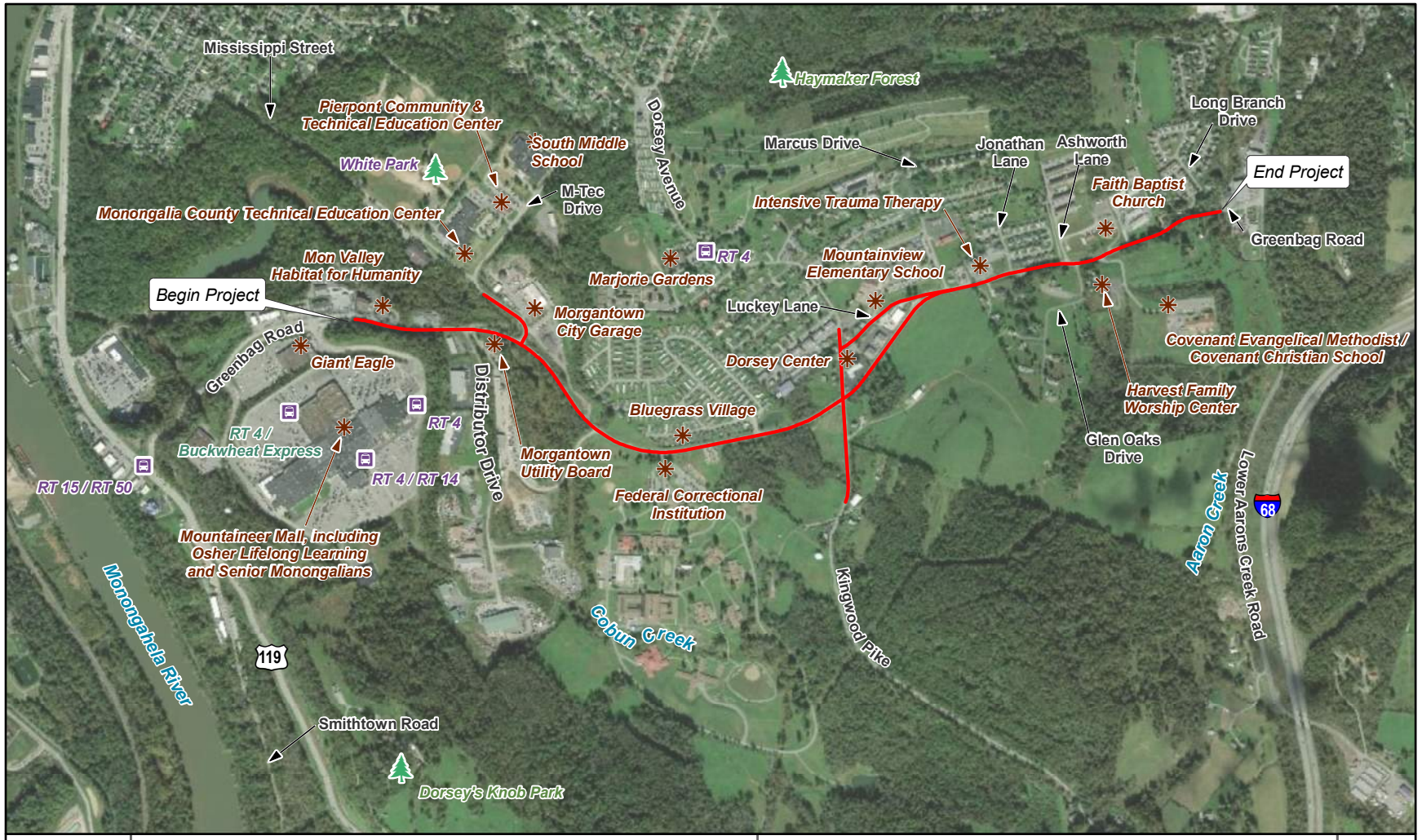


Figure 13
Community Facilities and Services

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018)

Table 5: Impacts Analysis Table – Alternatives

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Environmental Justice	Federal agencies are required to assess whether proposed projects will have a disproportionately high impact on minority or low-income populations. While minority and low-income populations are present in the Project area, no notably adverse community impacts are anticipated with this Project; thus, impacts to minority and low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the Project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI and related statutes.	All *block groups* immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. While adverse impacts are anticipated under this *alternative*, all are expected to be minor and/or temporary and all impacts affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access.	All *block groups* immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. While adverse impacts are anticipated under this *alternative*, all are expected to be minor and/or temporary and all impacts affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access.	The *No-Build Alternative* would not result in enhanced safety or mobility along Greenbag Road and intersecting cross-streets for vehicular and multimodal traffic. The corridor's *LOS* would continue to be insufficient for current and future capacity needs and its intersection with Dorsey Avenue/Kingwood Pike would remain skewed and unsafe for all users. These continued conditions would affect EJ and non-EJ populations alike; therefore, potential impacts to minority and low-income populations resulting from the *No-Build Alternative* are not expected to be disproportionately high and adverse, and all positive and negative impacts would be distributed equitably throughout the community.
Displacements	Land use along the Project corridor represents a mixture of residential, commercial, and Federal properties.	One residential property would require relocation under this *alternative*.	There would be no relocations for residential or commercial properties under this *alternative*.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Community Cohesion	Changes to community cohesion resulting from the proposed Project may be adverse or beneficial by splitting or isolating neighborhoods, generating new development, or connecting residents with facilities or services.	The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.	The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.	Safe bicycle and pedestrian facilities connecting residential areas with community resources within and beyond the Project area would remain nonexistent.
Land Cover	Review of the U.S. Geologic Survey 2016 Land Cover dataset indicates that the Project area has been classified primarily as Developed, ranging from high to low intensity with small pockets of deciduous forest, evergreen forest and pasture (USGS 2016b).	This alternative will impact the following land cover types: ❖ Developed land (low intensity: 1.2 acres; medium intensity: 0.4 acres) ❖ Pasture - 0.2 acres Developed open space - 0.3 acres.	This alternative will impact the following land cover types: ❖ Developed land (low intensity: 1.1 acres; medium intensity: 0.3 acres) ❖ Pasture - 0.2 acres Developed open space - 0.2 acres.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Farmlands	*Farmland Protection Policy Act* soils are present in the area. The form *NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Project* rating was less than the 60-point threshold.	This *alternative* will impact 2.9 acres of *Farmland of Statewide Importance* soils and 0.3 acres of Prime Farmland soils. Of these acres, 2.1 acres of *Farmland of Statewide Importance* soils and 0.2 acres of Prime Farmland soils are presently developed. As a result of the *alternative*, 0.8 acres of *Farmland of Statewide Importance* soils will be converted to transportation land use and 0.1 acres of Prime Farmland soils will be converted to transportation land use.	This *alternative* will impact 2.5 acres of *Farmland of Statewide Importance* soils and 0.3 acres of Prime Farmland soils. Of these acres, 1.9 acres of *Farmland of Statewide Importance* soils and 0.2 acres of Prime Farmland soils are presently developed. As a result of the *alternative*, 0.6 acres of *Farmland of Statewide Importance* soils will be converted to transportation land use and 0.1 acres of Prime Farmland soils will be converted to transportation land use.	No Impact
	Productive agricultural land is present in the Project area. The Thomas E. Richards Trust Farm is located south of the Greenbag Road intersection with Luckey Lane and appears to be used for livestock and hay production.	This *alternative* will result in an impact of 0.07 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.	This *alternative* will result in an impact of 0.07 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Rare, Threatened, and Endangered Species (RTE)	The West Virginia Division of Natural Resources (WVDNR) reviewed the Project area and requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The US Fish and Wildlife Service (USFWS) reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required." The USFWS letter and WVDNR responses are attached within **Appendix D**.	No Impact	No Impact	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Streams	An aquatic resource investigation was completed in 2019. The Project study area surface waters were classified as either intermittent or perennial according to the definitions set forth in *Title 46 and the West Virginia Surface Mining Rules.* The Project area is located within the Monongahela watershed and the streams impacted include Cobun Creek and Unnamed Tributaries to Cobun Creek and Aaron Creek. Impacts will be the result of roadway widening and the replacement or extension of drainage ditches, drainage pipes, and culverts. The complete aquatic resources report is included as **Appendix B**.	The impacts to the streams located within this *alternative* are as follows: ❖ Perennial – 2,447 linear feet ❖ Intermittent – 255 linear feet The Total stream impacts for this *alternative* are 2,703 linear feet.	The impacts to the streams located within this *alternative* are as follows: ❖ Perennial – 2,477 linear feet ❖ Intermittent – 255 linear feet The Total stream impacts for this *alternative* are 2,732 linear feet.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Wetlands	An aquatic resource investigation was completed in 2019. The wetland identification and delineation investigation was conducted in accordance with the methodology described in the USACE Corp of Engineers Wetland Delineation Manual and the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The complete aquatic resources report is included as **Appendix B** and the wetlands are shown on the environmental features maps within this report.	Three wetlands will be impacted by this *alternative*. The impacts to the wetlands are as follows: ❖ Palustrine Emergent – 0.01 acres ❖ Palustrine Forested – 0.05 acres The Total wetland impacts for this *alternative* are 0.06 acres.	Two wetlands will be impacted by this *alternative*. The impacts to the wetlands are as follows: ❖ Palustrine Emergent – 0.01 acres ❖ Palustrine Forested – 0.04 acres The Total wetland impacts for this *alternative* are 0.05 acres.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Floodplains	Federal guidelines require the use of the National Flood Insurance Program maps to evaluate the effect of the Project on *100-year floodplain*s. FEMA has identified floodplains on both Cobun Creek and Aaron Creek. The WVDOH will apply for a Monongalia County Floodplain permit prior to any construction.	Floodplain impacts are localized at the Cobun Creek crossing which is included in the impacts for the Mississippi Street intersection options A, B, & C. Refer to Table 2 for impacts to the floodplain.	Floodplain impacts are localized at the Cobun Creek crossing which is included in the impacts for the Mississippi Street intersection options A, B, & C. Refer to Table 2 for impacts to the floodplain.	No Impact
Groundwater	Aquifers are at a sufficient depth to be protected from Project construction. The full Project area is supplied by public water service.	No Impact	No Impact	No Impact
Air Quality	Monongalia County is in attainment with National Ambient Air Quality Standards for all criteria pollutants and is not listed in the transportation conformity plan for West Virginia. The Project is exempt under the CAA conformity rule under *40CFR 93.126* and from project-level and Regional Conformity analysis.	No Impact	No Impact	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Noise	The Project includes improvements at two intersections, roadway lane widening, re-paving, and drainage improvements. A noise analysis report was prepared in accordance with the WVDOH Highway Traffic Noise Policy and 23CFR 772. The noise report is included in **Appendix C**.	The noise analysis report indicates the Greenbag Road and intersection improvements for this *alternative* do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts is required.	The noise analysis report indicates the Greenbag Road and intersection improvements for this *alternative* do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts is required.	No Impact
Potentially Hazardous Waste	The Morgantown City Garage has been identified as an area of concern. The WVDOH has committed to completing a *Phase I Environmental Site Assessment* for the Project area once right-of-way impacts to the property are defined. The results of that assessment will be documented in the FONSI.	*To be provided by the WVDOH.*	*To be provided by the WVDOH.*	*To be provided by the WVDOH.*

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Historic Resources	A survey of the historic structures within the Project area of potential effect was completed in 2019. The survey identified two resources as potentially eligible for listing on the National Register of Historic Places (NRHP). In a letter dated January 2, 2020, the SHPO concurred with the eligibility recommendations for all surveyed resources and concurred with the recommendation that the project will have No Adverse Effect on either of the historic properties. The concurrence letter is included in **Appendix D**. The report is included as **Appendix E**.	No Adverse Effect	No Adverse Effect	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Archaeological Resources	A Phase I archaeological survey was completed in 2019 and did not identify any archaeological resources within the study area for the corridor. In a letter dated November 19, 2019, the SHPO determined no further archaeological investigations are necessary. The concurrence letter is included in **Appendix D**. The report is included in **Appendix F**.	No Impact	No Impact	No Impact
Utilities	Electric, gas, sewer, and water lines have been identified within the Project corridor.	Several utility lines and associated components will be relocated.	Several utility lines and associated components will be relocated.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Section 4(f) Resources	Federal laws stipulate that FHWA cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent avoidance *alternative* to the use of land and the action includes all possible planning to minimize harm to the property resulting from such use or FHWA determines that the use of the property will have a *de minimis* impact.	Two NRHP-eligible resources were identified within the Project vicinity: the Campbell Farmhouse and the FCI Morgantown facility. The Campbell Farmhouse will not have direct impacts to the property. There will be no right-of-way acquired from the FCI Morgantown facility, thereby resulting in No Use of the Section 4(f) resource.	Two NRHP-eligible resources were identified within the Project vicinity: the Campbell Farmhouse and the FCI Morgantown facility. The Campbell Farmhouse will not have direct impacts to the property. There will be no right-of-way acquired from the FCI Morgantown facility, thereby resulting in No Use of the Section 4(f) resource.	No Impact

Table 5: Impacts Analysis Table – Alternatives (continued)

Resource or Elements	Context	Alternative 1	Alternative 2	No Build
Temporary Construction Impacts	Construction will create short-term impacts related to increased noise and air pollution, erosion, and traffic delays or detours.	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.	No Impact

Table 6: Impacts Analysis Table – Mississippi Street Intersection Options

Resource or Elements	Context	A (Traffic Signal)	B (Roundabout)	C (Roundabout with dedicated right turn lane)
Farmlands	*Farmland Protection Policy Act* soils are present in the area. The form *NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Project* rating was less than the 60-point threshold.	This option will impact 0.01 acres of *Farmland of Statewide Importance* and 2.7 acres of Prime Farmland. Of these acres, 0.01 acres of *Farmland of Statewide Importance* and 2.6 acres of Prime Farmland are developed.	This option will impact 0.1 acres of *Farmland of Statewide Importance* and 0.8 acres of Prime Farmland. Of these acres, 0.1 acres of *Farmland of Statewide Importance* and 0.8 acres of Prime Farmland are developed.	This option will impact 0.1 acres of *Farmland of Statewide Importance* and 0.8 acres of Prime Farmland. Of these acres, 0.1 acres of *Farmland of Statewide Importance* and 0.8 acres of Prime Farmland are developed.
	Productive agricultural land is present in the Project area. The Thomas E. Richards Trust Farm is located south of the Greenbag Road intersection with Luckey Lane and appears to be used for livestock and hay production.	No Impact	No Impact	No Impact
Land Cover	Review of the U.S. Geologic Survey 2016 Land Cover dataset indicates that the Project area has been classified primarily as Developed, ranging from high to low intensity with small pockets of deciduous forest, evergreen forest and pasture (USGS 2016b).	This option will impact developed land (low intensity: 0.5 acres; medium intensity: 1.2 acres; high intensity: 0.9).	This option will impact developed land (low intensity: 0.6 acres; medium intensity: 1.3 acres; high intensity: 0.9).	This option will impact developed land (low intensity: 0.6 acres; medium intensity: 1.3 acres; high intensity: 0.9).

Table 6: Impacts Analysis Table – Mississippi Street Intersection Options (continued)

Resource or Elements	Context	A (Traffic Signal)	B (Roundabout)	C (Roundabout with dedicated right turn lane)
Streams	An aquatic resource investigation was completed in 2019. The complete aquatic resources report is included as **Appendix B** and streams are shown on the environmental features maps within this report.	The impacts to the streams located within this option are as follows: ❖ Perennial – 338 linear feet ❖ Intermittent – 162 linear feet The Total stream impacts for this option are 500 linear feet.	The impacts to the streams located within this option are as follows: ❖ Perennial – 356 linear feet ❖ Intermittent – 165 linear feet The Total stream impacts for this option are 521 linear feet.	The impacts to the streams located within this option are as follows: ❖ Perennial – 356 linear feet ❖ Intermittent – 165 linear feet The Total stream impacts for this option are 521 linear feet.
Wetlands	An aquatic resource investigation was completed in 2019. The complete aquatic resources report is included as **Appendix B** and the wetlands are shown on the environmental features maps within this report.	One PEM wetland will be impacted by this intersection option for a total of 0.05 acres.	One PEM wetland will be impacted by this intersection option for a total of 0.05 acres.	One PEM wetland will be impacted by this intersection option for a total of 0.05 acres.
Floodplains	Federal guidelines require the use of the National Flood Insurance Program maps to evaluate the effect of the Project on *100-year floodplain*s. FEMA has identified floodplains on both Cobun Creek and Aaron Creek.	This option will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.	This option will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.	This option will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.

Table 7: Impacts Analysis Table – Dorsey Avenue / Kingwood Pike Intersection Options

Resource or Elements	Context	D (Traffic signal with exclusive left and shared through/right turn lane)	E (Traffic signal with exclusive left turn lane, exclusive through lane, exclusive right turn lane)	F (Roundabout)
Displacements	Land use along the Project corridor represents a mixture of residential, commercial, and Federal properties.	Two residences would require relocation with this intersection option.	Three residences would require relocation with this intersection option.	There would be no relocations for residential or commercial properties under this intersection option.
Farmlands	*Farmland Protection Policy Act* soils are present in the area. The form *NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Project* rating was less than the 60-point threshold.	This option will impact 2.2 acres of *Farmland of Statewide Importance*. Of these acres, 1.4 acres of *Farmland of Statewide Importance* are developed. However, no areas of productive farmlands will be impacted therefore this impact is expected to be negligible.	This option will impact 2.8 acres of *Farmland of Statewide Importance*. Of these acres, 1.7 acres of *Farmland of Statewide Importance* are developed. However, no areas of productive farmlands will be impacted therefore this impact is expected to be negligible.	This option will impact 3.1 acres of *Farmland of Statewide Importance*. Of these acres, 1.7 acres of *Farmland of Statewide Importance* are developed. However, no areas of productive farmlands will be impacted therefore this impact is expected to be negligible.
	Productive agricultural land is present in the Project area. The Thomas E. Richards Trust Farm is located south of the Greenbag Road intersection with Luckey Lane and appears to be used for livestock and hay production.	This option will result in an impact of 0.31 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.	This option will result in an impact of 0.31 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.	This option will result in an impact of 0.29 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.
Land Cover	Review of the USGS 2016 Land Cover dataset indicates that the Project area has been classified primarily as Developed, ranging from high to low intensity with small pockets of deciduous forest, evergreen forest and pasture (USGS 2016b).	This option will impact: ❖ developed land (low intensity: 1.2 acres; medium intensity: 0.8 acres; high intensity: 0.1); ❖ deciduous forest - 0.3 acres; and ❖ developed open space - 0.8 acres.	This option will impact: ❖ developed land (low intensity: 1.3 acres; medium intensity: 0.9 acres; high intensity: 0.2); ❖ deciduous forest - 0.3 acres; and ❖ developed open space - 1.0 acres.	This option will impact: ❖ developed land (low intensity: 1.7 acres; medium intensity: 0.7 acres; high intensity: 0.1); ❖ deciduous forest - 0.5 acres; and ❖ developed open space - 1.1 acres.

Table 7: Impacts Analysis Table – Dorsey Avenue / Kingwood Pike Intersection Options (continued)

Resource or Elements	Context	D (Traffic signal with exclusive left and shared through/right turn lane)	E (Traffic signal with exclusive left turn lane, exclusive through lane, exclusive right turn lane)	F (Roundabout)
Streams	An aquatic resource investigation was completed in 2019. The complete aquatic resources report is included as **Appendix B** and streams are shown on the environmental features maps within this report.	The impacts to the streams located within this option are as follows: ❖ Perennial – 95 linear feet ❖ Intermittent – 333 linear feet The Total stream impacts for this option are 428 linear feet.	The impacts to the streams located within this option are as follows: ❖ Perennial – 100 linear feet ❖ Intermittent – 333 linear feet The Total stream impacts for this option are 433 linear feet.	The impacts to the streams located within this option are as follows: ❖ Perennial – 120 linear feet ❖ Intermittent – 333 linear feet The Total stream impacts for this option are 453 linear feet.

WILL THERE BE ANY SECONDARY OR CUMULATIVE EFFECTS FROM THE PROJECT?

Cumulative impacts are decided by the Council on Environmental Quality (CEQ) as "*the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions.*" (CEQ 2005). Cumulative Effects can occur from repeated impacts resulting from a single project, added effects from multiple sources, or impacts resulting from the interactions of numerous sources. Secondary impacts are effects "*caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable*." (CEQ 2005). These are generally induced by the action and examples include growth and development and/or land use change.

A complete secondary and cumulative effects analysis is included in this EA as **Appendix G**. This Cumulative Effects Analysis incorporated information gathered from site visits and reviews of US Census data and local planning documents. A Secondary and Cumulative Effects study area and was delineated for the purpose of evaluating potential secondary and/or cumulative effects. The Secondary and Cumulative Effects study area was generally based on a 0.5-mile buffer of the Project and encompasses other planned or proposed projects including or in the vicinity of Greenbag Road (CR 857) (see **Figure 13** for the study area). The analysis evaluated potential Cumulative Effects that may occur through a horizon year of 2045, which is consistent with the current Metropolitan Transportation Plan (MMMPO 2017) planning horizon.

Potential for Secondary Impacts

Availability of land and transportation infrastructure in the Project area indicates that new development is most likely to occur along Greenbag Road (CR 857) at US 119, at Mountaineer Mall, east of Dorsey Avenue (CR 81) in neighborhoods surrounding Haymaker Forest, in the southeast quadrant of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), on the west side of Greenbag Road (CR 857) north of Lower Aarons Creek Road, and at Sabraton at the Greenbag Road (CR 857) intersection with WV-7 (Earl Core Road). Summaries of these locations are provided below:

- US 119 – This location provides convenient access to/from downtown Morgantown. There are several small parcels available for development along the segment of US 119 in the vicinity of the Greenbag Road (CR 857) intersection, and all utilities are available. This area is identified as a "Corridor Enhancement Area" in the City of Morgantown's *Comprehensive Plan* (2013) (i.e., where development may be improved with a mix of uses, increased intensity at major intersections, and roadway improvements to improve mobility for motorists and multimodal users).
- Mountaineer Mall – While this property was not identified as developable land, it is targeted for future infill, redevelopment, and encouraged growth according to the City of Morgantown's *Comprehensive Plan* (2013). Water

and sewer services are available at this location, it is accessible by public transit services, and it is convenient for motorists traveling into and out of Morgantown via US 119.

- East of Dorsey Avenue (CR 81), near Haymaker Forest – This location is primarily under Monongalia County's jurisdiction, and while water and sewer services are more limited than other areas of the Project area, utility lines surround the area. This region is also proposed for annexation under the City of Morgantown's Annexation Report (2019), and if the boundary expansion is approved, utility services would be provided in all newly-acquired areas as part of the agreement. A group of small parcels adjacent to each other were identified in this area as developable land. Local officials with the City of Morgantown desire to purchase the Haymaker Forest property and manage it as a reserve/greenspace; however, there are development plans to expand the neighborhoods to the north by constructing approximately 81 townhomes in this area. The development may encroach on the Haymaker Forest before the property obtains local government ownership and protection (WV Metro News 2019).
- In the southeast quadrant of Greenbag Road (CR 857) and Kingwood Pike (CR 81) – This area is under Monongalia County's jurisdiction and was identified in the City of Morgantown's *Comprehensive Plan* (2013) as an area of Controlled Growth (i.e., "developing areas, or currently undeveloped land where more growth is likely due to proximity to existing thoroughfares, infrastructure and adjacency to recent development"). Though development is not encouraged in this area and utility services are limited, three of the largest parcels within the Secondary and Cumulative Effects study area identified to be available for development are in this region, and they are adjacent to each other. More than 130 acres across six parcels in this area and on the west side of Kingwood Pike (CR 81) are held by one landowner. All six parcels were flagged as developable land.
- North of Lower Aarons Creek Road – Parcels on both sides of Greenbag Road (CR 857) north of Lower Aarons Creek Road, all within Monongalia County's jurisdiction, are available for development. Topographic constraints and limited water and sewer availability would restrict development to the west side of the corridor, which is already partially developed. The City of Morgantown identifies this as a Corridor Enhancement Area in their *Comprehensive Plan* (2013), and infill and/or redevelopment will likely occur in this area, especially if controlled growth in the Sabraton area to the north (see discussion below) occurs. As with the area east of Dorsey Avenue (CR 81), this region is proposed to be incorporated with Morgantown.
- Sabraton infill and redevelopment - Though outside of the Secondary and Cumulative Effects study area, the area along WV-7 (Earl Core Road) north and south of its intersection with Greenbag Road (CR 857) is also identified as a Corridor Enhancement Area. This area is targeted for encouraged growth according to the Conceptual Growth

Framework map (City of Morgantown 2013). Sabraton, located at the Greenbag Road (CR 857) intersection, is a designated “area of opportunity” in *The Comprehensive Plan*. The City of Morgantown envisions continued infill and redevelopment in this region as a mixed-use employment, retail, accommodation, and residential district.

Most areas within the portion of the Secondary and Cumulative Effects study area overlapping with the jurisdictional limits of Morgantown are targeted for infill or redevelopment of existing properties (City of Morgantown 2013). Exceptions include Mountaineer Mall and Sabraton, where growth is encouraged; the area south of Greenbag Road (CR 857) and east of Kingwood Pike (CR 81), where there is a local desire to control future growth; and areas targeted as preserves/open space, all areas within the portion of the Secondary and Cumulative Effects study area overlapping with the jurisdictional limits of Morgantown are targeted for infill or redevelopment of existing properties (City of Morgantown 2013).

The Project proposes improvements that will increase the capacity of the roadway, thereby improving access to the commercial node at the western terminus of the Project, to the commercial corridor along WV-7 east of the Project, to Sabraton, and to US 119, WV-7, and other major thoroughfares of Morgantown. By doing so, it will improve traffic mobility under existing conditions, allow the roadway to operate at an acceptable *LOS* for anticipated future growth (MMMPO 2017), and enhance users’ experiences. The benefits associated with the Project may stimulate the local or regional economy, but any change is not expected to be significantly different from current conditions.

As described above, developable land is present within 0.5 miles of the Project area. The area has experienced population and employment growth over the past decade (USCB 2018), a trend that is expected to continue (Lego and Deskins 2015), and local jurisdictions have plans and ordinances in place to effectively manage growth and development and protect natural resources within the Secondary and Cumulative Effects study area. Considering the overall scope and nature of the Project, it is not anticipated that the proposed Greenbag Road (CR 857) improvements would influence land use decisions or encourage land use changes.

While development is occurring within the Secondary and Cumulative Effects study area, there is no reason to believe a demand exists that would cause future growth to outpace intensities that have occurred in the recent past. Similarly, there is no indication that the construction of the Project would alter the patterns of future growth within the Secondary and Cumulative Effects study area. The presence of water and sewer services, available land for development that is unconstrained by topography, and convenient access to US 119 and other major thoroughfares through Morgantown are all factors that may encourage land use change in the vicinity of the Greenbag Road (CR 857) Corridor. While growth may occur, any development in the area is likely to occur regardless of if the Project is constructed or not. The Project study

area contains notable cultural and *environmental features*, including Cobun Creek, Aaron Creek, other intermittent and perennial streams, *100-year floodplains* associated with Cobun Creek and Aaron Creek, numerous wetlands, and impaired waters. These features are provided numerous protections under State, Federal, and local regulations, but risk being impacted by cumulative effects of the proposed Project and past and/or future actions.

While the Project improvements on their own may only result in minor impacts to the notable cultural, community, water quality, natural features, and habitat within the study area, they may contribute to other effects that have resulted from past actions, and/or to impacts that will occur from future planned actions. In order to evaluate the potential for, magnitude of, and interactions between these cumulative effects, past projects since 1989 and planned actions through the year 2045 were identified and evaluated qualitatively. Information was primarily sourced from local planning documents, study area field views, and a review of aerial imagery. Actions that may have contributed to cumulative effects in the area include, but are not limited to:

- Development or expansion of small commercial properties along US 119, and north of Greenbag Road (CR 857) near Mountaineer Mall
- Individual facility expansion at numerous locations along the corridor (e.g., South Middle School and Monongalia County Technical Education Center, municipal facilities, and the FCI)
- Extension of Distributor Drive and development at the end and on either side of the roadway
- Paving of the Morgantown Utility Board driveway off of Greenbag Road (CR 857)
- Construction of the Bluegrass Village development
- Development in the northwest quadrant of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)
- Construction of Mountainview Elementary
- Development of numerous single family and multifamily residences along Marcus Drive
- Construction of facilities and their respective access streets on the north side of Greenbag Road (CR 857), east of Luckey Lane (CR 81/6), serving residential (e.g., Ashworth Lane, Jonathan Lane, Long Branch Drive) and commercial uses.
- Construction of Glen Oaks Drive, south of the corridor, and residences accessed by that road.
- Construction of Harvest Family Worship Center, Covenant Christian School, and their paved access roads.

- Construction of numerous commercial facilities surrounding Greenbag Road (CR 857) north of Lower Aarons Creek Road.

In addition to past actions, potential cumulative effects of a proposed action were aggregated with other ongoing and reasonably foreseeable future actions (RFFAs). The identification of RFFAs is complicated by the fact that future actions are not always foreseeable, that planned actions are contingent upon funding security and/or preliminary planning actions, by the economic and political climates of the area, and by many other factors that can be impossible to predict.

Actions that may occur in the future and hold the potential to contribute to cumulative effects on terrestrial habitat, land use, water quality, wetlands, streams, air quality, traffic, and cultural resources within the Secondary and Cumulative Effects study area include:

- The White Park Caperton Trail Connection in the northern region of the Secondary and Cumulative Effects study area.
- Upgrades to:
  - WV-7 (Earl Core Road), including intersection with Greenbag Road (CR 857).
  - US 119 (Grafton Road).
  - Dorsey Avenue (CR 81) sidewalks.
  - Smithtown Road.
- Utility expansion and repaving along Mississippi Street (CR 857/1).
- Utility expansion across other areas proposed to be incorporated in the City of Morgantown.
- General water service line expansions with completion of the new Cobun Creek reservoir currently under construction, south of the Secondary and Cumulative Effects study area.
- Conversion of agricultural or forested land to be developed.

Any proposed development, whether it is transportation or utility-oriented, multimodal facility improvements, residential, or commercial in nature, can result in negative impacts to water quality, wetlands, habitat, wildlife, and/or cultural resources. There is risk of physical adverse impacts associated with any temporary or permanent ground disturbance, and any increase in impervious surface can result in impaired water quality which could translate to adverse impacts to aquatic habitat and wildlife. Construction activities in the short-term can also create negative impacts to air quality. At the same

time, construction and development activity generally occurs with an intent to avoid, minimize, and/or mitigate any adverse impacts to natural or cultural resources. This can result in new water or habitat features that could offset negative impacts, as well as potential for improved understanding of the status of threatened, rare, and endangered species. These projects may also provide opportunities for enhanced coordination between resource agencies and other stakeholders that may not have otherwise occurred, potentially resulting in improved management of the function and values of these natural and cultural resources at a broader level.

The physical ground disturbance that can be associated with multimodal facility improvements can result in mixed impacts to natural and cultural resources as described above. However, the overall impacts of such improvements would likely be positive. Recreational resources would improve, especially since planned actions described in the *Comprehensive Plan* (City of Morgantown 2013) and the *Metropolitan Transportation Plan* (MMMPO 2017) identify multimodal facilities improvements that would create direct connections between parks, schools, and residential areas. Air quality would improve if the availability of multimodal facilities cause motorists to opt for active forms of transportation instead of vehicles. Any reduced congestion that might result from that shift would improve air quality. Socioeconomics may improve if the multimodal facility improvements enhance access between residential areas and employment or commercial opportunities.

Besides the previously-described mixed impacts to natural and cultural resources, water and sewer enhancements would result in a positive impact to water quality, recreational resources, and socioeconomics. Sewer systems that are designed to an appropriate capacity are less likely to fail. This impact would therefore offset any negative impact the disturbance would cause to water quality. The presence of adequate utilities is also essential for the health, well-being, and attractiveness of a community. The availability of adequate services increases the likelihood for development and creates a desirable area to live and work in, which would in turn result in a positive effect on the socioeconomics of an area.

Transportation system improvements that are described in the local planning documents generally propose widening and/or new access facilities, construction of which would likely result in mixed impacts to natural and cultural resources as described previously. If these improvements result in overall travel time savings and/or reduced congestion, they could also contribute to air quality improvements over time due to reduced emissions sourced from motorized vehicles. There is potential for mixed access impacts to recreational, socioeconomic, and/or cultural resources, since even at the individual project level different areas can experience positive or negative access impacts.

The mixed impacts associated with the construction of new commercial and/or residential areas could be offset by any positive socioeconomic impacts that occur as a result of these developments. These actions may also result in negative

impacts to notable resources if population increases result, causing a rise in demand for transportation facilities and recreational, cultural, and community resources.

The regulatory environment is expected to result in a positive impact to water quality, wetlands, streams, terrestrial habitat, wildlife, air quality, recreational resources, socioeconomics, and cultural resources. Federal, state, and local regulations are in place to protect natural, cultural, and socioeconomic resources. Although cumulative effects associated with the Project are possible as described above, the City of Morgantown has demonstrated planning and policy initiatives over the past decade to preserve and protect important resources under its jurisdiction from pressures associated with growth and development. A concerted effort by government and the private sector has also occurred over the past decade to plan for growth and redevelopment and protect human and natural environmental resources. Local jurisdictions have plans and ordinances in place to effectively manage development and protect natural resources within the Secondary and Cumulative Effects study area. Considering the overall scope and nature of the Project, it is not expected to influence land use decisions or induce land use change.

The combined effects of this Project when considered in the context of other past, present, and future actions, and the resulting impacts on the human and natural features within the Secondary and Cumulative Effects study area, will likely minimally contribute to cumulative impacts to environmental resources in the Secondary and Cumulative Effects study area. Direct impacts by WVDOH projects will be addressed by avoidance, minimization, or mitigation consistent with programmatic agreements with the respective resource agencies during the permitting process. All developments will be required to follow local, state, and federal guidelines and permitting regulations.

WHAT ARE THE COSTS ESTIMATED FOR THE ALTERNATIVES?

Estimated construction costs were developed for both alternatives and each of the options. **Tables 8 and 9** below show the estimated costs for each of the alternatives with all possible combinations of the intersection options. The cost for the preferred alternative is highlighted in **Table 9**.

Table 8: Estimated Construction Costs for Alternative 1

		Dorsey Avenue/Kingwood Pike Intersection Options		
		D	E	F
Mississippi Street Intersection Options	A	$12,689,979.44	$13,249,895.68	$10,755,399.35
	B	$13,125,555.10	$13,685,471.34	$11,190,975.01
	C	$13,074,839.27	$13,634,755.51	$11,140,259.18

Table 9: Estimated Construction Costs for Alternative 2

		Dorsey Avenue/Kingwood Pike Intersection Options		
		D	E	F
Mississippi Street Intersection Options	A	$11,238,152.91	$11,792,156.83	$9,842,019.50
	B	$11,642,971.91	$12,196,975.83	$10,246,838.49
	C	$11,825,328.90	$12,379,332.83	$10,429,195.49

IDENTIFICATION OF A PREFERRED ALTERNATIVE

All *alternatives* and intersection *options* were screened to determine level of impacts to businesses and residences within the Project area. Consideration was also given to the improvement predicted for the *LOS* from current year to design year 2048 (**Table 10**).

Table 10: Alternatives Screening

	Alternatives			**Mississippi Street Intersection Options**			**Dorsey Avenue Intersection Options**		
	1	2	No Build	A	B	C	D	E	F
Businesses Taken	0	0	No impact	0	0	0	0	0	0
Residences Taken	1	0	No impact	0	0	0	2	3	0
LOS (AM/PM)	*Controlled by LOS at major intersections*	*Controlled by LOS at major intersections*	D/F	A/B	B/A	A/A	C/E	C/C	B/C

From the range of *alternatives* and intersection *options* considered, Alternative 2 with intersection options C and F is identified as the preferred *alternative*. The *alternative* impacts fewer residences and provides for more improvement to the flow of traffic through the corridor.

Summary Of Impacts From The Preferred Alternative

Figure 14 provides detailed figures showing the preferred *alternative* along with information related to environmental features and the built environmental. **Table 11** provides a summary of all of the impacts for the preferred *alternative*, combining the *alternative* (2) with both of the intersection *options* selected (C and F).

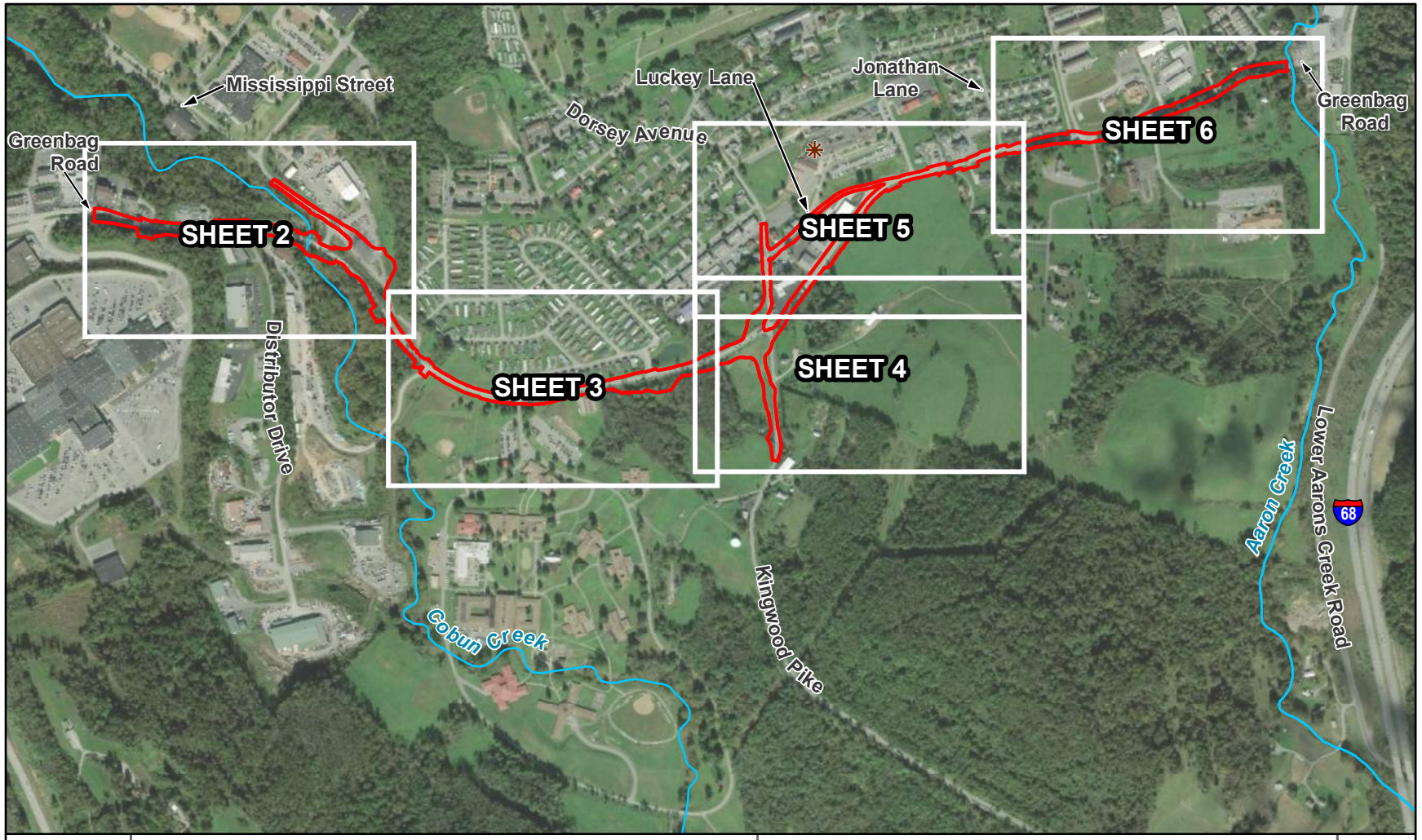


Figure 14 (Sheet 1 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement
Data Sources: ESRI (2018), USGS (2017)

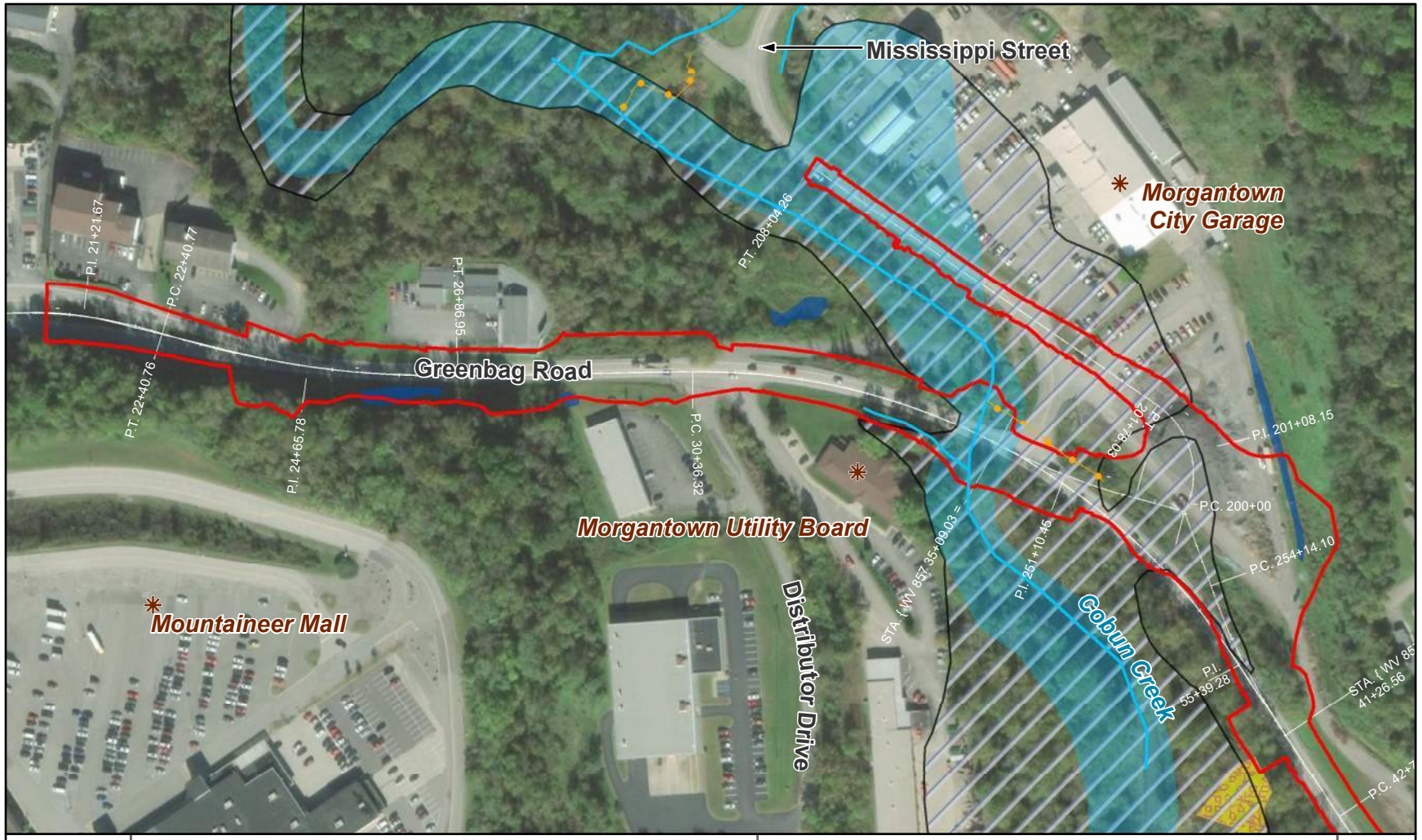


Figure 14 (Sheet 2 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement
Data Sources: ESRI (2018), USDHS (2015)

Limits of Disturbance
NRHP Eligible Resource
Productive Agriculture
Point of Interest
Intermittent Stream
Perennial Stream
Floodway
100-year Floodplain
Palustrine Emergent Wetland
Palustrine Forested Wetland
Palustrine Scrub/Shrub Wetland



Figure 14 (Sheet 3 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)



Figure 14 (Sheet 4 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

Data Sources: ESRI (2018), USDHS (2015)

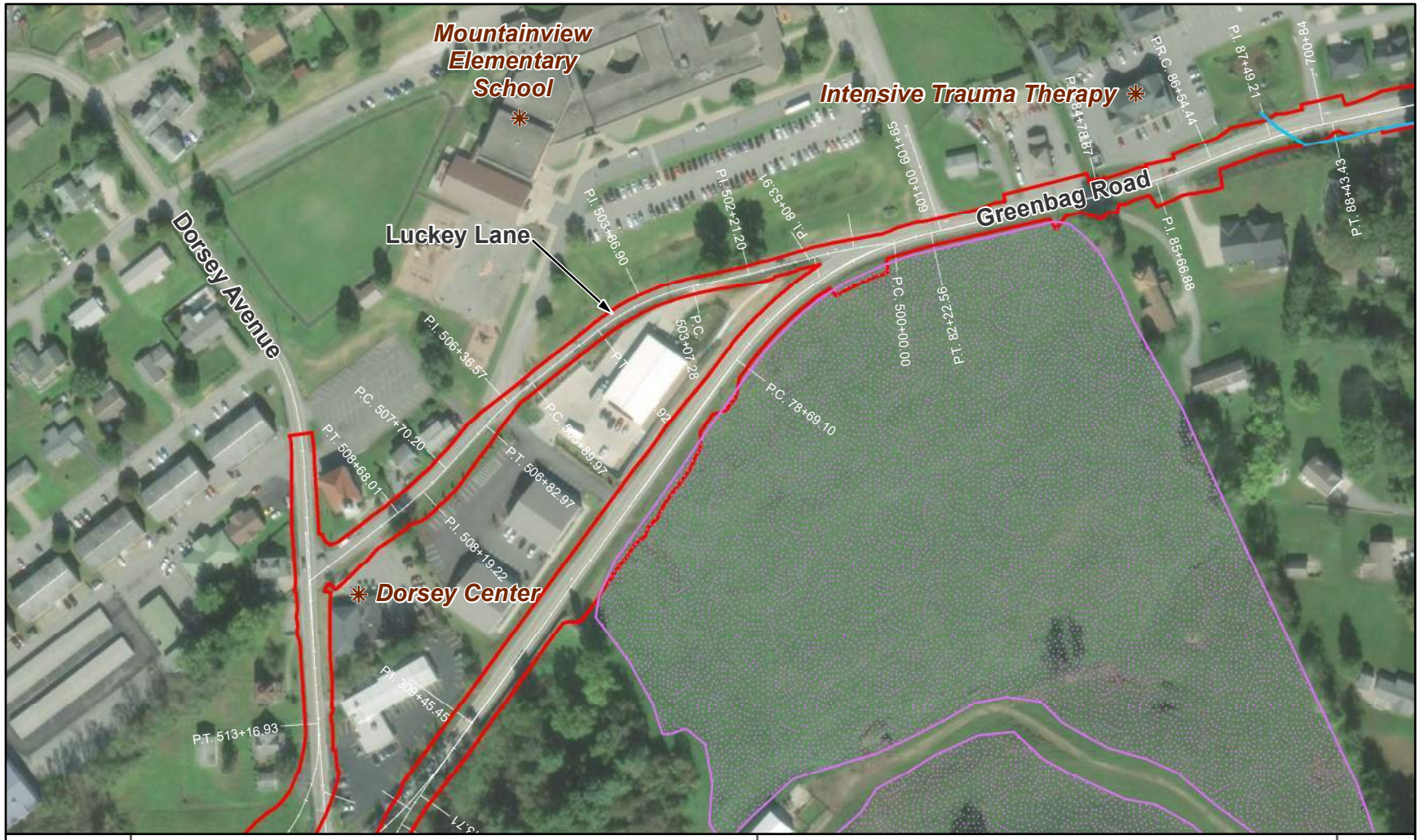


Figure 14 (Sheet 5 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement
Data Sources: ESRI (2018), USDHS (2015)

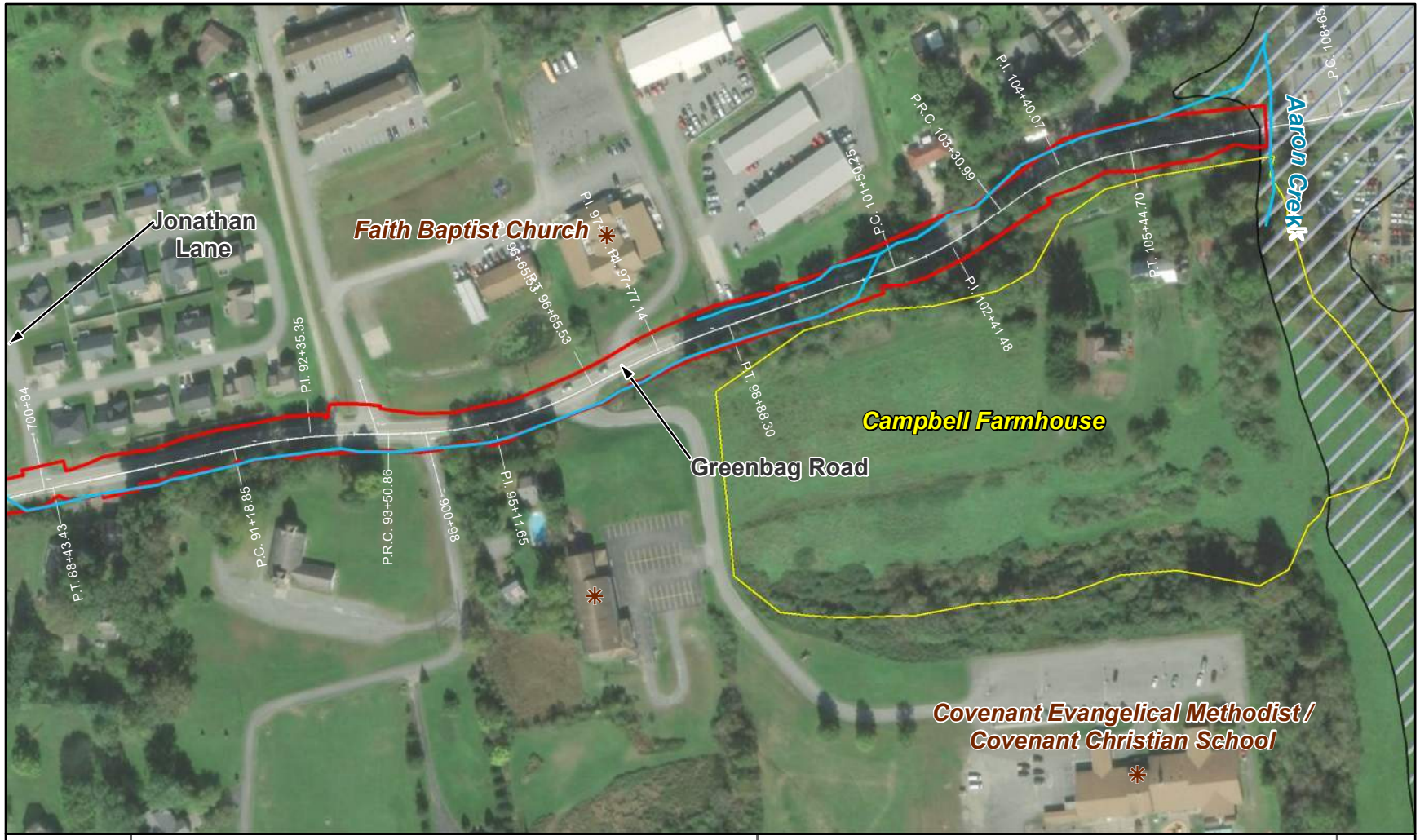


Figure 14 (Sheet 6 of 6)
Detailed Environmental Features Map
Preferred Alternative 2, Options C / F
West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement
Data Sources: ESRI (2018), USDHS (2015)

Limits of Disturbance
NRHP Eligible Resource
Productive Agriculture
Point of Interest
Intermittent Stream
Perennial Stream
Floodway
100-year Floodplain
Palustrine Emergent Wetland
Palustrine Forested Wetland
Palustrine Scrub/Shrub Wetland

0 500 1,000 2,000 Feet

N

Table 11: Summary of Impacts From the Preferred Alternative (2 / C / F)

Resource or Elements	Preferred Alternative 2 / C / F
Environmental Justice	All *block groups* immediately adjacent to the Project meet thresholds indicating a presence of EJ populations. While adverse impacts are anticipated under this *alternative*, all are expected to be minor and/or temporary and all impacts affect non-EJ and EJ populations equivalently. Impacts include right-of-way takes, parking impacts to facilities, expanded access at Bluegrass Village, tree removal, access during construction, and improved bicycle/pedestrian access.
Displacements	There would be no relocations for residential or commercial properties under the preferred *alternative*.
Community Facilities and Services	The expanded roadway widths and turning lane will improve traffic capacity and provide for increased mobility. Vehicle travel through the corridor will be more efficient. Non-motorized access to community services will be enhanced through the presence of the sidewalks and increased roadway shoulders for bicycle use.
Community Cohesion	The improved multimodal connectivity between residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.
Farmlands	This *alternative* will impact 5.7 acres of *Farmland of Statewide Importance* soil and 1.1 acres of Prime Farmland soil. Of these acres, 3.7 acres of *Farmland of Statewide Importance* soil and 1 acre of Prime Farmland soil have been previously developed.
	This *alternative* will result in an impact of 0.07 acres to the Thomas E. Richards Trust Farm. This sliver take of the property will not result in a change to the existing operations and is assumed to be considered insignificant.
Land Cover	The Project will impact the following land cover types: ❖ Developed land (low intensity: 1.1 acres; medium intensity: 2.6 acres; high intensity: 2.0 acres) ❖ Pasture – 0.2 acres ❖ Deciduous forest – 0.5 acres ❖ Developed open space – 0.2 acres
RTE Species	No Impact

Table 11: Summary of Impacts From the Preferred Alternative (2 / C / F) (continued)

Resource or Elements	Preferred Alternative 2 / C / F
Streams	The impacts to the streams located within this *alternative* are as follows: ❖ Perennial – 2,953 linear feet ❖ Intermittent – 753 linear feet The total stream impacts for this *alternative* are 3,706 linear feet.
Wetlands	Three wetlands will be impacted by this *alternative*. The impacts to the wetlands located within the Project area are as follows: ❖ Palustrine Emergent – 0.06 acres ❖ Palustrine Forested – 0.04 acres The total wetland impacts for this *alternative* are 0.1 acres.
Floodplains	The Project will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.
Groundwater	No Impact
Air Quality	No Impact
Noise	The noise analysis report indicates the Greenbag Road and intersection improvements for this *alternative* do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and no noise analysis for highway traffic noise impacts is required.
Potentially Hazardous Waste	The Morgantown City Garage has been identified as an area of concern. The WVDOH has committed to completing a *Phase I Environmental Site Assessment* for the Project area once right-of-way impacts to the property are defined. The results of that assessment will be documented in the FONSI.
Historic Resources	No Adverse Effect
Archaeological Resources	No Impact
Utilities	Several utility lines and associated components will be relocated.

Table 11: Summary of Impacts From the Preferred Alternative (2 / C / F) (continued)

Resource or Elements	Preferred Alternative 2 / C / F
Section 4(f) Resources	Two NRHP-eligible resources were identified within the Project vicinity. The Campbell Farmhouse will not have direct impacts to the property. There will be no right-of-way acquired from the FCI Morgantown facility, thereby resulting in No Use of the Section 4(f) resource.
Temporary Construction Impacts	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of traffic controls, detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property. An erosion and sediment pollution control plan will be prepared and implemented for the Project to eliminate or minimize sedimentation.

HOW WELL DOES THE PREFERRED ALTERNATIVE MEET PURPOSE AND NEED?

In considering the purpose and need for the Project, Alternative 2 C / F was compared to the *No Build Alternative* to determine whether the benefits of the Project warrant the expenditure of public funds. The results of the comparison are displayed in **Table 12**.

Table 12: Comparison of Preferred and No-Build Alternatives to Purpose and Need

Purpose and Need Element	Preferred Alternative (2 C / F)	No Build
Traffic Congestion	Highway operations will be improved with this alternate. The *LOS* will be improved to an overall B for AM and C for PM.	Expected growth in the region will negatively impact the flow of traffic increasing point-to-point travel times accessing all destinations along the Project corridor. The *LOS* is expected to degrade to D/F.
Non-motorized connections	The addition of sidewalks and shoulders for bicycle use between the residential areas along Greenbag Road with schools, recreational resources, commercial resources, and transit services will result in a permanent positive access impact to all populations within the Project area.	Safe bicycle and pedestrian facilities connecting residential areas with community resources within and beyond the Project area would remain nonexistent.

MITIGATION OF IMPACTS FROM THE PREFERRED ALTERNATIVE

Mitigation commitments proposed by the WVDOH to lessen permanent and temporary impacts are shown in **Table 13**. Additional measures may be proposed during final design to avoid or minimize permanent and temporary impacts.

Table 13: Mitigation Commitments

Resource or Elements	Impact	Mitigation Commitment
Environmental Justice	Impacts include right-of-way takes, parking impacts to facilities, tree removal, and access during construction.	The WVDOH will stipulate in the final design specifications the replacement of trees in kind between Bluegrass Village and the roadway after construction has been completed. Representatives of WVDOH will coordinate with the City of Morgantown and Monongalia County to ensure full and fair participation of all potentially-affected communities in the transportation decision-making process.
Land Cover	The preferred *alternative* will convert approximately 0.7 acres of non-built up land to highway use.	Prior to earth disturbing activities, an approved Erosion and Sediment Pollution Control Plan and appropriate best management practices (BMPs) will be implemented/installed to avoid unintentional impacts to resources beyond the proposed limits of construction. This will also minimize potential impacts to water quality and stream habitat throughout the Project area. Disturbed areas will be revegetated with a native seed mixture after construction. Furthermore, the limits of construction for the Project have been reduced to the greatest extent possible while still meeting the Project Purpose and Need.
Streams	The preferred *alternative* will impact a total of 3,706 linear feet of streams. Impacts will be the result of roadway widening and the replacement or extension of drainage ditches, drainage pipes, and culverts.	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific BMPs will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary.
RTE Species	In channel work in Cobun Creek	If in channel work is set to occur in Cobun Creek between April 1 and June 30, the WVDOH will request a spawning waiver from the WVDNR.

Table 13: Mitigation Commitments (continued)

Resource or Elements	Impact	Mitigation Commitment
Wetlands	The preferred *alternative* will impact three wetlands resulting in an impact of 0.1 acres. Most of the impact wetlands are identified as PEM.	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to jurisdictional wetlands. If necessary, unavoidable impacts will be mitigated through the purchase of appropriate wetland banking credits or payments to the state's in-lieu fee program.
Floodplains	The preferred *alternative* will impact a total of 1.3 acres defined as regulated floodplain at the Cobun Creek crossing.	During final design, measures will be identified to minimize and avoid impacts to floodplains. The WVDOH will apply for a Monongalia County Floodplain permit prior to any construction.
Noise	Sound levels may be temporarily increased during construction.	Noise generating construction activities such as pile driving or jack hammering should be minimized and completed during daytime activities. Mufflers will be installed on equipment to minimize temporary noise impacts during construction. The permanent condition of the existing noise environment is not anticipated to change following construction.
Utilities	Utility relocations will be required as a result of the Project.	Coordination with utility operators will be required. The WVDOH has detailed procedures for coordinating with impacted utilities and the relocations will be completed prior to construction with limited inconvenience to the public.
Potentially Hazardous Waste	The Morgantown City Garage is an area of concern. Exact impacts will be defined upon completion of the *Phase I Environmental Site Assessment.*	To be determined upon completion of the *Phase I Environmental Site Assessment*
Temporary Construction Impacts	Construction will create short-term impacts related to increased noise and air pollution, erosion, and traffic delays or detours.	Access will be maintained to all properties during construction. The flow of traffic will be maintained through the use of detours or temporary signals or flaggers to minimize disruptions. Construction will comply with all federal, state, and local laws regarding safety, health, and sanitation. Contractors will follow Occupational Safety and Health Administration guidelines to protect employees, the public, and property.

RESOURCE AGENCY COORDINATION

The WVDOH has coordinated with environmental resource agencies throughout the development of the Project. Agencies involved in the Project to date include the FHWA, the WVDEP, the West Virginia Division of Culture and History (WVDCH), and the WVDNR. Correspondence with these agencies and public officials related to the Project are attached in **Appendix D**. Coordination with these agencies, officials, and others will continue during the development of the Project.

REQUIRED PERMITS

The following permits will be required prior to construction:

- Clean Water Act Section 404 Permit from the US Army Corps of Engineers
- Clean Water Act Section 401 Certification from the West Virginia Department of Environmental Protection
- Monongalia County Floodplain Development permit
- National Pollutant Discharge Elimination System permit from the WVDEP

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GLOSSARY OF TERMS

- *100-year floodplain* – land that is predicted to flood during a 100-year storm, which is a flood that statistically has a 1-percent chance of occurring in any given year (USGS 2019).
- *Alternative* – indicates the differing design plans that are considered to address the purpose and need statement for the Project. In this EA, the alternatives do not include any design changes at the two major intersections.
  - *Build alternative* – designs that involve construction. For this Project, Alternatives 1 and 2 are the Build Alternatives.
- *Block Group* – A statistical subdivision of a census tract, generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units, and the smallest geographic unit for which the Census Bureau tabulates sample data (USCB 2019a).
- *Census Tract* – A small, relatively permanent statistical subdivision of a county delineated by a local committee of census data users for the purpose of presenting data. Census tracts nest within counties, and their boundaries normally follow visible features, but may follow legal geography boundaries and other non-visible features in some instances. Census tracts ideally contain about 4,000 people and 1,600 housing units (USCB 2019a).
- *Curb and gutter* – the area between the roadway and sidewalk designed for water runoff and providing a barrier for safety of pedestrian and vehicular traffic (Law Insider 2019).
- *Environmental features* – the environmental, cultural, community, and Section 4(f) resources within the delineated area that are evaluated for impacts.
- *Environmental Justice (EJ) populations* – minority and low income populations.

- *Farmland Protection Policy Act* – The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses (USDA NRCS 2019b).
- *Farmland of Statewide Importance* – include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods (USDA NRCS 2019c).
- *Level of service (LOS)* – is a performance metric which started when the US began building freeways in the 1950s. LOS uses a scale of A to F based on an objective formula that tries to answer the question, "How much congestion are we willing to tolerate?" (Dunn 2019).
    - A: free flowing traffic
    - B: reasonably free flowing traffic
    - C: stable flow, at or near free flowing traffic
    - D: approaching unstable flow of traffic
    - E: unstable flow, operating at capacity
    - F: forced or breakdown flow of traffic
- *Non-motorized connections* – modes of transportation that do not rely on motorized vehicles.
- *NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Project* – form used for assessing farmland conversion impacts for corridor projects.
- *Option* – for this EA, options indicate the range of considered possibilities for improvements to the intersections. Each option can be selected independently of the alternative selected or the option selected for the other intersection.
- *Permissive turn/phase* – Permissive only operation requires left-turning drivers to yield to oncoming vehicles and pedestrian traffic streams before completing the turn (USDOT FHWA 2017). This phase is indicated with a green traffic signal.
- *Phased traffic signal* – Each phase at an intersection has a set of timing, possibly containing vehicle and pedestrian timing. A phase may control both a through movement and a right turn movement on an approach (USDOT FHWA 2017).

- *Phase I Environmental Site Assessment* – The ESA process establishes reasonable assurance that no hazardous wastes, other wastes, or unacceptable hazards exist; or that existing hazardous wastes are manageable (USDOT FAA 2019).
- *Protected turn/phase* – Protected only operation assigns the right-of-way to drivers turning left at the intersection and allows turns to be made only on a green arrow display (USDOT FHWA 2017). This phase is indicated with a green arrow on the traffic signal.
- *SAFETEA-LU* – 2007 Federal transportation appropriation bill, replaced by FAST ACT in 2015.
- *Section 4(f)* – Federal laws stipulate that FHWA cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent avoidance alternative to the use of land and the action includes all possible planning to minimize harm to the property resulting from such use or FHWA determines that the use of the property will have a *de minimis* impact.
- *Title VI Resources* – Title VI of the Civil Rights Act of 1964, prohibits discrimination based upon race, color, and national origin. Specifically, 42 USC 2000d states that *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*" The use of the word "*person*" is important as the protections afforded under Title VI apply to anyone, regardless of whether the individual is lawfully present in the United States or a citizen of a State within the United States.
- *Title 46 and the West Virginia Surface Mining Rules* – provides the definitions for surface water as perennial streams, intermittent streams, or ephemeral streams.
- *Truck apron* – A truck apron is the mountable portion of the central island used to accommodate the turning path of a design vehicle larger than a passenger vehicle or BUS, and helps to minimize the overall footprint of the roundabout. Generally, the truck tractor can traverse the roundabout in the circulating lane while the trailer is allowed to off track onto the apron. The apron is raised above the circulating path to provide guidance for drivers in the circulating lane (WSDOT 2019).

LIST OF ACRONYMS

BG	Block group	NLCD	National Land Cover Database
BMP	Best management practices	NRCS	Natural Resources Conservation Service
CAA	Clean Air Act	NRHP	National Register of Historic Places
CEQ	Council on Environmental Quality	NWI	National Wetland Inventory
CE	Categorical Exclusion	PEM	Palustrine Emergent
CT	Census tract	RFFA	Reasonably foreseeable future actions
EA	Environmental Assessment	RTE	Rare, Threatened, and Endangered
EJ	Environmental Justice	SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
ESRI	Environmental Systems Research Institute	SHPO	State Historic Preservation Office
FCI	Federal Correctional Institution	STIP	State Transportation Improvement Plan
FEMA	Federal Emergency Management Agency	USACE	United States Army Corps of Engineers
FHWA	Federal Highway Administration	USCB	United States Census Bureau
FONSI	Finding of No Significant Impact	USDA	United States Department of Agriculture
FTA	Federal Transit Administration	USFWS	United States Fish and Wildlife Service
HERS-ST	Highway Economic Requirements System	USGS	United States Geologic Survey
LOS	Level of service	WVDCH	West Virginia Division of Culture and History
MMMPO	Monongalia Morgantown Metropolitan Planning Organization	WVDEP	West Virginia Division of Environmental Protection
MTP	Metropolitan Transportation Plan	WVDNR	West Virginia Division of Natural Resources
NEPA	National Environmental Policy Act	WVDOH	West Virginia Division of Highways

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DISTRIBUTION LIST

Federal, state, and local agencies with jurisdiction over transportation projects and relevant environmental regulations have received or will receive a copy of this EA to review. The WV State Senators and Delegates representing the Project area will also receive a copy for review. All entities receiving a copy are presented below.

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Greenbag Road Improvement Project

Appendix A

Public Involvement Summary Report

INFORMATIONAL WORKSHOP

PUBLIC MEETING REPORT

Greenbag Road Improvement Project
Monongalia County, WV

West Virginia Department of Transportation

Division of Highways

State Project U331-857-0.67

Federal Project NFA-2317(022)D

May 2019

Revised August 2020

MARKOSKY

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Comments Summary.....2

Attachments

Public Meeting Flyer
Public Meeting Comment Form
Public Meeting Sign-in Sheet
Public Meeting Handout

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3	**Response to Comments**	57-112

GREENBAG ROAD IMPROVEMENT PROJECT, MONONGALIA COUNTY, WEST VIRGINIA

STATE PROJECT: U331-857-0.67, FEDERAL PROJECT: NFA 2317(022)D

Summary of April 16, 2019 Public Meeting Informational Workshop and Comments

Summary of Meeting

The West Virginia Department of Transportation, Division of Highways (WVDOH) hosted a public meeting informational workshop to inform the public and receive comments for the proposed Greenbag Road Improvement Project. The project proposes improvements and upgrades to the Greenbag Road (CR 857) corridor between Jonathan Lane and ¼ mile west of the intersection with Mississippi Street.

The meeting was held at the South Middle School at 500 East Parkway Drive in Morgantown, West Virginia on April 16, 2019 from 4:00 to 7:00 PM. The meeting location was approximately ¼ mile north of the Mississippi Street intersection of the proposed project area.

WVDOH advertised the meeting in local papers and hand delivered flyers to the surrounding community residents and businesses. The Morgantown Metropolitan Planning Organization and the City of Morgantown posted notices of the meeting online. At the meeting, handouts with information on the proposed project were provided at the registration table. In the school lunchroom there were two sets of seven (7) project boards as well as two sets of roll plots available for public review, provided by Stahl Sheaffer Engineering and The Markosky Engineering Group. WVDOH representatives were in attendance to answer questions. Representatives from the District Right-of-Way were not able to attend but WVDOH provided a Right-of-Way informational booklet and contact information for the District Right-of-Way agent when specific inquiries arose regarding right-of-way.

A 30-day comment period followed the public meeting, with comments due to WVDOH by May 16, 2019. Comment forms were attached to the handouts at the meeting and were available online, before the meeting and during the comment period, on the WVDOH website. Given the volume of public response the comment period was extended to May 21, 2019 in order to capture all of the submitted responses.

Attendance

Fifty-two individuals signed the attendance sheet at the meeting.

Public Discussion during the Meeting

The top concerns expressed by the local public attendees during the meeting were the amount and location of the right-of-way to be acquired for the roundabouts, the truck and car detour routes during construction, and the removal of a community garden.

Community users familiar with the community garden indicated that an eagle had been spotted in the area and inquired about an eagle nest survey. Another specific concern raised was related to the tree line currently separating Bluegrass Village from Greenbag Road regarding if the trees would be replaced if damaged or removed during construction.

Total Comments

Two hundred sixty-three (263) comments were received by WVDOH. Of these, eight (8) were submitted during the public meeting, two hundred fifteen (215) were submitted via the online system, and thirty-one (31) were mailed to WVDOH. The remainder were a combination of emails, voicemails, letters to the editor, and newspaper advertisements. Details for each comment are provided in Table 1. Comments and concerns are provided in Table 2. Where possible the comments are provided verbatim. Any comments that have been summarized are marked as such.

Comments Summary

Of the total comments received, nineteen (19) demonstrated support for the project as currently designed. The remainder expressed concerns related to the design, detour, and necessity of the project. The most frequently mentioned concerns were:

- The use of turn lanes instead of a roundabout at the Greenbag Road and Dorsey Ave/Kingwood Pike intersection
- Impacts to the community garden
- Prioritizing road repair both locally and within the county over improvements to the Greenbag Road corridor
- The use of traffic signals at the intersections instead of roundabouts
- Concerns related to the detour route including length and conditions of the roadways to be used
- Requests for an Environmental Impact Statement or Environmental Assessment instead of a Categorical Exclusion
- A desire to see additional alternatives presented
- Returning the Greenbag Road and Dorsey Ave/Kingwood Pike intersection to a 4-way stop

Table 1: Comment Details

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Cain	Roger		Morgantown	WV	Comment Form	4/16/2019	1
Downey	Ken				Comment Form	4/16/2019	2
Geass	Marc				Comment Form	4/16/2019	3
No Name	No Name				Comment Form	4/16/2019	4
Radman	Scott				Comment Form	4/16/2019	5
Selin	Jenny	City of Morgantown	Morgantown	WV	Comment Form	4/16/2019	6
Talerico	Tom		Morgantown	WV	Comment Form	4/16/2019	7
Whitmore	Josh	City of Morgantown			Comment Form	4/16/2019	8
Pardey	Sara		Morgantown	WV	Mailed Form	4/22/2019	9
Holipsky	Edward		Morgantown	WV	Online Form/Mailed Form/Email	4/29/2019	10
Talerico	Tom		Morgantown	WV	Letter to the editor	4/29/2019	11
Hall	Hazel		Morgantown	WV	Mailed Letter	5/2/2019	12
Lee	Richard		Morgantown	WV	Mailed Form	5/2/2019	13
Joseph	Janet		Morgantown	WV	Mailed Letter	5/6/2019	14
Brockett	Kevin		Morgantown	WV	Mailed Letter	5/8/2019	15
Hastings	Dewey		Morgantown	WV	Mailed Form	5/10/2019	16
Everly	Ann		Morgantown	WV	Mailed Form	5/12/2019	17
Hastings	Dewey		Morgantown	WV	Mailed Letter	5/13/2019	18
Hastings	Dewey		Morgantown	WV	Mailed Email	5/13/2019	19
Hastings	Dewey		Morgantown	WV	Mailed Form	5/13/2019	20
Hastings	Mary		Morgantown	WV	Mailed Letter	5/13/2019	21

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Korf	Mary		Fairmont	WV	Mailed Form	5/13/2019	22
Moore	Ryan		Morgantown	WV	Mailed Form	5/13/2019	23
Morgan	Alice		Morgantown	WV	Mailed Letter	5/13/2019	24
Richards	Garrett		Morgantown	WV	Mailed Form	5/13/2019	25
Gallagher	Glenn		Westover	WV	Mailed Form	5/15/2019	26
Post	Dominion				Newspaper Advertisement	5/15/2019	27
Post	Dominion				Newspaper Advertisement	5/15/2019	28
Post	Dominion				Newspaper Advertisement	5/15/2019	29
Ware	Henry				Email	5/15/2019	30
Chivers	Adam		Morgantown	WV	Email	5/16/2019	31
Hastings	Dewey		Morgantown	WV	Mailed Form	5/17/2019	32
Talerico	Tom		Morgantown	WV	Mailed Letter	5/17/2019	33
Dias	James		Morgantown	WV	Mailed Form	5/20/2019	34
G.	Alan		Morgantown	WV	Mailed Form	5/20/2019	35
Hastings	Grant		Morgantown	WV	Mailed Form	5/20/2019	36
I.	Brittney		Morgantown	WV	Mailed Form	5/20/2019	37
K.	Shawn		Morgantown	WV	Mailed Form	5/20/2019	38
Lassiter	Cassidy		Morgantown	WV	Mailed Form	5/20/2019	39
Leann	Lehing		Morgantown	WV	Mailed Form	5/20/2019	40
Mason	Belle		Morgantown	WV	Mailed Form	5/20/2019	41
Mason	Rebecca		Morgantown	WV	Mailed Form	5/20/2019	42
No Name	No Name				Copy of letter to the editor	5/20/2019	43
Popp	Felicia		Morgantown	WV	Mailed Form	5/20/2019	44

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
S.	Jordan		Morgantown	WV	Mailed Form	5/20/2019	45
	Bryon		Morgantown	WV	Mailed Form	5/20/2019	46
Hastings	Mary		Morgantown	WV	unknown	unknown	47
Abarca	Fatima		Broadlands	VA	Online Form		48
Adkins	Leah		Morgantown	WV	Online Form		49
Alshallah	Hasan			WV	Online Form		50
Ardnt	Camille			WV	Online Form		51
Ardnt	Camille			WV	Online Form		52
Ault	Jenny		Morgantown	WV	Online Form		53
Austin	Katherine		Morgantown	WV	Online Form		54
Bacorn	Amy		Morgantown	WV	Online Form		55
Bakhurin	Konstantin		Durham	NC	Online Form		56
Ballard	Donna			WV	Online Form		57
Beach	Robert	Senator			Mailed Form	5/20/2019	58
Beavers	Matt	Morgantown police Dept	Morgantown	WV	Online Form		59
Beavers	Kelli		Reedsville	WV	Online Form		60
Blaney	Mark		Morgantown	WV	Online Form		61
Bolyard	Gerald		Reedsville	WV	Online Form		62
Bolyard	Roseann		Reedsville	WV	Online Form		63
Bolyard	Sheila		Morgantown	WV	Online Form		64
Bowers	Rosella		Morgantown	WV	Online Form		65
Bowers	Timothy		Morgantown	WV	Online Form		66
Bowman	Alice			WV	Online Form		67
Boyers	Erin		Morgantown	WV	Online Form		68
Bradley	Holly	Gesundheit Institute	Hillsboro	WV	Online Form		69
Bradley	Michael		Morgantown	WV	Online Form		70

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Bramer	Karl			WV	Online Form		71
Brockett	Rhonda		Morgantown	WV	Online Form		72
Burghy	William		Morgantown	WV	Online Form		73
Call	Ashlin		Morgantown	WV	Online Form		74
Callegari	Joe			WV	Online Form		75
Candella	Erica		Morgantown	WV	Online Form		76
Chapman	Chelsey		Louisville	KY	Online Form		77
Chapman	Chelsey		Louisville	KY	Online Form		78
Childs	Silas		Morgantown	WV	Online Form		79
Chivers	Adam		Morgantown	WV	Online Form		80
Christensen	Gigi			WV	Online Form		81
Christie	Matt			WV	Online Form		82
Clark	Carol		Morgantown	WV	Online Form		83
Clark	Carol		Morgantown	WV	Online Form		84
Clawsun	Grace			CO	Online Form		85
Cole	Stacey		Morgantown	WV	Online Form		86
Collier	Paulina		Morgantown	WV	Online Form		87
Cope	Taylor	Conscious Harvest Cooperative LLC Community Garden	Morgantown	WV	Online Form		88
Corbin	Cassi			WV	Online Form		89
Cox	Madison		Morgantown	WV	Online Form		90
Cross	Hannah			WV	Online Form		91
Cummings	Ann			WV	Online Form		92
Cummings	Stephen		Morgantown	WV	Online Form		93
Dailey	Penny		Morgantown	WV	Online Form		94

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Dakan	Laurel		Morgantown	WV	Online Form		95
Dalton	Judith		Morgantown	WV	Online Form		96
Dalton	Mary			WV	Online Form		97
Dalton	Amy		Morgantown	WV	Online Form		98
Davis	Erica		Morgantown	WV	Online Form		99
Davis	Tara		Morgantown	WV	Online Form		100
Davis	Tara		Morgantown	WV	Online Form		101
Dennison	Damian		Morgantown	WV	Online Form		102
Deshield	Quentine	MPS	Morgantown	WV	Online Form		103
Dohn	Kevin		Louisville	KY	Online Form		104
Don	D			WV	Online Form		105
Downey	Jan		Morgantown	WV	Online Form		106
Fabry	David		Morgantown	WV	Online Form		107
Fidler	Donald	self	Morgantown	WV	Online Form		108
Flores	Hope			WV	Online Form		109
Fraley	Stephanie		Louisville	KY	Online Form		110
Freeman	Brenda			WV	Online Form		111
Glover	Arlene		Masontown	WV	Online Form		112
Goodwin	Tricia	3c's Hair Salon	Reedsville	WV	Online Form		113
Govindan	Megan	West Virginia University	Morgantown	WV	Online Form		114
Greene	Ashley		Morgantown	WV	Online Form		115
Gribble	Bryan		Morgantown	WV	Online Form		116
Griffith	Patrick	Hemp farmer	Morgantown	WV	Online Form		117
Gyorko	Brenda		Morgantown	WV	Online Form		118
Hall	Jackie		Morgantown	WV	Online Form		119
Hall	Jodye			WV	Online Form		120

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Harrison	Kait			OR	Online Form		121
Harshbarger	Dave	City resident	Morgantown	WV	Online Form		122
Hart	Mary		Morgantown	WV	Online Form		123
Hart	Mary Lee		Morgantown	WV	Online Form		124
Hart	Sherry		Morgantown	WV	Online Form		125
Hastings	Jen			WV	Online Form		126
Hastings	Jennifer	Joy and Hemp Universal; Conscious Harvest Cooperative		WV	Online Form		127
Hastings	Marilyn	Guided SVC LLC	Morgantown	WV	Online Form		128
Hastings	Mary		Morgantown	WV	Online Form		129
Hastings	Mary	Joy and Happiness Universal	Morgantown	WV	Online Form		130
Hastings	Ted	Conscious Harvest Cooperative	Morgantown	WV	Online Form		131
Hastings	Ted	Concerned citizen	Morgantown	WV	Online Form		132
Hepkins	Ruthanne			WV	Online Form		133
Herget	Deborah		Morgantown	WV	Online Form		134
Herget	Deborah		Morgantown	WV	Online Form		135
Herman	Carissa	Conscious Harvest	Morgantown	WV	Online Form		136
Hetzel	Erica		Morgantown	WV	Online Form		137
Hilling	Lisa		Morgantown	WV	Online Form		138
Hoch	Allyson		Morgantown	WV	Online Form		139
Hoover	Gretchen		Arthurdale	WV	Online Form		140
Houck	Samuel	None	Morgantown	WV	Online Form		141

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Howell	Verna		Morgantown	WV	Online Form		142
Hughes	Marcia			WV	Online Form		143
Jackson	Sharon			WV	Online Form		144
Jefferys	Becky		Morgantown	WV	Online Form		145
Jenkins	Connie	State worker	Morgantown	WV	Online Form		146
Johnson	Tammi		Kingwood	WV	Online Form		147
Jones	Ceranda		Morgantown	WV	Online Form		148
Judy	Krystal			WV	Online Form		149
Kalwar	Tarik	Community member	Morgantown	WV	Online Form		150
Kelley	Melissa		Kingwood	WV	Online Form		151
Kessel	Gene		Morgantown	WV	Online Form		152
Kessler	Bert			WV	Online Form		153
Korf	Mary		Fairmont	WV	Online Form		154
Kulathumani	Gayathri			WV	Online Form		155
Kummer	Sarah			WV	Online Form		156
Kyle	Jonathan			WV	Online Form		157
Kyle	Josh			WV	Online Form		158
Kyle	Mark			WV	Online Form		159
Kyle	Patrick			WV	Online Form		160
Kyle	Patrick			WV	Online Form		161
Kyle	Patrick			WV	Online Form		162
Kyle	Tipper			WV	Online Form		163
Kyle	Hannah		Morgantown	WV	Online Form		164
Lambert	Chris		Morgantown	WV	Online Form		165
Lambert	Madison		Morgantown	WV	Online Form		166
Lambert	Sarah			WV	Online Form		167

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Lancaster	Brandy		Moundsville	WV	Online Form		168
Lantz	Gavin		Morgantown	WV	Online Form		169
Linton	Sara		Morgantown	WV	Online Form		170
Linton	Sara			WV	Online Form		171
Lipscomb	Tracy		Morgantown	WV	Online Form		172
Lohnes	Joshua	West Virginia University - Food Justice Lab	Morgantown	WV	Online Form		173
Manypenny	Mike	Public	Grafton	WV	Online Form		174
Marie	Ivy			WV	Online Form		175
Marple	Amanda	Conscious Harvest Cooperative	Morgantown	WV	Online Form		176
Marsh	Brandon		Morgantown	WV	Online Form		177
Masters	Kelsey		Jeffersonvilld	IN	Online Form		178
Maupin	Maya		Louisville	KY	Online Form		179
Mcalpine	Christina		Morgantown	WV	Online Form		180
Mccolloch	Gayle	Private Citizen	Morgantown	WV	Online Form		181
Mcdaniel	Lew		Morgantown	WV	Online Form		182
Mckinney	Gary		Morgantown	WV	Online Form		183
Mcnemar	Andrea		Morgantown	WV	Online Form		184
Mcnemar	Chris		Morgantown	WV	Online Form		185
Melgar	Silvano			WV	Online Form		186
Michael	David		Reedsville	WV	Online Form		187
Molisee	Eleanor		Morgantown	WV	Online Form		188
Mollohan	Mellissa			WV	Online Form		189
Morton	Dennis			WV	Online Form		190
Morton	Susan			WV	Online Form		191

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Mucino	Veronique		Morgantown	WV	Online Form		192
Mullens	Amanda		Morgantown	WV	Online Form		193
Mullens	Amanda		Morgantown	WV	Online Form		194
Murray	Cheryl		Morgantown	WV	Online Form		195
Nestor	Amanda		Morgantown	WV	Online Form		196
Oztan	Mehmet	Conscious Harvest Cooperative		WV	Online Form		197
Patrick	Jonathan			WV	Online Form		198
Pavlovic	Anastasia	Yara North America	Morgantown	WV	Online Form		199
Perkins	Brittany			WV	Online Form		200
Perkins	Kelly			WV	Online Form		201
Pratt-Lilly	Linda		Independence	WV	Online Form		202
Queen	Randy		Morgantown	WV	Online Form		203
Queen	Randy		Morgantown	WV	Online Form		204
Ramsey	Cindy		Belington	WV	Online Form		205
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Riley	Patrick		Morgantown	WV	Online Form		208
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Savage	Kelli			WV	Online Form		211
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Sedlock	Steve	Local resident	Morgantown	WV	Online Form		213
Shaver	Chelsea			WV	Online Form		214
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Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Simons	Christopher		Morgantown	WV	Online Form		217
Snider	Melissa		Morgantown	WV	Online Form		218
Snyder	Jonathan		Morgantown	WV	Online Form		219
Snyder	Kaitlyn			WV	Online Form		220
Spenler	Herbert M.	Resident Lower Aarons Creek Road	Morgantown	WV	Online Form		221
Stanley	Phil			WV	Online Form		222
Stemple	Amanda			WV	Online Form		223
Stephens	Kory		Morgantown	WV	Online Form		224
Stickler	Heather		Morgantown	WV	Online Form		225
Stockdale	Alexandra	City of Morgantown	Morgantown	WV	Online Form		226
Stotch	Leopold			WV	Online Form		227
Strough	Jonell			WV	Online Form		228
Summers	Deborah		Morgantown	WV	Online Form		229
Summers	Karen		Morgantown	WV	Online Form		230
Summers	Morgan		Morgantown	WV	Online Form		231
Sussman	Caitlin	Mulan Puskar Health Right	Morgantown	WV	Online Form		232
Swiger	Joshua		Morgantown	WV	Online Form		233
Sylvester	Andrew	Conscious Harvest Cooperative	Morgantown	WV	Online Form		234
Talerico	Thomas		Morgantown	WV	Online Form		235
Tate	Christy		Morgantown	WV	Online Form		236
Thoma	Ehren			WV	Online Form		237
Thompson	Lucas			WV	Online Form		238
Tidwell	Jessica			WV	Online Form		239

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Todesko	Joe		Kingwood	WV	Online Form		240
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Tsai	Ben		Fairfax	VA	Online Form		242
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Turner	Jennifer		Morgantown	WV	Online Form		244
Uzstop	Will			WV	Online Form		245
Vasquez	Victoria		Morgantown	WV	Online Form		246
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Zou	Xiao	Great Wall Chinese Restaurant	Morgantown	WV	Online Form		261
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Gerasimovich	Kelli		Morgantown	WV	Email	10/10/2019	264

Table 2: Comments and Concerns Submitted

Comment Number	Comments
1	We support the round about project. We hope you take into consideration the amount of traffic that will run on the roads and make the round about large enough.
2	While closures on Kingwood Pike procede work needs to be done on Aaron's Creek and Lower Aaron's Creek road to allow for increased traffic. Also, Luckey Lane needs inprovement to allow for the increased detour traffic. Shoulders need to be widen, surface needs paved so two cars can travel in both directions.
3	There appears to be no specific consideration given for bicycle traffic other than to coexist with automobile and truck traffic. While this may be possible for the most avid of cyclists, I feel it fails to provide service to a critical component of the future transportation mixture - cycling. I'd like to see a targeted focus on making meaningful investment in cycling infrastructure to encourage safe and effective travel for all levels of cyclist to get the places they need and want to go. If we don't start now and every time we make significant [unclear] in transportation it will never happen. We need to build things so people can use them.
4	Who is in charge of the new sidewalk, city cannot maintain what it has now? Luckey Lane needs widened to be used as a detour. Do we really need a roundabout at the pike, why not a left turn lane? Please make the study available to the public. Please leave the community garden along
5	As the owner of the Atomic Grill restaurant and the owner of the building at 595 Greenbag Road, I believe the newly proposed roundabout will enhance and improve traffic flow and commerce for the Greenbag road and surrounding communities.
6	Sidewalk continuation on Dorsey after the Atomic Grill to Luckey Lane, sidewalk on Luckey Lane as a safe route to school. Minimize land take at the Conscious Harvest garden (diagonal from Atomic Grill)
7	Is going to be a major problem (to go N to Morgantown I'll have to drive S). I feel it is a waste of $10 mil. Will be tricky for 18 wheel trucks and all the school buses. Would prefer a plan B. Give us the better road, the wider lanes, the turning lanes, wider berms and leave the roundabout out of the picture. Any widening of Luckey Lane will make houses useless and maybe the church also.
8	Luckey Lane and Dollar General intersections do not appear to show large truck traffic impacts. 857 near Mountainview Elem is not currently a 15 mph school zone, should this be examined? Large truck traffic in the morning hours plus school traffic may cause congestion at traffic circles
9	A leading green arrow would be a cheaper and still functional alternative to allow turning traffic in each direction to move more quickly. Also a turning lane in each direction. I don't agree with a roundabout at this location. If this is the plan though the planned route for Kingwood Pike travelers must be repaired/repaved (Aaron's Creek is an absolute nightmare - pot holes, narrow at points). This must be corrected before detouring traffic this way.

Comment Number	Comments
10	I have recently attended the public informational workshop for this project, which includes widening Greenbag Road, Lucky Avenue and Dorsey Avenue. I have great concerns that were not clearly answered at the meeting that was held. It is possible that this project will affect me greatly, and that is in addition to the huge inconvenience that will occur as a result of this project. My property is located directly across from Lucky Lane. This is the intersection of the planned detour once Dorsey Ave is closed. Also, as the widening of Dorsey Avenue takes place between the existing roadway and my property it could cause my home to be uninhabitable. This project could cause my property value to plummet should my property be encroached upon even in the most minimal way. As I see it, damages could include the removal of my natural barrier of shrubbery that exists between the roadway and my house. It could also create havoc in the short-term with the detour while entering and exiting my driveway. However, in the long term it could very well make it impossible. As you will notice in the picture, to use and safely exit my garage and enter the roadway, I need to have access to the full length of my driveway as it is necessary to stop, shut the garage door, and carefully enter onto Dorsey Avenue. I was unable to receive information the evening of the meeting stating exactly the plan and intention for the Lucky Lane, Dorsey Avenue and my property. I would like to have this information as I am directly and prominently effected by this road construction project. This note isn't only to express my comments, but to ask and receive additional information that is pertinent and necessary before this project proceeds and devalues my property and home. I will include in a mailed copy pictures to help you see the significance of this project on my property, as well as see my home in conjunction to Lucky Lane (directly across from it) and Dorsey Avenue (running parallel). Or, please send me an email address and I will send pictures directly.
11	Published letter to the editor, Dominion Post, *summarized* - waste of money, problematic during construction, not fix problems. Roundabouts are unpopular. Need alternatives. New berms will permit 18 wheelers to navigate through roundabouts. Propose widening Greenbag at 90-degree turns and snake turn, berm both sides for entire length, turn lanes at intersection with Dorsey/Kingwood, dedicated traffic lights for schools, sidewalk from Mississippi Street to the west. Repair roads with remaining money.

Comment Number	Comments
12	My first reaction when I read the headlines in our local paper "Roundabout for Greenbag Road" I said "how dumb can you get" and after reading the article I have not changed my mind - anyone that would even consider putting in a roundabout, a sidewalk - a bike lane or any other things for that area has surely never even come to see the conditions we travel in - I am sure they have never been up the Kingwood Pike where we practically have to come to a stop before falling into a pot hole or try to get over a dip in the road that would cause your muffler to come off your car - if you don't believe me - come and see for yourself - I have lived here 89 ears and this is one of the dumbest ideas I have ever heard of - I'll be in heaven and I won't have to put up with such stupidity - but I feel for others who will lose their property and for my children - my grandchildren - my great grandchildren - at the least they could do would be to think about the churches on the Greenbag Road that have finally been able to have Christian schools for children to come to and this in no way would help them but probably destroy them - for that matter it will not help anyone - May God help us all and give us wisdom to make right decisions - not just look at a map and decide.
13	Our roads need improvement. Roundabouts are dangerous. We don't need roundabouts. Waste of money, pave our roads, too close to schools
14	I am writing this letter because my husband and I whole heartedly agree with the gentleman that wrote the attached article in the Dominion Post. It is totally crazy to put roundabouts in and not a turn lane. Truthfully at the Kingwood Pike it worked better when there was a 4-way stop. We are against the roundabouts and hope you will rethink your decision.
15	The construction of a large roundabout at the intersection of Greenbag Road and Kingwood Pike would require the destruction of an important productive greenspace on land belonging to the Hastings family. Among its other ongoing contributions to the local community, this site hosts the Conscious Harvest Cooperative community garden, which offers a place for landless citizens to produce their own food. For this reason along, the State's environmental assessment erred severely with its "Categorical Exclusion" determination. The Hasting family has been very generous to offer this land for use by members of the Morgantown community and it would be reprehensible for the State to seize it for the purposes of unnecessary road expansions. Based on the information included in the document that was presented in conjunction with the public informational workshop of April 16, 2019, WVDOT does not have a reasonable justification for this project. The primary goal is obviously to redirect heavy truck traffic through the proposed project area, and this would hardly serve the interests of the local residents who would be most directly affected on a daily basis. More broadly, I submit my opinion that in view of WVDOTs continual widespread neglect of its existing infrastructure in the Morgantown area, the State should not engage in any new road construction projects in the region until it has devised and implemented an effective maintenance program for the existing road system. I urge you either to completely cancel the proposed Greenbag Road Improvement Project, or at a bare minimum, to substantially revise its entire scope so as to mitigate its otherwise devastating impact on the surrounding community.

Comment Number	Comments
16	I'm landowner of what is currently known as Dorsey Plantation Farms and Homes, which your project 80% of our lands. DOH was sold a right of way thru our farm to join up route 857 - Greenbag Road in 1963. As well as Route 81 Old Kingwood Pike. I "texted" a Stahl Sheaffer employee 11 Feb 2019 about some concerns I had shared with him and another engineer of Stahl 3 weeks earlier when they came to my home for signature for archaeological excavation. 1. spring 2. drainage 3. right of way 4. slip. 11 Mar 2019 yet another Stahl engineer came to my home for another signature. I gave him a copy of my text to Andrew at Stahl and ask him to respond, which there has been none. After decades of no help, I placed a box on Rt 81 and piped your run off, that cost me several harvests out of my pocket to the tune of $7000. Director this is a recent example of lack of communication from several levels of government and agencies or contractors. I've attempted to reach our over the years. Which by your title "Director of". Once again your comment period does not allow for open communications. I just left DEP in Pleasant Valley. Arron said there understaffed. He did acknowledge it's not smart to build a highway on a spring! It being Friday I was told they be in touch. Sound familiar?
17	Apolla Drive off Dorsey - very near your work area - Luckey Lane - Mt. View School/access - Apollo Drive (3rd right off Dorsey). Apollo is a private road. Access to it about 80 feet - informed by city is DOH responsibility. It is impassible with 15 (some very deep) potholes. While all the equiment to resurface it are so close - please do so. Stage 4 temporary traffic signal just past Richard - in order to avoid light toward Don Knotts Blvd/Luckey Lane detour, lots of traffic will turn right onto Richard past Mt. View Elem onto Apolla Drive, a private road. The traffic will turn left onto Apolla and continue out to Dorsey. Apolla/Richard can't be blocked off. Brookhaven Fire Dept needs access to 200 block of Apolla Drive at this point. Suggestion - large sign at intersection of Richard and Greenbag Road "No Thru Traffic". Large sign at intersection of Richard and Apolla "Private Road - No Thru Traffic"
18	I strongly oppose your plan for the Greenbag - Old Kingwood Pike. The 4-way stop worked fine and I'm sure the present light could be programmed to allow the Greenbag Road traffic to flow thru. A turn lane would work, I'm sure all the Lumber Co on the Old Kingwood Pike would not favor this change. Very few accident here compared to Greenbag and University Ave. The need is greater at 705 and Stewart Street on 705 and Van Voohees. The enclosed letter to the editor states it better than I.
19	Mailed copy of email from Mary Smith (WVDOH D2 Realty agent) to Doug Mooney on 11/9/2016 regarding the right of way along Kingwood Pike (CR 81). Highlighted sections state CR 81 has a 60 foot r/w and 857 was part of old 64. Written notes indicate 857 was not part of old 64 but sold to state in 1963 and CR81 r/w was not 60 feet wide in 1967
20	Safety is #1. This plan proposes 2 roundabouts in less than 0.04 of a mile. There are no sidewalks near either roundabout. How are pedestrians going to be safe crossing the road? As mortician for over 30 years I want you to know its easy to die. I was told national stats say are safer. I challenge you to examine # accidents on Mileground roundabout (3 years). 10 fold the previous decade.

Comment Number	Comments
21	Letter from Bowles Rice Attorneys at law *summarized* - project will have a significant impact to the land use and natural resources of the Hastings Property. Does not support current project. Believe Categorical Exclusion is improper due to significant effect on human environment. Hastings Property is family owned and operated farm of 117 years. Community green space. Home to Conscious Harvest Cooperative. Has established garlic bed, home to wild mint and wild mushrooms, allow foraging by public, utilized by WV based industrial hemp research program. Request EIS or EA.
22	I've lived in this area for 20 years. And think that a roundabout at the intersection of the Kingwood Pike and Greenbag Road is a safety issue. There is a natural slip being held up by a wall that would be used. Which doesn't make sense. And how are people to get across this roundabout to use the proposed sidewalk! A turning lane or return to a 4 way stop sign is a safer option.
23	I feel threatened by our government. To destory a farm for a roundabout when a simple turning lane and light would do. I feel my property is not safe. It can be taken at anytime and what's just as scary? The peoples tax dollars have to be granted to us to use for unnecessary projects like these. I'm just a simple guy. if I don't see the big picture can you please send a detailed explanation in writing on what I'm not seeing. I'll break out the law dictionary.
24	I am a resident of Morgantown WV and a WV taxpayer, and I am writing to express my strong opposition to the proposed Greenbag Road Improvement Project. The new project plan by the WVDOT proposes a largge roundabout at the Kingwood Pike and Greenbag Road intersection. Currenly the State's plan claims there will be no significant Human or Environmental Impact to the project. I believe that these claims have been made in error. The project places an area of land which is currently home to the Conscious Harvest Cooperative, a community garden space wihchis much beloved by the Morgantown Community. This organization works to reduce food insecurity in WV and has been providing other charitable services to improve the lives of locals. Additionally, as a current PhD candidate at WVU, I have been fortunate enough to rent one of the Cooperative's plots of land in this area. I have greatly enjoyed my time in the growing vegetables and flowers and speding time in the wooded area next to the garden. I have always been happy that I could help support the Coop's mission, and would be deeply saddened to have my time at the garden and work with this wonderful community come to an end. I feel that the roundabout would severely impact this beautiful agricultural and natural area and stunt the good work being done by the Conscious Harvest Cooperative. I urge you to cancel the proposed Greenbag Road Improvement or at least seek other options that will mitigate its devastating impact on our community.

Comment Number	Comments
25	First and foremost, I am in disagreement that these roundabouts are necessary or the best design for Greenbag. I believe center turn lanes would be a more cost effective solution. The design does not provide a center lane near Mt. View Elem. Which is a dangerous and somewhat hidden turn at the entrance. Mississippi, Dorsey, and the Pike don't add so much burden to warrant a roundabout. Secondly I am concerned about any disturbance of earth on or adjacent to the wall on Greenbag. When Greenbag was constructed they ruined our family farms structures and livelihood. Apparently this was not a lesson learned as the design calls for more disturbance. The family home was spared with is where I and my family now live. I am greatly concerned that disturbance could claim our historic 100 yr home. I do not feel that the time DOH provided was sufficient to contemplate and address all concerns. I would kindly ask for answers/remedies to the following points. Will a pre-construction survey be done, including testing of my well, sound and light levels (currently)? I am concerned about the increased traffic count so close to my home, and any light apparatus. I try to keep my property attractive, good curb appeal. I also have tried to create a tree buffer from the intersection. Will the state do its part to maintain mature trees nearby and replace what they take? Can a wall that is not green steel and smooth face concrete be achieved so to not diminish the appeal and value of my property? I am against having a sidewalk on the southeast and southwest corners of the roundabout. There is zero pedestrian traffic on the Kingwood Pike, with no businesses and only a handful of residences all the way to I-68 overpass. I believe that the improved pedestrian access adjacent to my property will encourage trespassing or other degenerative activity. Who's responsible for maintaining the sidewalk and snow removal? Will the state replace my billboard and compensate for lost revenue? Will my driveway extension be concrete as the rest of my existing driveway? I do not want the added maintenance of sealing asphalt. My driveway is also the main access for our farm, and needs better radius than what's proposed. We bring tractor trailers and large farm equipment through regularly. To have a roundabout less than 100 feet from my house is upsetting. To bring so much more traffic so close to my home will be disturbing. Though the actual right of way will only take a small portion of my property, I consider the roundabout to be an undesirable, unattractive, and devaluing object. I consider this design damages the resale value of my home and property. I would like to know if the state would qualify my remaining property as damaged to the residue. Overall I feel this is a poor design, and other alternatives should have been provided to the public, and for comment. I voted in favor of the road bonds, and I am for improvement on the Greenbag corridor but not this. I would appreciate a prompt response or dialogue to my questions and concerns, so I may know what to anticipate regarding my home and property in the coming months.
26	I am writing about the proposed rouandabout on the Greenbag Road. The property that the roundabout will be built on belongs to Dewey Samuel Hastings. He's against it and so am I.
27	Advertisement - Do you think 2 roundabouts within 4/10 of a mile is smart or safe? Say No to the Roundabouts
28	Advertisement - We need your help! If you have a memorable experience of Dorsey Farm, Bluegrass Dairy, Hastings Stables, High Moon Stables and see value in local farm land, call today, only 2 days left, say no to the Kingwood Pike Roundabout
29	Advertisement - If your family has enjoyed local produce from a community garden and you see value in farm land, say no to the Kingwood Pike roundabout

Comment Number	Comments
30	I am a Morgantown resident and I wanted to say I am strongly in favor of all the roundabouts possibilities I have heard mentioned. Where space permits and pedestrian traffic is moderate, they are effective for both traffic throughput and latency. I also think they would help at Campus Drive and Beechurst/US 19 and at the Southbound exit of I-79 to Chaplin Rd.
31	I have heard that Morgantown is considering putting in large round about at the Kingwood Pike Greenbag intersection There is a community garden there, that many people use and would miss if you put in the roundabout. There are other solutions that could be used such as building a turning lane, a turn signal, expanding the road, or adding turning signs. It would be very upsetting to destroy something that brings us together as a community when other options are available. I personally have heard people in the South Park neighborhood that are upset about the plans, and know local farmers will be upset by it.
32	You have the historical incorrect information on right of ways. 1961-857-sold to you. I have the documents. Rt 81 Kingwood Pike is not 60 feet. I wrote Stahl 11 Feb 2019 about this, no answer
33	Extensive letter *summarized* here - request alternatives, current project will waste money, tie up traffic during construction and not alleviate traffic congestion. Dislike roundabouts. Additional travel time during construction will cost money. Lower Aaron's Creek road unsuitable for detour. Construction to change the 2 90-degree turns and S turn will be costly and cumbersome. Roundabouts will not be well received. Businesses on Kingwood Pike will be impacted during construction. Logging businesses on Pike may not survive the closure during construction. Problems associated with berms and sidewalks. What studies were done to assess the need, how many, by whom? Proposed alternative plan: turning lanes on Greenbag; re-pave, widen, and berm the length of Greenbag Road; sidewalk from Miss. Street to Mountaineer Mall; school stop lights for South Middle and Mountaineer Elem (time controlled); use remaining funds for roadway improvements. Alternative plan gets bypass, less construction disruption, good PR for State. Current proposal creates hardships on citizens, nightmares for business, waste of road money with little gained and fails to correct major road issue.
34	Put a turning lane in. 705 does not work. No roundabout.
35	Roundabout is not necessary. What is necessary is a left hand turn lane and a left turn green arrow signal. A right turn lane with signal would also be good there. This would be placed at intersection right before the Atomic Grill as you drive away from the Mountaineer Mall.
36	Please do not kill the Pike four-way! Traffic is bad everywhere, this is not the worst. My family, friends, neighbors, and loved ones have stemmed from the Kingwood Pike for generations. Every local loyal person I know is against it! My personal advice is to do away with the light. It worked beautifully when it was simply a four way stop. I've lived here all my life. Not to mention the rape of people's personal land, history, and heritage...the environment, ecosystem and natural beauty of our little left green areas. I beg you as a permanent local citizen to reconsider your mistake!
37	My children love this place! Please don't take this farm away from us! We don't want a roundabout at this farm! Put a roundabout in front of the Coliseum instead, or at Harman Run Road in front of the airport. That is where it is really congested and needed. The community doesn't want a roundabout at Kingwood Pike, the community wants a shared space, a place for the children to learn.

Comment Number	Comments
38	The Hasting's Farm serves as an educational tool to all those who venture and participate. You should see how much the children love to visit and learn. You should see how volunteers from our community come together for a common goal. You should see how the Hasting's share with the neighbors in this community. We don't need a roundabout at Kingwood Pike and Greenbag Road. Why not invest all that Federal money into clean water technology, clean food technology, why not build a new treatment center for people in our community to get treatment for addiction? Why not fix the roads we already have? I'm saying no to the roundabout!
39	The land you're considering using as a roundabout is land that is essential to improving lives in our community. The Conscious Harvest Cooperative provides low income families with access to local produce and sustains food security for these families who may not have means to fee their children healthy foods. West Virginia has a serious problem concerning food security and it is well known that we are one of the unhealthiest states in our nation. What kind of message are you sending if you choose to deprive our community of means to a healthier way of living?
40	I grow vegetables over there. I don't want that farm turn to roundabout. The roundabout is no help for the traffic's problem
41	Proposed plans for a roundabout at this intersection will have significant lasting impacts on land use for the community. As a resident and student in Physical Therapy, West Virginia's health status is desperate for community-based initiatives and partnerships with agricultural resources. The family owned farm of 117 years helps to support the community with access to farmland for research, education, and local produce. Promote health and wellness opportunities and consider alternatives for construction and city planning
42	Constructing a large roundabout at this intersection is unnecessary and will cause harm to the community. I urge you to reconsider the effects this proposed plan will have on the farmland, home to Conscious Harvest Cooperative, a community green space and WVU student garden, all that provide local access to produce. I firmly support a solution to the truck traffic through Morgantown via other alternatives - a turning signal or lane, signs or a road expansion. Protect farms in WV! Commuting through this intersection at the peak traffic times is not that congested - choose health for WV!
43	sent copy of Tom Talerico April 29 Letter to the Editor, Dominion post
44	I do not support a roundabout at the location. This would take away from land and not really fix the problem. We are a small town structure with a city population - there will be traffic. There has been no sign (ex. - Mileground) that a roundabout is affective enough to help with traffic. This will only take away and add more problems. That is my opinion
45	I personally am fond of Morgantown destroying all our greenspace! They cut down all our mountains already! Stop the roundabout project! Stop destroying our children's grass and trees! Leave something for the children! The mall is dead! Walmart is gone too! Leave this land alone!
46	Please consider the effects that a roundabout will cause for the farmland in this area. As a Veteran, I can also say that as roundabout work in places such as England, most Americas do not know how to use them properly and cause more traffic and collisions. Please look at alternate solutions.

Comment Number	Comments
47	This is about a new project plan by the West Virginia Dept of Transportation to put a large roundabout at the Kingwood Pike and Greenbag Road intersection. These plans would significantly impact our community due to the total acreage they wish to acquire/annex via eminent domain. The State's Environmental Assessment of the project rendered it a Categorical Exclusion (CE) for expedited approvals without traditional public comment because the project claims "no significant human or environmental impact." This exclusion is unacceptable. We request a full environmental impact assessment and reassessment of the Categorical Exclusion. The project WILL affect land use for the area, have a significant impact on natural, historic, economic, environmental, and agricultural resources, and significantly impact air, noise, and water quality. This land is a: 1. community green space. 2. family owned and operated farm of 117 years. 3. home to Conscious Harvest Cooperative, an established non-profit organization, 501(c)3, working on alternative food sourcing strategies to combat food insecurity and increase food access in Morgantown, WV. 4. recreation space, including a wild mint and wild mushroom foraging area. 5. participating WV-permitted industrial help research program. 6. established garlic bed that supplying to local families and restaurants. 7. WVU agronomy student research and project growing area. 8. educational site for K-12 students, undergraduate and graduate students for food systems, horticulture, human nutrition and foods. 9. pollinator gardens that provide food and habitat. 10. gardening space for individuals to grow their own food. The further impact on agriculture, education, food access, and the environment can not be under-stated. We are open to alternatives that include turning lanes as apposed to leveling our farm and dreams to the insert roundabout at this intersection.
48	This new project puts at risk and jeopardizes the unique ecosystem created here for both wildlife and human life. The construction of this roundabout is unethical and immoral as it robs from the community in more ways than one.
49	We do NOT need a roundabout.....we NEED TURNING LANES!!
50	It would be more beneficial to make a turning lane instead of a roundabout
51	The public is against this roundabout. There are so many other options - pick one that doesn't destroy everyone's lives, time, money, homesteads, mother nature, and our hard earned tax money. Ridiculous
52	We are against this roundabout! If traffic is so bad, add a turning lane! This is way too big of a project, too much money, too much construction- why would you propose such a massive project first? why not add a turning lane to that light we put in so maybe it will actually work. This is ridiculous! Huge impact on the environment and on the people: Categorical Exclusion should be revoked! How dare you steal peoples' land right underneath them! And ruin the Pike while you're at it! shame on you
53	I think the roundabout is a waste of time. What money you all spend on it you can fix the roads and drainage problems here on the pike
54	Can we please stop with the roundabouts? They do not help. They are causing other areas to become congested with people attempting to avoid them. These aren’t even decent ones. Visit Carmel, Indiana or Hilton Head Island, SC. Ten times easier to navigate and a better layout. An absolute NO from me for more roundabouts.

Comment Number	Comments
55	Why waste all that time and money for these projects. When all that is needed are turning lanes and arrow lights. Use the money to fix roads that are unbearable instead of creating new ones.
56	I am writing as a former resident of Morgantown. I am concerned about the impact that the roundabout will have on the heritage farm and community garden in that area. This is an important cultural and social resource in Morgantown. Please consider its future in your plans.
57	No more round abouts! They reward aggressive driving.
58	It has been brought to my attention that there are plans for a roundabout to be constructed at the intersections of Greenbag Road and Kingwood Pike in Monongalia County. Please know that I am opposed to any such plans that would include a roundabout in this location. The roundabout will not adequately address the truck traffic which descends the Kingwood Pike on a daily basis. Additionally, the roundabout severely limits the use of the community garden located at this same intersection. I might add, this is the only community garden meeting the needs of our growing region.
59	Roundabout is not needed, money would be better spent repairing existing roadways. Example Kingwood Pike lane slippage.
60	I have serious about money being wasted to inter-grate a traffic circle into the Kingwood Pike/Dorsey Ave intersection. What a total waste of revenue in WV. My husband and I drove those roads daily and there is ONE HOUR daily, from 5:00-6:00 that this road is even remotely congested. That is the time that Mylan Pharmaceuticals Office in the Mountaineer Mall closes. That isn't even a permanent office. Mylan could dissolve in Morgantown one day. I feel that this project is unnecessary and will cause more traffic problems than currently exists. Please hear out the many who travel these routes and reconsider.
61	A roundabout at the Kingwood Pike/Dorsey ave. intersection isn't necessary. A simple turn light on all sides would solve any traffic flow issues. The time and resources used to make a roundabout would be better spent on fixing the severely deteriorating roads.
62	Widen the road and put in turn lanes and turn lights. A round about will not help. Do the same thing in Sabraton at the green bag road. Use the money effectively.
63	We do not need a round about just will cause more congestion and wrecks!! What we need is turning lanes and signals!! I am absolutely against roundabouts they don't work!!! Look at the one coming off 705 it's is congested at the rush hour times and takes just as long to get through!!! Not going to help the traffic at the pike but turning lights and turning signal lights would!
64	I respectfully ask that round abouts not be the solution to the Greenbag Road project. Adding additional lanes, turn lanes, should solve and traffic issues in this area. I live on the Kingwood Pike and have my whole life. We are fortunate to have this beautiful area so close to the city. I know we can do better than ugly round abouts and what is up with sidewalks there?? I travel that road everyday, all times of day. There is VERY little pedestrian traffic on Greenbag. Let's reserve the beauty and save some money and just add turn lanes. We don't need to make a big showing, just fix the problem. Thank you for your consideration

Comment Number	Comments
65	I don't think the double roundabouts will work. The one on the Mileground doesn't work during rush hour especially if you are coming from town going toward the hospital. No one will let you out and if you find a break in the traffic, you are almost taking your life in your hands. Trucks also have trouble driving in them too. They almost need both lanes in the circle. I think it would be better to widen the road in the area of Kingwood Pike and add turning lanes. In the area of Mississippi Street put a traffic light that is only triggered by those coming out of the school area. I hope this construction doesn't kill the few businesses that are on the Greenbag Road.
66	I hate roundabouts
67	We do NOT need a Round about at the intersection of Kingwood Pike and Dorsey Avenue
68	I think the roundabouts and side walks are a great idea. My church and kids school are on Greenbag road. It will be so nice if the traffic flows better. Round abouts are really the best. Also, my high schooler sometimes gets off the bus and walks Greenbag road to his dad's place of employment. It worries me with the traffic. I'm so happy about the sidewalks going in.
69	This is an atrocity. I have spent a lot of time at this beautiful Morgantown oasis. This is one of the last remaining farms so close to downtown. The family that occupies this farm are also some of the most genuine, open and welcoming people I've ever met and are always willing to share their space and abundance with others. I believe this is also the location of the ONLY community farm in Morgantown. This round a bout will not only affect the community but also the environmental implications are astound. This will negatively affect the people of Morgantown as well as plants and animals who occupy this land currently. This farm has big plans for the future, are planning to grow medicine as well as nourish folks with community and food the community garden grows. DONT ALLOW THIS ROUNDABOUT TO DESTROY THIS BEAUTIFUL FARM AND COMMUNITY GARDEN.
70	I use the Greenbag Rd on an almost daily basis and I think the plans for Dorsey Ave and Mississippi St are unnecessarily extravagant. All you need to do is widen the 2 intersections, providing a turning lane heading northeast on GBR onto Mississippi St and widening the Dorsey Ave intersection by adding turning lanes. I am also concerned about how The Mississippi St work will affect Cobun Creek nearby, and the active business at Dorsey Ave. And while I assume the DOH (such an unfortunate abbreviation) can handle more than one project at the same time, I fervently believe that it should focus on the Route 7/Greenbag Road intersection first. The situation there needs urgent attention. (Apologies for any typos..this tiny window for writing doesn't allow any maneuverability)
71	This is beyond unnecessary, a simple solution is widening and putting a turn signal at the kingwood pike traffic light. Whomever is making this decision does not live anywhere near this intersection and has no understanding of the area.
72	We do not need another round a bout on greenbag road.
73	This is spending money which isn't necessary. Travel this every day. Just put some green arrow turn signals in traffic light. Lain brain idea for a roundabout much less for two.

Comment Number	Comments
74	1. This is a community green space 2. It's a family owned and operated farm of 117 years. 3. Home to Conscious Harvest Cooperative, an established nonprofit working on alternative food sourcing strategies to combat food insecurity and increase food access in Morgantown, WV. 4. It's a recreation space, including a wild mint and wild mushroom foraging area 5.Participating WV-permitted industrial hemp research program. 6. It's an established garlic bed that supplies local families and restaurants. 7. It's WVU's Agronomy student growing garden.
75	Has the state looked at all options? There are so many other roads that need fixed badly that the area doesn't seem like a top priority and that's good land to use.
76	There is no need for the round about at the intersection at the bottom of the kingwood pike. It is only gonna make it worse down there. The lights are bad enough. There is absolutely no need for it.
77	I oppose the roundabout, gardens are much more important for a community
78	I oppose the roundabout, gardens are much more important for a community
79	I would like to express my concerns regarding the proposed roundabout at the intersection of Greenbag Rd and Kingwood Pike/Dorsey Ave. I understand that this construction would absorb a significant portion of the agricultural land owned by the Hastings family. This land is flat and suitable for vegetable production or similar uses. Monongalia County has very little flat land suitable for agriculture that has not already been commercialized. Taking this agricultural land for a roundabout is very concerning. I have a BS in Horticulture from WVU and a MS in Plant Breeding from the University of Georgia. I currently work at Micro Genesis (a local greenhouse), and am also developing my own business model for an agricultural production company in Morgantown. The Hastings family has been kind enough to allow me to pursue agricultural endeavors on their farm. I planted tomatoes and herbs in 2018 on land that would be part of the proposed roundabout project. I sold produce I grew onsite directly to the public, on adjacent land owned by the Hastings family. This enabled me to test the market and refine my growing system. I hope to develop a local market on site in future years. I also performed plant breeding research in 2018 on this site. This research is part of a venture to develop a seed production business in the state. Having this incubation area is essential to obtain a business development loan in the future. I would support alternative plans that would involve a turning lane. However, a roundabout would take up too much of this valuable land that is supporting my efforts to develop an agricultural business in Morgantown. Please consider my request to stop this roundabout construction.

Comment Number	Comments
80	I am local to the South Park area, and do not support building a round about by the Dorsey Avenue/Kingwood Pike intersection. I have heard concerns from neighbors that it will take land from a local community garden, that means a lot to our residents. There are other options that can be used instead, like a turning lane. It clearly means a lot to our local farmers. This garden helps bring our community together, and to take the garden away from us to build a round about when other options are available would be very disappointing.
81	Please do not pave over the Conscious Harvest Cooperative. There must be another place for the roundabout!!
82	The community garden is a sacred place. It does wonders for the community and brings personal meaning and resources to the individuals and the community involved. The loss of sacred spaces like this and the impact they can have on peoples lives will never be offset by the potential value of traffic improvements. Please consider those who are emotionally invested and the loss to the community. Thanks!
83	A roundabout at this intersection would be an absolute nightmare. How about turning lanes and arrows.
84	The roundabout is a horrible idea. The Kingwood Pike is falling in and potholes everywhere. When it rains or snow the water runs on the road and makes it dangerous to drive on. It's in desperate need of repair. Please fix this Kingwood Pike and maybe put some tuning lanes instead of a roundabout.
85	Please don't have a roundabout built! This is a wonderful place which helps the community much more than a traffic circle could ever contribute to a community!
86	I think the round about is an amazing idea! Can't wait for it
87	This is a family farm, that has been operational for decades. This family has been a huge asset to the Morgantown community for decades. Morgantown does NOT need this "improvement", the need to focus on simple road maintenance before anything else.
88	PLEASE DO NOT FOLLOW THROUGH WITH THE ROUNDABOUT! Before following through with this project please be sure to take an assessment of all of the factors that will be impacted! Please consider the impact on food resources (that help feed my family), animal resources, economical resources, and community sharing resources. Instead of a round about, which only creates more traffic because no other expansions of the roads take place to accommodate the new feature (MILEGROUND) consider making turning lanes, turning signals at the light, or simply expanding the road to allow more thru traffic. All I ask is to please not take away our garden. People have been collaborating and sharing in this garden for years, to some like me this is the only space to garden, by taking this away you will be destroying our nutrition, community, and all of our hard work. Please consider all of the other factors before following through with you plan. Kind wishes!
89	Do not do this project! The traffic is bad because you put a stop light in with no turning lane. Add a turning lane!!! Common sense. No need to make a HUGE project out of this.. taking peoples land and spending tax payer money on a monstrosity. Wow. Don't do this.
90	DON'T touch this land
91	Please try a turning lane before there's no turning back. Roundabout here is a bad idea.

Comment Number	Comments
92	Please, please, please! Not every traffic woe in this town needs to have a roundabout! The average citizen hates them because they are confusing, so they tend to avoid those areas and find alternate routes that lots of times go through neighborhoods. Next, they take up a lot of space and are ugly and very expensive. How can this state justify the expense of these roundabouts when they can't even manage to take care of the roads we already have? There are other solutions to the light at this location. Even though traffic backs up after South Middle lets out, it moves through fast. You could just put in a turning lane, or even just prohibit left turns during peak times.
93	I think that putting is a waste of time and in some ways it is stealing. The ways that it is stealing is that the state would be taking land from people and businesses that the state does not own. Plus, not to mention that harm that It will do to the environment. The amount of money that it will take to make the changes to Greenbag road does not compare to just leaving thing alone. Changing the intersection at the Greenbag road and the Kingwood Pike road is both waste of time, money and energy. Most of the time it only take a few minute to wait to get through the intersection. Where as putting a round about at that intersection will take more time and cause more problems.
94	We don't need or want an expensive turnabout put at the end of Kingwood pike. They do nothing but back up traffic worse. The entire Kingwood Pike needs fixed, we have potholes that destroy vehicles and slides that needs fixed. NO TO THE H TURNABOUT. The one on the mileground was a total waste of money, traffic backs up worse than ever
95	Please do not build a round about on Greenbag Road. That would take up too much land for an unnecessary solution. There is a beautiful field that would be disturbed. A simple step would be to add arrow signals to make the left hand turn going towards Dorsey, that is all that is needed to solve the problem, not a huge project that would destroy businesses and farmland
96	Would you please consider putting an on and off ramp off 68 to access the Kingwood Pike. The lower end of the Kingwood Pike is a mess where the road has been slowly falling in. Seems like you get one area fixed and another area is starting to do it. This had been dis used as an option years ago. Thank you
97	I do not see any benefit in the proposed roundabout at the intersection of Kingwood Pike and Greenbag Road and would strongly oppose it.
98	I do not think a round about is the ideal choice. I think a turning lane and turning signal would work better!
99	I feel that the round about is not beneficial to our community or the traffic flow in the are. I think adding turning lanes on the Greenbag Road would help the flow of traffic tremendously. A lot of elderly people live on the Kingwood Pike that won't travel the mileground because of the round about. So adding one in a rural area would not be a good choice.
100	Please do not put in another roundabout. I vote for a turning lane only. The farm is a great asset to this town. If it is taken away, you take away from the locals. Please don't destroy a good thing.

Comment Number	Comments
101	I would also like to add one more comment. Instead of building more new roads, can we please just have all the roads in Morgantown fixed so they are smooth and not patched up? That would be better than wasting money on another headache. The drivers in Morgantown are not smart enough to figure out the roundabouts anyways, they still haven't figured it out on the Mileground Rd. It is always jammed up there.
102	This land is a valuable asset to the community and does not need to be turned into another road.
103	We opposed the round about and will like and alternative plan. The community deserve solution.
104	Roundabouts are extremely expensive and expansive. Surely there's a less costly traffic solution with lesser land impact. What other alternatives have been explored?
105	How about you use my tax dollars to fix the end of Kingwood Pike so I don't damage my car that I pay taxes on that I park in the driveway of my house that I am heavily taxed for owning.
106	Roundabouts are completely unnecessary on Greenbag Road. We are against this project because: the purpose of the project is to get the 'truck traffic out of downtown' as stated in the RFP. However, there is no law to make the truck drivers use the Greenbag Road nor any data to support that they ever will. Because: We do not want additional dump truck traffic in this area. They increase the risk to residents and school children. They have passed me on the 705 bypass going over 60 MPH! Because: the Kingwood Pike is A MESS and desperately needs quality road repair that the roundabout money could be used for. It is not property ditched; water runs across the road constantly which is especially hazardous when the temps drop; the lower end is caving in AGAIN and will probably collapse soon. Because: there is NO safe effective way to divert traffic off the Kingwood Pike to avoid the intersection during construction of a roundabout. A MAP may look good on paper but, go drive the road. It is not feasible to use the proposed routes without considerable outlays of time and money, which would be so much better spent on fixing the Kingwood Pike problems. Because: Kingwood Pike residents and surrounding areas will be physically cut off from our routine to work, to school, to gasoline, to the grocery store. It makes no sense to spend this much money, time and effort to address dump truck traffic when there are so many other road issues in our county. Please reconsider.
107	1. I believe the traffic circle at the Kingswood Pike intersection is a bad idea. I believe traffic lights will be a much better way to manage the bus traffic, the large dump truck traffic, the commuter traffic that occurs from the correction center and Mylan. 2. I live just off Lower Aaron's Creek road and it is in absolutely deplorable condition. It is riddled with huge potholes and washed out sections of roadway. The section of Aaron's Creek road that will be used is not much better. Many sections of these roads are way too narrow to handle two way traffic. Are there plans to improve these roads before you send all this additional traffic on these inadequate roadways? If not, I believe you are seeing yourselves up for huge problems and criticism! Thank you for allowing input from the public!

Comment Number	Comments
108	Please build a turn lane rather than a roundabout at the Kingwood Pike and Greenbag Road intersection. That is a beautiful area and there is a restaurant and a farm at that intersection along with trees and meadows that would be negatively impacted by building a roundabout. I drive thought that intersection several times a week and would hate to see the beauty and livelihood of the farm and restaurant harmed.
109	Save the community garden!!!!!
110	I oppose the roundabout bc gardens are more important for a community.
111	Would like to know where priorities are roundabout at the four way stop on Greenbag is a waste! There not that much traffic only at evening coming from the Morgantown and down Grafton rd (119) need one there! The Kingwood Pike is following in again and bad holes that have to take chances on dodging or Tear up your car or cause a bad wreck will not have way out to Greenbag road if not addressed soon!!!
112	A roundabout on Greenbag Road is definitely not needed. It would be a total waste of taxpayers money. All that is needed is a left turn arrow!
113	I think this is a complete waste of our state money when honestly the roads are HORRIBLE. And being diverted down to lower Aarons Creek to a more deplorable road is completely ridiculous. If traffic is the issue, put stop signs back up. a one-way one lane round about is the same thing. And no one walks on GreenBag road so a sidewalk is uncalled for...i have not spoke to one person that thinks THIS is a good idea for any of this whatsoever.
114	I oppose the current greenbag road improvement project. This did not have an environmental impact analysis study to assess the human, environmental, and health impacts of this project. This project destroys the Conscious Harvest Cooperative community garden, which supports 15 families to increase healthy food access. This issue should have a full impact analysis to assess impacts.
115	This project is taking away land from a nonprofit aimed at making our state a healthier place. The property at green bag is farm owned by a Morgantown family with deep ties in the community. They deserve better.
116	This project is a bad idea on more ways than one. Heavy truck traffic will continue downtown. The traffic circles around town create enough confusion. Please use these funds to repair existing state roads. The current state of our roads is absolutely disgusting. Have a look at all of the bridges alone in our district! Not to mention the road surfaces. If we want to ruin the little farm land that's left why don't we add ramps to access i68 from Kingwood pike.
117	This roundabout will have a negative impact on the local farmers and growers in north central West Virginia. You shouldn't annex this property and take it away from all the local people taking advantage free farm land. We also have big plans for that acre of property down the road. We are going to establish a opportunity for morgantown which will bring jobs and money to this county. Dont make this mistake!! The light at this 4 way is doing a fine job. How about using the money to fix roads instead of building new ones.
118	They should make a turning lane onto Dorsey and one onto The Pike. They won't need to spend as much money as a roundabout. Then they can fix some other roads that need worked on.

Comment Number	Comments
119	I am totally against the roundabout that you are wanting to put at the Kingwood Pike Greenbag Road Intersection. There are too many people with logging trucks and tractor trailers who make the turn up the Kingwood Pike who would not be able to go thru a roundabout. This is a totally stupid idea. The one on the Mileground does not work what makes you think one would work at this intersection. What you need is to go back to the original 4 way stop sign. That way people do not pass people waiting to turn in either direction. You can tell by the black marks on the road of the wrecks and near wrecks that have been there. Also if you listen to scanner traffic you hear the wrecks at the Mileground roundabout but that never shows up in the paper or the news. Plus you want to close the Kingwood Pike while the construction is going on. How are the people suppose to get to work or any where else they need to go. That is totally uncalled for also. What you need to do is use the money to fix the Kingwood Pike. It is an obstacle course with all of the potholes and slippages that are on it. There are people who live on the Kingwood Pike now that will only drive on this side of town. They will not go on a roundabout or the four lane roads and they ask others to drive them when they need to go there. I won't even go on the roundabout on the Mileground because of how it is marked. Especially when the arrows go in two different ways at the same time. You all need to come up with another solution to this intersection without a roundabout
120	Please DO NOT put a round-a-bout in on the greenbag road next to the atomic grill restaurant and the community farm.
121	I am opposed to a traffic circle being built over the historic, family owned farmland and 501(c)3 nonprofit organization Conscious Harvest Cooperative. Although I am not in the area as a local, I am from a background in community agriculture and family farming. I've both grown up on farms and worked in agriculture recreationally as an adult. The connection that a community has to its farming families is wonderful and rich. The impact that community farming has on an area is both far-reaching and greatly influential. Healing food insecurity locally can only be a good thing. Making connections between neighbors and fellow community members is a good thing. Creating a resource for lost agricultural knowledge is a good thing. The capacity, culture and resources that this land has as a functioning garden offers a real wealth to everyone in stark contrast to what a roundabout may provide to a select few. There is no continued growth, no family fed, no community aesthetic to be found in furthering the stretch of concrete here. Please reconsider what is best for the community beyond menial traffic concerns.
122	We need to provide a better left turn option traveling west on route 7 for trucks to be encouraged or required to use the Greenbag road to avoid the heavy truck traffic through tight turns into town. Conversely we need to do the same to get back to the Greenbag road to get back to route 7 eastbound.
123	Please, we do not want or need a roundabout at the 4 way intersection at the bottom of Kingwood pike! Please turn this 4 way intersection back into a 4 way stop and take away the traffic lights. My whole family feels this way also! Jenny Hart, James Hart, Rodney Hart and Martha Hart including myself are against the roundabout.

Comment Number	Comments
124	We do not need a roundabout at the intersection of Kingwood Pike and Greenbag Road! The lights need removed and turn this area back into a four way stop again! Building a roundabout is just useless and not needed in this area! The other roundabout's in our little town were unnecessary and from what I understand were placed to help with game day traffic congestion but please do not put this at the end of the Kingwood Pike there a lot of log trucks that travel up and down this area since a lot of the residents of the pike own their own trucking/log trucks and this roundabout would make it difficult for the trucks traveling up and down from the Kingwood Pike. Please consider making this a four way stop again or add a turning arrow to help motorists that are trying to turn right onto Kingwood pike from Greenbag. A roundabout in this area is just ridiculous and a waste of money. Thank you for listening.
125	We seriously don't need a roundabout on the greenbag road!!! Attention needs to be fixing the delapidated roads we already have that are falling in and destroying everyone's vehicles!!! We have to pay money to keep our vehicles safe for the roads but the roads aren't safe for us!!! The only thing Greenbag road needs is turning lanes with arrows....Pay people a decent wage and hire some help to get these roads fixed and I don't mean patched....Thank you!!!
126	Finish the first project, a stop light, by adding the turning Lane it desperately needs. Why start another project when you didn't finish the first one? Of course traffic is bad no one can turn left add s turning lane not a roundabout
127	As a Monongalia County resident, I strongly disapprove of this project. This is an extremely invasive, unnecessarly large project that is quite frankly over-thought when a simple TURNING LANE and SIDEWALK could be a perfect solution for the state's "F" rating for the traffic report. A project of this size is ludicrous- taking land, spending lots of money, and claiming no human impact? There are way easier, more cost-effective, less environmentally and humanely harmful solutions. I hope our State and our Governor listens to the peoples' pleas, for once.
128	Hello, My family owns the Hastings Farm and I also work full time on the Greenbag Road at BlissBlissBliss in About Town Place. My children went to South Middle School off the Greenbag Road as well. I am familiar daily with its traffic flow and patterns. The build up of traffic only occurs at 4:30-5:30 due to Mylan office workers ending at 4:40-5:00. It is my sincere request, that you consider putting in a traffic light with and arrow and a turning lane instead of a roundabout. I am also concerned about the traffic back up, due to a roundabout, in front of my place of employment at About Town Place, 3101 Greenbag Road. Feeding into Roundabouts from 2 lane highways can result in congestion. I have seen this on Rt. 705 and the Mileground, a road i take daily to work. In addition, my family owns the Hastings Farm and will greatly be affected. My children have worked hard to secure community and farm status in order to continue using this green space as a farm, which has been in our family for 120 years. I am also concerned about the accountant who bought a house on the corner of Greenbag road and Dorsey Ave, in order to do business there recently. I am also concerned about the back up of traffic on Dorsey Ave at 5:00, a road I will daily be taking to work beginning June 1. Please, Please Please, reconsider the large roundabout to solve traffic flow, and consider a turning lane instead....this would be so welcomed!

Comment Number	Comments
129	Strongly disagree with the roundabout at kingwood pike x greenbag rd. I am very concerned the State's plan claims No Human Impact, therefore have an Categorical Exclusion. There is clear human and environmental impact to agriculture land where the proposed round-around would be located. This is unacceptable. We request a full environment impact assessment and reassessment of the CE. {Categorical Exclusion are actions which: do not induce significant impacts to planned growth or land use for the area, do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.}
130	We are writing to you today to strongly oppose the roundabout plan for the greenbag rd improvement project. The need to move truck traffic out of downtown should not come at the expense of destroying vital farmland that provides real food resources to low income community members throughout the greater Morgantown area. It is not economically responsible to spend over 10M on a minor turning traffic issue at the intersection of Greenbag rd and Kingwood Pike. We respectfully request an alternative plan with less environmental and sociology-economic impact.

Comment Number	Comments
131	This is about a new project plan by the West Virginia Dept of Transportation to put a large roundabout at the Kingwood Pike and Greenbag Road intersection. These plans would significantly impact our community due to the total acreage they wish to acquire/annex via eminent domain. The State's Environmental Assessment of the project rendered it a Categorical Exclusion (CE) for expedited approvals without traditional public comment because the project claims "no significant human or environmental impact." This exclusion is unacceptable. We request a full environment impact assessment and reassessment of the Categorical Exclusion. The project WILL affect land use for the area, have a significant impact on natural, historic and agricultural resources, and significantly impact air, noise, and water quality. We are open to alternative solutions including a turning lane, turning signal, expanding of the road, building sidewalks, or adding signs. _____ This land is a: 1. Community green space. 2. Family-owned and operated farm of 117 years. 3. Home to Conscious Harvest Cooperative, an established Non-Profit organization, 501(c)3, working on alternative food sourcing strategies to combat food insecurity and increase food access in Morgantown, West Virginia. 4. Recreation space, including a wild mint and wild mushroom foraging area. 5. Participating WV-permitted industrial hemp research program. 6. Established Garlic Bed that supplying to local families and restaurants. 7. WVU Agronomy student research and project growing area
132	I strongly oppose a roundabout / traffic circle at the corner of Kingwood Pike and greenbag road. I support a turning lane alternative solution at the corner of Kingwood Pike and greenbag Rd.

Comment Number	Comments
133	I am distraught to hear that a traffic circle is being planned to be built over the historic and family owned farmland and 501(c)3 non profit organization Conscious Harvest Cooperative. Our land throughout the states is gradually being cut down and destroyed in time, and those familiar with environmental studies understand the impact of tearing down areas that are naturally in symbiosis with human chemistry and well being, including impact on our neurotransmitters and electron exchange with the earth. Oases such as these are already becoming fewer and farther between in time, and we the people on the land only want it to stay. I live three hours away, yet I personally frequent this particular farm as often as I can. The last time I was there was in July, and I still have garlic that was gifted to me from their bountiful crop. Conscious Harvest Cooperative combats food insecurity - a major deficiency in this great land of the United States. As stated, I am still cooking with the crops I was given closing in on almost a year ago now. This farm massively produces for the community. From what I understand, the garlic is also given to local families and restaurants. This impacts our community greatly. In addition to this, WVU students come to this location specifically to enrich their knowledge in a real community setting. This area is priceless and a growing niche in Morgantown. It is a community green space. It is a haven to the family who has owned and operated it for over 100 years. Please consider the voices of those who maintain, learn from, and are enriched by this land.
134	*Update to a previous comment* I do not support a major change to this intersection. I previously commented about a lack of traffic to justify this project. I left work early one evening when the students were still here and even at 5:30 pm there were 3 cars TOTAL at the intersection. The only times I have seen a back up it is one way. The other lane is totally clear. A turn signal is the answer. I also checked the MMPO's website and a roundabout goes against what they have suggested for a Greenbag Road plan. It clearly states a signalized intersection here. I don't know anyone who supports a plan that requires a detour. In fact I support NO BUILD if there is a detour. People are complaining about this issue online. It is clear no one from Charleston is familiar with this area. Aarons Creek Rd (listed as a detour for the VERY busy Kingwood Pike) is so bad that the residents who live there are posting about it. Residents who live on Aarons Creek and are familiar with the road and have 4 wheel drive vehicles have ended up IN the creek recently. Residents have also taken bags of cold patch in attempt to repair the road themselves as Dist 4 is nonexistent for help. IT'S THAT BAD. I don't own a 4 wheel drive nor can I afford one. The Kingwood Pike is falling apart currently and is bad enough on my car. Do you realize residents will be unfairly "trapped" because of this plan and could lose their jobs. I have no back up truck as transportation and will have no way out. Even the people who can stay home will have trouble getting packages from UPS as those trucks will have to take Summers School Rd. This is an 18 month to 2 year project! The mileground project isn't even close to being finished and it was started years ago. This isn't a "minor" inconvenience to anyone. I hope you listen to the people. Thank you for your time.

Comment Number	Comments
135	I am against this project as proposed. It was initially presented to the public as a simple widening of the road and adding a turn lane. Now this has changed. I am against a roundabout here. Every truck driver I have spoken to feels the same way. This project will make this area very unsafe. I travel this road daily and there is only traffic at peak hours. At noon there are approximately 6 cars max sitting at each lane of the intersection. At 7:30-8 pm there are 2 or 3 cars. Sometimes none. I am the only car. For that reason alone I feel this is a HUGE waste of money considering the other pressing needs currently in our county. (Pavement replacement that is 20+ years past due should be at the top of the list) Please set up cameras so you can see that I am giving an accurate account of midday and evening traffic during the week. Lastly, a detour for Kingwood Pike residents is not feasible. This is a busy rural road and there are no roads to detour to that would be acceptable. Thank you for your time and considering actual resident's objections that drive this area daily.
136	The proposed roundabout runs through an existing community garden of which I am a multi-year member. This green space has helped my family and I grow food to feed ourselves and is a valuable community resource. This garden is also the only one like it that existing in Morgantown. I would like to see it remain intact. Thank you for your consideration.
137	I support installing 2 roundabouts on Greenbag Road. However, part of this project that does not seem to have been brought up in the documents available for this project, is the closure of access from Sabraton Avenue to Route 7. I would encourage the DOH to explore options that will avoid shutting down access to the Norwood and Jerome Park neighborhoods by prohibiting access from WV 7 to Sabraton Avenue. Thank you.
138	Please stop round about.
139	The proposed changes to Greenbag Road will cause too much damage to existing agriculture, social, and educational space. The family farm and local nonprofit which will be displaced has created an unparalleled program in Morgantown. I believe there are better plans which would allow existing farms and buildings to remain in place. I disapprove of the current plan
140	I live in Preston county and I work in Morgantown. I also own a second home in the city of Morgantown in South Park. I drive through the Kingwood Pike and Greenbag Road intersection at least twice a day, sometimes more. I am in full support of a round about in the intersection and any other improvements to aid traffic moving.
141	This project is a not a good idea. I support farmers but that aside, put the money to what matters. Work on traffic where the real issues are and fix potholes. Do not put a round about here.

Comment Number	Comments
142	I do not agree with the proposed Greenbag Road Upgrades. I heard this is being done because of traffic. I live on the Kingwood Pike and travel the Greenbag Road everyday, in some cases SEVERAL TIMES a day. The ONLY time there is traffic is when it backs up from the light to the Kennedy Center. Which is between 4:45pm and 5:14pm, Monday through Friday ONLY. THAT'S IT!!! Any other time you travel this road except for the half an hour you could go without seeing ANYONE! At the 4-way light more often then not I am the only one sitting at the light. This makes No sense to me. Money MUST BE SPENT on REPAIRING our roads and ditches. Travel the Kingwood Pike and tell me that this is acceptable. This winter the pike was treacherous from the Greenbag Road intersection to and through the slippage due to ice from the lack of ditches. Several years ago there was a concrete berm installed on the Pike from the intersection to just before the bridge. This has done nothing but make the water drain INTO THE ROAD. We need help before someone is killed. Stop the Greenbag Road project and put money into the existing roads.
143	I think the roundabouts are a great idea. They work really well when drivers know how to use them
144	This is another stupid idea someone has. During rush hour traffic only one way gets to go. You risk your life every time you drive through a round about. Make turning lanes with a light. Now this makes more since.
145	No to the round-a-bout. Is not needed, going to make a heavily traveled area more congested. Look at how worse the mileground is. That did not help the flow of traffic. Stop waiting tax oayers money, fix the existing roads that are covered in pot holes.
146	A roundabout on Green bag would not be good at all and even worst on kingwood pike intersection. can you see the accidents in winter when roads are slick and there are 2 inclines at the intersection on Kingwood pike area
147	A round a bout on greenbag road would be terrible the lights work perfectly fine. The real issue is the state of disrepair of our roads the roads we pay taxes for not a unwanted unnecessary round about.
148	Taking away a source of sustainable food and food security in our town is GROSSLY IRRESPONSIBLE
149	I fully support the roundabout project to improve traffic flow
150	Putting a round about on Greenbag road is a waste of resources. The intersection is congested due to a out dated traffic light. With sensors and a properly timed traffic light these issues could be remedied. Clearly these decisions are being made by people that do not frequent this area. Put our money to use in repairing our existing roads and infrastructure.
151	I live in Preston County and work in Morgantown. I travel the Pike everyday. I would much rather see this money put towards fixing the potholes that are destroying my car than putting in a roundabout. The roundabout at the Mileground is a disaster. It wasn't properly done, and there is still a huge backup of traffic there. I envision a similar situation here. There is farm land right at Greenbag Rd that will be affected. As a landowner myself, I would be furious if the state came in and took over my land. Please fix the existing roads before wasting the taxpayers money on upgrades that aren't a necessity at this time.

Comment Number	Comments
152	I believe that Aarons Creek and Lower Aarons creek roads are unsuitable for a detour route. There are numerous pot holes and almost unpassable areas on both roads. Many areas are one lane and cannot accommodate traffic. An area just downstream from the bridge cannot accommodate large vehicles. The road is narrow and there is a ten foot drop off into the creek. Several vehicles including a DOH truck have ended up in the creek. I lived there at the time and witnessed the whole thing as well as others. There is already so much traffic that it is dangerous crossing the road to get the mail or news or newspaper. I would hope that a different solution could be found.
153	A roundabout at the intersection of greenbag road, Dorsey ave, and kingwood pike is unnecessary. To fix the traffic flow there should be added turning lanes on greenbag road and arrows on the traffic lights for vehicles turning on Dorsey and kingwood pike. The construction is going to be terrible for the school buses traveling to and from south middle and mountainview.
154	Who owns this land?? Have you secured the land? Isn't that where the community garden is? Where do you get the right to take land like this?? What about the retaining wall for water drainage??
155	We have enough round abouts in this town. This farm brings the community together and that's what the community wants. We elected u guys to give us what we want, we dont want any round abouts
156	Community gardens are more important than a Roundabout
157	A roundabout is way more excessive than what is needed; a turning lane and a sidewalk
158	Against this destruction project. Turning lane is the improvement. Roundabout is absolutely devastating and frankly, a stupid idea.
159	Turning lane! Roundabout is the worst idea in the world
160	I'm horrified at the idea of taking land from people to build this roundabout. We need a four way stop, or turning lane and a sidewalk, which can be done without impacting a community garden.
161	A roundabout is a gross misuse of funds and can be avoided by simply adding a turning lane and potentially a sidewalk. There is no need to take a bunch of land from the surrounding areas, this would also affect the non-profit garden that is in the area which would have a lot of human impact.
162	No roundabout please! A turning lane is a much cheaper option and has WAY less impact on the local environment.
163	As a west Virginia native I am appalled at this plan. I heard it through the grapevine. And there's no more meetings? Excuse.my french but WT... ?! Why would yall but that enormous.circle at the bottom of that hills gonna kill someone in the winter! Y'all are being stupid and all shady. We been on the pike for decades, and we are AGAINST this plan. Put in a side walk and a turning lane to go with your fancy signal light and leave the land alone. Grrrrrrrr there ain't gonna be any more grass in the world if people like you keep taking it all, without permission. Any one of those engineers think?
164	Fix the roads and put in turning lanes with turning signals. Roundabouts are more dangerous than the current set up.
165	We need the slide on River Road fixed before the state squanders millions on a project that nobody wants. I think you are only allowed one comment unless you use different name. I have a kingwood pike friend who will lose her job with an detour (project is going to take 18 mos to 2 years) Otherwise she will have to buy an OFF ROAD vehicle to make it down Aarons Creek Rd. Nobody on the pike except Raese wants it.

Comment Number	Comments
166	District 4 DOH can't maintain our road worth a shit and they wanna put in another roundabout that nobody wants? No!
167	I live on Marcus Drive off Dorsey Avenue and use the Dorsey/Kingwood Pike intersection daily. I DO NOT believe a roundabout is the solution to the traffic issue. All that intersection really needs is a left turn lane with left turn signal to turn from Greenbag Rd to Dorsey Ave. With the amount of tractor trailers and school buses that use Greenbag Road, I do not think they would be able to navigate the roundabout, I do not believe there would be enough room. And I also think it's unfair to just take away the nice green space used for farming and agriculture. I believe the co-op uses that space as well as WVU students. Please consider adding a turning lane before paving and forever destroying the nice shared green space at that intersection. Thank you!
168	I am from the Morgantown area and would love to see the plans include turning lanes... I think taking away from the community to do another round about is not the answer
169	A turning lane and a arrow is all this needed too many large log trucks etc to be a roundabout, we are CDL drivers and roundabouts would make turning there a lot worse and we live on the pike we have to come through there
170	No roundabout. Would love to see the pike roads be fixed and paved before a roundabout is thought about. A on off ramp at the pike bridge onto the interstate would be wonderful. I also believe turning arrows or bring the 4 way stop sign back would work out way better then a roundabout! The roads definitely need fixed, paved, ditches cleaned before a roundabout!!
171	Adding to my previous comment- with all the big trucks that travel up and down the pike a small roundabout would never work out!!
172	I have lived on and traveled the Kingwood Pike for 48 years. I do not think that the proposed roundabout is a good idea. Going back to a 4 way intersection and and or adding turning lanes would work better and not destroy family farm land. I would rather see the money spent on improving the existing road ways and I would much rather see entrance and exit ramps be built giving access to the interstate which would reduce the amount of traffic traveling thru the intersection and on to the Kingwood Pike which would also help with the constant caving and collapsing road between the interstate overpass and greenbag rd intersection. I know it was proposed several years to make access to the interstate from the Kingwood Pike along with making the road wider but was declined due to the multiple petitions and objects from the community which I agree with because of so many homes and properties being lost due tim the widening of the entire Kingwood Pike which is not needed.

Comment Number	Comments
173	I am writing to express my strong concern for the proposed Greenbag Road / Kingwood Pike roundabout project in Morgantown, WV. The plans have not gone through a process of democratic consensus, nor have they fully taken into account important social and ecological impacts of losing nearly an acre of viable agricultural land and greenspace at the edge of a rapidly urbanizing city. The road expansion would eliminate a community garden that has played a key role in fostering community food security projects in Morgantown for the past 5 years. Garden spaces there currently provide opportunities for city residents without access to land to grow food. Garden programs offer healthy food access to low income families at risk of food insecurity. For example, in partnership with the Friendship Room, residents recovering from substance abuse have engaged with garden activities over the past three years and residents from Marjorie Gardens, the nearby public housing complex participate as well. I am surprised that the state would prioritize the construction of a roundabout in a place where traffic patterns do not currently warrant such an investment, particularly at a time when so many other urgent road repairs are needed across Monongalia county. I urge you to consider alternative solutions that do not place this important community site at risk of further unnecessary urban encroachment.
174	I travel this road on a daily basis for work and believe you are misguided in your thinking to install a roundabout. The area it would affect would negatively impact local businesses and is unnecessary. The current stop sign works but at the very least if you feel any change then a light w turn light signals might be sufficient if any changes were to take place
175	Please find a new place away from the farm to use for roadways and roundabouts! This farm means so much to my family and it has a legacy here in morgantown. Please please respect the earth
176	I oppose the proposed round about on Greenbag and Kingwood Pike in Morgantown, WV. As a member of Conscious Harvest Cooperative, small business owner in Morgantown, and long-term resident concerned about the loss of access to communal gardening, food production and food justice educational space in my community. The proposed project would be consuming a large portion of the community stewarded food production land. I am whole heatedly opposed to this project, due to my own participation in Conscious Harvest, but also a community member concerned with safety and necessity of this particular round about.
177	I'm glad you guys are embracing roundabouts it would be nice if they were everywhere. The only place in Ireland I ran into traffic was where they had red lights instead of roundabouts.
178	Gardens are more important than round-abouts
179	Removing this collective garden space and community haven would cause consequential impact for historical folk life of mon county. Please focus on areas of traffic with greater congestion.

Comment Number	Comments
180	Please stop putting roundabouts in our town. There are far too many people which causes congestion, and a high number of young drivers, many who are not from our area and do not drive well enough for roundabouts. Our roads need widened to handle the over populated area, and paved to keep our vehicles free from so much damage. Please address the more important, functional issues before planning something like this.
181	Although I am sure there are many negative comments about this project I am much in favor, particularly of the use of rotaries to speed traffic flow. Before the first modern rotary was installed in the Mileground section of Morgantown I had my doubts, but after using it for a while I realize that it is very different than the rotaries I have experienced in New England, along the eastern Seaboard, and the Western Reserve of Ohio as, unlike these colonial relics, they are designed to facilitate modern traffic flow. The major problems I see at this point is that more public education as to how to properly navigate modern rotaries (for some reason many can't just learn to follow the signs and arrows) and that combinations of rotaries and traffic lights can slow traffic as is currently the case on the Mileground that needs one at the other end to make it work. Count this as a vote in favor of current DOH highway modernization in the Morgantown area.
182	Where are images for the proposed roundabouts??
183	While the decision to construct roundabouts at Kingwood Pike and Mississippi St causes concern, my chief concern is with the detour routes during closure of Kingwood Pike. The Aarons's Creek detour is NOT suitable for two-way traffic of the volume that is usual on CR 81 Kingwood Pike). To be suitable as a detour this road would need substantial widening and paving. There are portions of the upper segment that are too narrow for cars to pass safely. Of concern also is the truck detour utilizing Summers School Road. This road is not suitable for large truck traffic in that there are sharp curves that cannot be navigated by large trucks without using both lanes. There is also one curve closer to Rt 7 that semis cannot negotiate, evidenced by the number of trucks that have failed to negotiate this turn and had to be towed out. Lastly, with an increase in traffic, some sort of traffic control would be required at the junction of Summers School Road and Rt 7. Even at the present time, traffic backs up significantly at this location causing both delays as well as dangerous behavior with motorists trying to turn onto Rt 7 into a continuous stream or traffic.
184	I have three concerns about the proposed approach: 1) There are several areas of Kingwood Pike near Greenbag Road where the road is in the process of slipping and sections of the road appear to be in the process of falling off the side of the hill. It seems that preventing a current road from collapsing should have higher priority over traffic pattern adjustments. 2) During Stage 2, the plan is to divert traffic to Aaron's Creek Road. Has the condition of Aaron's Creek Road been assessed to confirm that it can accommodate continuous 2 way traffic? 3) If the goal is to increase large vehicle traffic on Greenbag Road, are roundabouts conducive to large vehicle maneuverability?

Comment Number	Comments
185	I have several concerns with the proposed round-about at the intersection of Greenbag Rd and Dorsey Ave. 1) I often see trucks jumping the curb at the round-about on the Mileground. How will this be designed differently so this does not occur? 2) The connecting Kingwood Pike is in poor condition with several slips and potholes. These have been repaired several times recently, but the job was not done properly since it keeps occuring. One reason is the large amount of water that erodes the road and eventually runs down Kingwood Pike towards the Greenbag Rd. intersection. In the winter this typically freezes resulting in cars sliding down the hill unable to stop. 3) The proposed detour through Aaron's Creek Rd is in extremely poor condition and one lane in spots. It cannot handle the amount of traffic you propose to put on it.
186	This land is a: 1. community green space. 2. family owned and operated farm of 117 years. 3. Home to conscious.harvest.cooperative an established nonprofit working on alternative food sourcing strategies to combat food insecurity and increase food access in morgantown westvirginia 4. recreation space, including a wild mint and wild mushroom foraging area. 5. Participating WV-permitted industrial hemp research program. 6. Established garlic bed that supplying to local families and restaurants. 7. wvu agronomy Student growing garden Please do not destroy these beautiful farm lands. It would be a tragedy.
187	Green bag road does not have a traffic problem, however the lower section of Kingwood Pike has a serious paving problem. Please use the resources to repair the Kingwood Pike. Thank you.
188	Leave it alone. Leave people's land alone. That area you're taking is a great co-op area and heritage land. Leave well enough alone. Try fixing the 10,000 potholes and stick what is working. You can't fix the roads, you say no money. Well take the money from this stupid pathetic idea and put towards roads. We pay for road usage from our paychecks but apparently it's lining wallets not road repairs. LEAVE WELL ENOUGH ALONE!!!!###
189	I am against the roundabout at Kingwood Pike!
190	The proposed Kingwood Pike roundabout is unnecessary and unwelcome to neighborhood. This is taking valuable green space away. I say NO. Even roundabout down the road is not helpful
191	The 2 round abouts is a waste of time and money. Put a light in that can account for turning and move on to maintenance on other roads
192	Please don't construct the roundabout! I don't agree with the construction plans, I think constructing a roundabout is unnecessary! It will cost a lot of money and take away land from the lovely farms that are around the area.
193	My family adamantly abject to the round a bout proposal at the Intersection of Greenbag Rd. and the Kingwood Pike. No one wants it. The residents who live in this area need to be heard. The pike is crumbling and falling down and has been for years and yet you overlook that and propose wasting money on a round about? No. It would be a nightmare. Put in turning lanes and the problem is solved.

Comment Number	Comments
194	As a resident of the Kingwood Pike I am adamantly against this project. Did you even bother to contact residents in this area for feedback? Of course you didn't. It's full steam ahead and who cares of the hurt in the process. This is not necessary and a complete waste of funds! Did you consider bus traffic? The value of the home that is undergoing extensive renovations at the start of Dorsey Ave? The impact on the farmer whose land will be snatched from them? The round about at the mile ground is a complete nightmare! We do not want that same disaster over here. Make turning lanes and the problem is solved. I've lived on the Pike for nearly 15 years and I assure you NONE of us wants this! How about you fix the collapsing Pike and address the poor road conditions??? Just another way to bully and make a bigger mess!
195	We differently do not need a roundabout at the intersection of Kingwood Pike. They do not work. I drive the roundabout on Mileground every day. Sometimes I sit in that traffic for 10 or 15 minutes. People blocked the exits and entrances and traffic can't move. Please fix the road on Kingwood Pike and Cobun Creek Rd. A roundabout is a waste of taxpayers money.
196	I think a turning light would be better.

Comment Number	Comments
197	I am writing to you as a seed farmer and one of the board members of the Conscious Harvest Cooperative (CHC) that offers the only community garden space available in town to the residents of Morgantown in a region that typically has steep terrain. We recently found out that the WV Department of Transportation proposes the construction of a roundabout at the intersection of Kingwood Pike and Greenbag Road, acquiring a significant portion of the community garden. The garden has critical importance to teach kids and families about the sustainable use of natural resources, resource management, environmental protection, as well as about growing food, food justice, and positive impacts of local, clean and fair food on human health and local economy. The garden is also an experimental space utilized by WVU undergraduate and graduate students as part of their internship and/or project assignments. I strongly oppose the roundabout proposal that takes our garden space away, and I also strongly believe that we can work together to come up with alternative solutions. I am writing to you as a seed farmer and one of the board members of the Conscious Harvest Cooperative (CHC) that offers the only community garden space available in town to the residents of Morgantown in a region that typically has steep terrain. We recently found out that the WV Department of Transportation proposes the construction of a roundabout at the intersection of Kingwood Pike and Greenbag Road, acquiring a significant portion of the community garden. The garden has critical importance to teach kids and families about the sustainable use of natural resources, resource management, environmental protection, as well as about growing food, food justice, and positive impacts of local, clean and fair food on human health and local economy. The garden is also an experimental space utilized by WVU undergraduate and graduate students as part of their internship and/or project assignments. I strongly oppose the roundabout proposal that takes our garden space away, and I also strongly believe that we can work together to come up with alternative solutions. I am writing to you as a seed farmer and one of the board members of the Conscious Harvest Cooperative (CHC) that offers the only community garden space available in town to the residents of Morgantown in a region that typically has steep terrain. We recently found out that the WV Department of Transportation proposes the construction of a roundabout at the intersection of Kingwood Pike and Greenbag Road, acquiring a significant portion of the community garden. The garden has critical importance to teach kids and families about the sustainable use of natural resources, resource management, environmental protection, as well as about growing food, food justice, and positive impacts of local, clean and fair food on human health and local economy. The garden is also an experimental space utilized by WVU undergraduate and graduate students as part of their internship and/or project assignments. I strongly oppose the roundabout proposal that takes our garden space away, and I also strongly believe that we can work together to come up with alternative solutions. I am writing to you as a seed farmer and one of the board members of the Conscious Harvest Cooperative (CHC) that offers the only community garden space available in town to the residents of Morgantown in a region that

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Comment Number	Comments
198	WOW. Do I even gotta comment on why this shouldn't happen? I don't wanna get carpel tunnel writing it all.... We better get a community meeting on this... Where is the communication?!? Governor Jim justice better make his way to Mon county and HELP.... Give us some reason to get his approval rating up.. we r fed up here. Wow.
199	As a contributor and supporter of the community farming and farm co-op programs being generated from the work at the Hastings family farms, I strongly oppose the project plan as currently proposed. i would prefer a plan that minimizes land usage of the Hastings property as it is a beautiful, lasting and shared community spot which is rare close to town and should be preserved. I believe some turning lanes and sidewalks may be a better approach and diminish the amount of land needed for a more efficient traffic crossing. Thank you for your time and attention.
200	It's not an improvement by any means. We are against it ! 1.there is no good detour route. 2. They need to fix the pike and roads that exist instead of building new ones.3. Nothing wrong with the way it works now if they would just simply put a turning lane and arrow light up for all sides. 4. We have an inside voice that told us the people who come up with the round about ideas don't even live here they didn't even know the one on the mileground doesn't work they are just using what works in the big city we are not a big city they are trying to cram a big city in a little hick town.5. All the big trucks that travel this road they would cause accidents because they don't make them big enough and they are so heavy it will just break it up within a year or Two!! We don't want this
201	The two round abouts being discussed for the greenbag road is the most irrational decision this town can make there is not enough traffic to justify it for one thing also all the big trucks that travel greenbag will not be able to make a turn on a round about thirdly if u think it will help the school traffic it won't just look how bad the one on 705 is it's a nightmare besides all these reasons don't waste money on this project when all the roads in this town are in desperate need of repair the pike is ready to cave in use the funds for its repair before somebody gets seriously hurt or killed don't let people who don't live in this town tell you what needs done they have no idea listen to the people who travel these roads every day if you want to do anything at all just add a turning lane it makes more since
202	I use the Greenbag Road in Morgantown on a weekly basis - Greenbag DOES NOT need a roundabout! A left turn lane with a left turn signal on the light on just Greenbag, (not Dorsey & Kingwood Pike) would solve the majority of the congestion and at far less cost! A simple problem with a simple solution! NO ROUND ABOUT!!
203	Why couldn't the DOH purchase Hardees restaurant and tear it down and create a four way interchange controlled by a stoplight. A turn lane from rt 7 to green bag road could be created. Hardee's restaurant could then purchase land where the sabraton avenue did intercept rt 7 and adjoining the barbecue diner across from cvs. Rt 7 could then be widen to 4 lanes with a turning lane where appropriate from long john silvers to Burger King restaurants on rt 7. This should move traffic smoothly. Create a four way intersection where Hardee's is today. Give a new place for Hardee's to relocate and also keep sabraton avenue open for local traffic. Thankyou

Comment Number	Comments
204	Please do not use any round abouts on the GREENBAG ROAD PROJECT. For Please reconsider using roundabouts on the Greenbag road project. I do not think it would be a good fit because of the heavy trucks and the heavy vehicle use trying to maneuvering it. Why make the road harder to navigate. Look at the roundabout on the mile ground traffic does not allow people exiting Eastwood grade school merge into traffic. The green bag road would be the same for people trying to exit Dorsey avenue and street leading to south middle school. Roundabouts might move traffic but the high traffic and you mix senior citizens and college kids in the mixture is an accident waiting to happen. I'm a senior citizen and I can confirm that. Why can't you use stoplight. Thank you
205	Please stop putting in round about. They only work if installed properly and people use them correctly which they don't because either they don't know how to use them or they are just think of themselves being in a rush and ignoring other's turn to go. Why not install sensors on the lights and adjust times according to high traffic times. People are too selfish anymore to consider other people.
206	This is a poor error in judgement and costs. I travel this road every day. A green area turn signal for both turning onto Dorsey and to the Kingwood Pike would a lot cost effective. This round-a-bout idea is totally unnecessary. If any planning this would travel 705 every day from 4:00-6:00 would see the back-up of traffic. The traffic from down town can be backed up to Darst Street also. Why would the DOH spend that amount of money on a project that isn't going to solve anything. Please, please reconsider this decision. Thank you!!!

Comment Number	Comments
207	I am a Morgantown resident that travels along CR 857, CR 81, and CR 1 by vehicle and/or bicycle. The current status of these intersections makes it dangerous for travel by any mode because of lack of visibility and continual congestion due to high traffic load. I am also a member of the Conscious Harvest Cooperative that uses land at the corner of CR 857 / 81 for farming and supporting local food accessibility for low-income households. This project proposes using this land to construct the new intersection. I fully support this project in constructing roundabouts at the intersections of CR 857/81 and CR 857/1. I also support the inclusion of dedicated bicycle lanes, but highly suggest that they be placed on the road side corresponding to their direction of travel, instead of only the west-bound side. Sidewalks are also of utmost importance and I support the sidewalks in this project, with some extension. As a safe route to school, I suggest that the sidewalks be continued past the Atomic Grill and up Dorsey Avenue to Luckey Lane and continue the full length of Luckey Lane to the Mountainview Elementary sidewalks and parking lot. This extended sidewalk is of extreme importance to the safety and well-being of school-children and the community. I regret that portions of the community gardening space for the Conscious Harvest Cooperative and the Joy and Hemp Universal permit grow-site will be claimed for the proposed intersection and road construction. However, improved traffic flow, and pedestrian and bicycler safety is required along this corridor. I believe that the proposed project will satisfy these scenarios. I fully support widening of the road on CR 857 as well as roundabout construction at the intersections of CR 857 / 1 and CR 857 / 81. I would not support this project if the proposal was traffic lights at the said intersections.
208	I say no to the roundabout should be able to claim peoples land just for progress plus I don't believe it will be a good idea there I think if the light timer was longer on the greenbag road that would help more than anything
209	Please do not go forward with building this, it will take away vital farmland which grow crops. This is unethical and unnecessary I hope you do the right thing and do not go forward in destroying the planet for these “upgrades”.
210	Please consider a tuning lane instead of a roundabout
211	People against the roundabout. How is this a categorical exclusion? You’re going to destroy a farm and peoples' livelihood - how does is that warrant exclusion?! There are so many options: turning lane, 4 way stop. Add a sidewalk- go ahead. But this rounabaout thing has gotten out of hand it makes no sense here and the people who have created this plan act like it’s the ONLY and LAST option? Yeah right, what’s the motive here? Because it’s not the traffic issue, we all know that stop light only works with a turning lane. This isn’t rocket science. NO ROUNDABOUT

Comment Number	Comments
212	In order to document the “grass roots” effort that occurred on the Greenbag Road Improvement Project, I would like to *summarize* the comments that were received by phone. A summation of the exact number of voicemails and messages did not occur due to various factors; · I was not aware of the action being taken by the public until some time into the comment period and no “tallies” were documented. · Many of the voicemails were incomplete; messages such as “No roundabout”, no name given, address etc. were received. In my opinion a vast number of the calls were overwhelmingly opposed to the roundabout. As an example between the end of business 5/16/19 and the morning of 5/17/19 fourteen voicemails were recorded of which one was for the roundabout and 13 were opposed. I have also included the newspaper advertisement that was used to alert the public to the project.
213	I’m against the Roundabout. I live right off Greenbag and I volunteer at the community garden there. A simple turning lane on each side will suffice. Thank you and God bless
214	Anyways I live on Dorsey Lane and I use that intersection everyday of my life with NO PROBLEM there is NO NEED to make a roundabout there all it is going to do is cause accidents because people don’t know how to drive here already. I don’t know why we are so concerned on making a roundabout somewhere where we don’t need one instead of fixing all the craters in these roads the road right beside the school on Dorsey Lane is the worst road I’ve ever seen and been like that for years yet NOTHING DONE ABOUT THAT cause guess we care more about less traffic which there barely is any than fixing the potholes so we don’t have our cars damaged or cause an accident. This just don’t make any sense.
215	No,no no! A round about let alone are not needed on the Greenbag road. It will cause more issues Including traffic jams, wrecks etc. the one on the mileground has been a complete failure except in the eyes of the politicans
216	I am a 37 year resident of the area where State Project: U331-857-0.67 00 is wanting to be completed at the intersection of the Kingwood Pike and Dorsey. I believe by simply putting in turning lanes would be a more practical approach, and less invasive then the proposed round about.
217	I oppose the greenbag road improvement project roundabout. A turning lane should be used instead. This impacts the surrounding businesses, food security programs, and living arrangements of low socioeconomic status residents. Please conduct an impact analysis.
218	As a resident of the Kingwood Pike area.....I think putting a roundabout in at the intersection of Greenbag Rd would be a bad idea. The reason I think this.....is because we have a problem in the winter time stopping at the intersection the way it is when the roads are very slick & icey. I think putting in turning lanes with lights & green arrows would be ideal. Thank you for letting me voice my opinion.

Comment Number	Comments
219	I live on Luckey Ln the road in which you said you plan on widening. I have had many concerns on this road since we moved here a couple years ago and no one wants to help me, so with this project hopefully you guys will help, especially now if you widen this road it will make matters worse! People drive this road A LOT due to them bypassing the 4 way intersection of Dorsey and Greenbag. The problem we have is people FLY on this road! I have fought for Speed limit signs and speed bumps so far only one speed limit sign was posted and of course no one obeys it. They said they wouldn't put speed bumps in city limits or something of that nature which is ridiculous. Currently the road is to skinny which works to our advantage as SOME people slow down because of being tight passing oncoming traffic. We have almost been hit putting our kids and baby in our car because our driveway is right against the road, school buses have problems pulling out and people have run into the ditch all the time often being pulled out by a tow truck, and they also smack mirrors from going too fast and not having room on the road. It's very unsafe for us, the church, neighbors and the school. Widening the road will most DEFINITELY make it worse as people won't have to slow down to pass each other and I know they will still travel it probably even more with the widening regardless of the new round a bout being put in at the intersection. I don't understand why this road is even being widened its not meant to be a traveled road like that, however i'm not against it as long as we get a sufficient amount of speed bumps installed, even if at least they start from the stop sign intersection of the school to the end of Luckey Ln that connects to Dorsey. It's very unsafe how fast people go for me and my family, the school, and the Church and neighbors. Ive tried to get police to patrol and they don't which they can't sit there all the time anyway and again they don't obey speed limit signs. PLEASE PLEASE install speed bumps I beg you to install a sufficient amount of speed bumps. This will solve the problem of people flying on this road! It will make the school children and all of us safer.
220	It is my opinion that the roundabouts in town need to be larger as well as sloped inward. I can think of several roundabouts in Flemington New Jersey that are so large you cannot see the other side of it. Perhaps Morgantown should model its roundabouts after those?
221	Although the temporary car detour using Lower Aarons Creek Road is the shortest route, it presents significant public safety concerns. Several separate areas along the route are narrow; restricted by trees, brush, culverts, Aarons Creek itself, blind spots, short visibility, and ditches. Cars must find a driveway or wide spot to safely pass. Signs at two locations indicate "Narrow Road Speed Limit 20 mph" which is not followed by most vehicles using this as a "short cut". It is suggested someone drive Lower Aarons Creek Road and confirm it will provide a safe car detour route.

Comment Number	Comments
222	I wish to express my concerns regarding the roundabout proposed for the intersection of Greenbag Rd and Dorsey Ave/ Kingwood Pike. I believe that this development would have a disastrous and irreversible impact on land that I have become very familiar with. As a Horticultural consultant and educator, I recognise the exceptional significance and potential of the land currently being used by a community gardening group and the adjacent farmland. Although I live in Western Australia, I have had the good fortune to visit Wonderful West Virginia on five occasions, staying with family in Morgantown on each occasion. On every one of those visits from 2002 to 2018, I have spent several days on the properties I referred to and have been able to contribute to the development of a valuable community resource. Even though your climate is vastly different to my “semi-desert” country with a 10-inch annual average rainfall, there are many fundamental biological processes that are common globally and which need to be understood and appreciated in order to sustainably manage farming land. Over the years, I have been contributed in a two-way flow of information on horticulture and land conservation principals and practices on these properties by sharing information on water harvesting, permaculture, plant propagation, soil science, composting and many other related topics. It is gratifying to see some of that information now deployed in the establishment of a community garden that can be used to educate people, particularly the young, on the intricacies of successfully growing vegetables or fruit trees for example, without harming the environment. It would be the envy of nearly every city in the world to have a tract of well-watered, arable land, close to town that can be used to not only grow conventional vegetable crops for local consumption, but to also trial alternative plant species useful for other purposes. Opportunities exist. Here in Australia for example we are only just learning about the chemicals in the plants that Aboriginal people had been using for thousands of years as traditional bush medicine, with analyses revealing antibacterial properties capable of combatting resistant infections. In the face of a changing climate, experiments and trials and record keeping and research, all conducted by volunteers, should be valued for the contribution it makes to the community, the state, ultimately the planet, for providing the all important data that we increasingly rely on. If an alternative to the destruction of this land is available, no effort should be spared in searching for it. It is irreplaceable.

Comment Number	Comments
223	My husband and I live in Reedsville but travel to Morgantown everyday for work. I have traveled the Kingwood Pike everyday for 5+ years and it is by far the quickest and easiest route to take. I work in downtown Morgantown so the pike leads me directly in to town. I have never had any issues with the greenbag rd. intersection and feel that the only improvements necessary might be to fix the road where it is falling in or bumpy. Closing the pike to put in a roundabout would cause a huge issue for a lot of people who depend on that route everyday for work. I really have never seen an issue with traffic in this area. And I really believe it would be more of a burden than any help. The roundabout we have in Morgantown already does not work well. Thank you for your time.
224	I would like a turning lane instead of a round-about. No need to destroy a beautiful field that helps supply low income families with fresh local produce.
225	Leave the garden alone. Spend my tax dollars on repairing the roads we have! Shame in WVDOT for considering taking a public use garden to make a roundabout when there are so many other ways to spend our tax dollars! Fix the potholes!
226	Great project! Keep it up! Please make sure to incorporate bicycle and Pedestrian facilities.
227	Turning lane! Turning lane!
228	Please preserve the community garden as you work to update the intersection on Greenbag Rd and the Kingwood Pike.
229	Roundabout is stuip.Before thing of that .Need to be making the safe to drive .what's important rounfasbout or family with kids out for ride.I hope and pray to god it is not that crazy roundabout to have more accident and injury or killing more driver .Sorry POTHOLES POTHOLES !!! Fix Fix
230	I feel that this is a very big mistake to spend millions or billions of dollars on a Roundabout when all if our roads are just horrible and caving in Even the roads that Dot has repaired, patched are right back to the same potholes again. I think they should try a turning signal at this intersection by Atomic Grill to turn up Kingwood pike before spending all that money. Even the streets in town and Mon Boulevard are horrible. Ditches aren't cleaned and brush I'd not been taken care of. Mountain view School Rd was grated and for about 2 weeks it was nice. No gravel or just sparsely spread and is just as bad as it was before money was spent to fix it. It just is a temporary thing. Not really fixing the situation. All roads deserved to be fixed before a Roundabout
231	The round about is an awful idea. I think there should be a turning light so people can turn onto Dorsey. That would solve the problem. I live on the Kingswood pike and all the money wasted on this could go to fix our road. Wherw the road fell in there is a huge jump and if you don’t stop to go over it then it could break your kids necks. its very unsafe and should have already been fixed

Comment Number	Comments
232	No to this project! This project will threaten the conscious harvest community garden. I am the program director of the Friendship House, which is an addiction and mental health drop-in recovery day center. Please view this video/article by abc news about how the garden helps people get into recovery. https://abcnews.go.com/amp/US/west-virginia-community-garden-helps-people-drug-addiction/story?id=61152664 space is so special to us and our clients. We are able to teach people how to grow food and benefit from garden Therapy. I personally support WV road development, but doing so on land that is accessible to our community and a community garden space is not ok. Many people benefit from this garden. Including WVU students, mental health clients, people experiencing homelessness, and other community groups. Please don't take our garden away from us.
233	I support this project 100%. Please continue with the work as planned. Roundabouts are smart and effective.
234	I am writing today to protest. The new project plan by the WV Dept of Transportation proposes a large roundabout at the Kingwood Pike and Greenbag Road intersection. We are reaching out today because the total acreage this projects wishes to acquire/annex/imminent domain has significant public health, environmental, agricultural, individual & community impacts. These impacts have not been assessed. We understand the State environment assessment made a Categorical Exclusion (CE). We are very concerned the State's plan claims no significant Human or Environmental Impact, therefore the project has been granted a Categorical Exclusion, which allows for expedited approvals without traditional public comment. This is alarming. There is clear human and environmental impact where the proposed roundabout would be located. This is unacceptable. We request a full environment impact assessment and reassessment of the CE. {Categorical Exclusion are actions which: do not induce significant impacts to planned growth or land use for the area, do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.} We feel the proposed roundabout is too abrasive and would severely impact our agriculture growth and development activities of the community and Conscious Harvest Cooperative. The land is also widely used by area University graduate and undergraduate students. The Hastings Family has always been happy to offer this land to the community for gardening, food justice events, signage, and advertising for other community events. Community also enjoy harvesting wild mint, foraging for wild mushrooms, and metal detecting actual archeological projects due to old relics and artifacts at this site. We wish to continue to offer this green space for us all to enjoy. We are open to alternative solutions including a turning lane, turning signal, expanding of the road, and building sidewalks.

Comment Number	Comments
235	I honestly feel that this is a misguided project that will do little to nothing of any value as far as improving traffic flow in the Morgantown area. I'm not sure whose brain child idea this is, probably the city of Morgantown who thinks that they can get all the trucks off city streets but two roundabouts in 4 tenths of a mile is a receipt for failure. Tell Mr. Cites that I mailed a letter to him outlining my objections and even suggesting an alternative plan. The letter was mailed Tuesday and may arrive late but since it was mailed before the deadline, I hope he reads in and gives it due consideration, I VOTE NO ON THE GREENBAG ROAD IMPROVEMENT PLAN.
236	I am against the traffic circle planned at Greenbag Road/ kingwood Pike. Winter time people will slide. I grew up in Preston county and drove the pike. We have 2 circles that work in Morgantown- 1 at university Towne center(which is being ripped out and moved and made larger for the football stadium) and WVU Medicine's. The one at the mileground is not a true traffic circle it's on an angle. It's so called fix for traffic is actually worse- it jammed like spokes on a wheel. People continue drive backwards in it. Winter months water flows across and freezes and cars slide into the other lane. We need infrastructure in this town. Turn ins and outs. Was there a feasibility study done on an a entrance/ exit ramp for 68 from the over pass? We need roads fixed, drainage fixed before you start building roads that will not be maintained. Rt7 and Brookhaven rd needs a stoplight for safety of school buses and children; summer school and rt7 needs a light traffic backs up past my housing development. Semis and Coal trucks fly on rt7. People of died at these intersections yet we are worried about traffic circles. Fix what is broken first.
237	To whom it may concern: I am wringing to express my desire to save the Hastings Farm from being taken to build a round about on the intersection of Kingwood Pike and Greenbag Road. Over the years that I have lived here the Hastings have offered use of their land and resources to all who needed. I personally have harvested ramps and garlic and have friends who did them same. I wholeheartedly believe that other traffic solutions could offer relief from congestion at the light, such as a turning lane. Please reconsider the destruction of this cherished farm and consider alternatives to the roundabout. Thank you!
238	Stop destroying natural spaces that make our home among the hills so special.
239	I would like a turning lane and not a roundabout
240	I am against the roundabout on Greenbag road. I would much rather see the money used to improve the Kingwood Pike or any other road in Preston County. The roads are in desperate need of attention. All the pot holes are destroying my vehicles and it is NOT safe for me to ride my motorcycle on. To me it is ignorant to use money to build something new if what is there now is working for now. After the roads are ALL fixed then worry about traffic and a roundabout on Greenbag road. The roads should be the 1st priority not a roundabout. A roundabout isn't destroying my car. These deplorable road conditions are unacceptable and should have been fixed a long time ago. I cannot figure out who or why they were allowed to get this bad. Where is all my tax and the lottery money going? Why does my vehicle have to have an annual state inspection if the roads are not fit to drive an off road vehicle on? I'm 35 years old and was born and had lived in Preston County my entire life and have never seen roads like this anywhere but this state. Please fix the roads then worry about other projects.

Comment Number	Comments
241	No roundabouts. I'm from New Jersey originally but have been here for 13 years and no one out here knows how to use them correctly. They just cause more problems. And NJ is doing away with them because they are not safe.
242	Nay!! Keep the integrity of the community and its people!
243	What a waste of money and you continue doing it these roundabouts are stupid and do not work nearly as well as you think they do stop being stupid and wasting my tax dollars
244	I do not support round about at intersection of greenbag road and Kingwood pike. There only needs to be turning lane additions on greenbag road. I have traveled this road for the last 15+ years and coming down the pike or off Dorsey does not cause any problems only crossing traffic on greenbag road. The additional round about would be helpful.
245	This project. Stop.
246	The objective for this plan is okay, but may I suggest a turning lane/turning signal and maybe sidewalks in place of the round about! This plan will take up much valuable space from the farm across the street of Atomic Grill which is needed. As a person who works on the Hastings Farm, I see a lot of potential with the crops we cultivate. Therefore no precious farm land should be taken away for this project. I hope this comment impacts the planning committee for this project. Thank you for you time.
247	I am writing in support of the proposed changes for Greenbag road as currently designed. I live approximately two miles south of the Kingwood Pike/Greenbag road intersection and travel through this intersection a lot. Over the years, I have seen a significant increase in vehicular traffic dating back to when their was a four-way stop signs, then the addition of the current traffic light, which was an improvement. I very much support and look forward having the roundabout installed. Many thanks for helping our communty.
248	Studies have shown that roundabouts are safer than traditional stop sign or signal-controlled intersections. Roundabouts reduced injury crashes by 75 percent at intersections where stop signs or signals were previously used for traffic control, according to a study by the Insurance Institute for Highway Safety (IIHS). Please build as many as you can in Morgantown

Comment Number	Comments
249	I have multiple concerns regarding this project. The impact of the actual construction for those of us who actually live on Greenbag Road will be significant. I understand that the detour will be through Lower Aaron's Creek Road; have any of the engineers or project managers traveled this road? It is in significant disrepair from it's current use and in some areas is unsafe. I am also aware that the plans of the Kingwood Pike roundabout are targeting a farmers field. These plans have a significant impact on natural, historic and agricultural resources. From my understanding, the owners are open to alternative solutions including a turning lane, turning signal, expanding of the road, building sidewalks, or adding signs yet these do not appear to be entertained by the state. This land is: 1. Home to Conscious Harvest Cooperative, a non-profit working to help support low income families with access to local produce. 2. Family-owned and operated farm of 117 years. 3. Community Green Space, including a wild mint and wild mushroom foraging area. 4. Participating WV-permitted industrial hemp research program. 5. Established garlic bed, supplying local families and restaurants. 6. WVU Agronomy/Horticulture Student growing garden. Surely there are many other alternatives to solve the traffic/safety issues at these two intersections. Please explore other alternatives while considering those of us who live, work and play here.
250	Please reconsider placing 2 round abouts on the Greenbag rd. I've lived on the Pike for 16 years and feel the placement of the roundabouts won't improve traffic flow as well as I feel they will be unsafe because of the ability or lack of ability of many drivers in this area.
251	Please don't put a roundabout at the end of the Kingwood Pike. It would be a waste of money. Roundabouts don't work well in Morgantown. If you don't believe it try using the roundabout on the Mileground at 4pm weekdays. Traffic coming off the 705 DOESN'T yield, therefor no one from any other direction can enter. If anything is needed, maybe widen Greenbag Road and put in a turn lane. This will help with the traffic congestion at the end of the day. It would be GREAT if you could repair the Kingwood Pike road itself. The road is in poor condition. Many people are blowing tires from the potholes. Also there are many places that people will cross the center line in order to miss the holes. This is so dangerous. Also the thought of closing the Kingwood Pike and detouring traffic down Aaron's Creek Road or Summer School Road is an awful idea. Aaron's Creek Road really isn't wide enough to accommodate the extra traffic. It is in desperate need of repair too. Also the field that is going to be used for the roundabout provides food to food banks for people in need. There are just so many reason's this isn't a good idea. Please just fix the road we have and don't waste the states money or time putting in something that will just make it worse. Thank you!
252	Kingwood pike needs a green arrow when turning left
253	Stop roundabout!! Traffic is only a problem when school is opening or closing and in evening about 5. Turn lanes would be a better solution. Fixing the Kingwood Pike road would be a start. Obviously the engineer who has worked on it the last 3 or 4 times needs replaced. Arron’s Creek road will never accommodate the traffic as a detour.

Comment Number	Comments
254	I am opposed to the proposed round about on Greenbag road. Taking property from an individual to make this round about is absurd. I think a simple turning lane would be a better alternative and cheaper. We have so many other road issues in WV and you want to spend money on a round about. Absolutely ridiculous.
255	Please consider all environmental impacts on such a project. Please also consider what the current and proposed private land use plans are that this expansion will negatively impact indefinitely for the future ahead. Why change a good thing that already currently exists? A more comprehensive considerate approach for private land owners and tax payers is needed at this time before moving forward. In ranked order of road/traffic improvements that are deemed necessary and important, this project needs to rank towards the bottom of the list. We can do better city wide and start elsewhere with improvements in much higher trafficked areas. Thank you for listening.
256	In favor of roundabout
257	The Intersection at Green Bay Rd. and Kingwood Pike is horrible as it is currently. Around about would be a fabulous idea! I left turn lane would be wonderful as well. Greenbag is becoming a hazard with busses, Mylan traffic and people driving into Morgantown from Preston county.
258	I don't think a roundabout is a good idea but just add turning lanes and light to go from greenbag road to Dorsey ave or kingwood pike
259	I don’t think the round about is going to help any at the four way stop on the Kingwood Pike. It’s hard for those big trucks to make the turn as it is. A turn lane would make better since. An on and off ramp onto Interstate 68 up by the bridge would allow the truck traffic to go that way and a lot of car traffic needs to get on 68 or 79 to get to work. Some in that office must have some common sense somewhere. No one seems to have any.
260	No round about Kingwood Pike or Collinsferry and University Ave
261	Build a turning lane, not a round-about
262	A roundabout is not needed at the intersection of the Kingwood Pike and Greenbag Rd. Turning lanes to allow left turns to keep traffic flowing would be a much better idea in this particular place. The majority of traffic in the area seems to be from people wanting to travel straight through on Greenbag being forced to wait on those wanting to turn left to go up the Pike or down Dorsey who have to wait for the road to be clear to turn. Turning lanes would allow those traveling straight through to do so, while a signal with a left turn arrow would allow others to turn without as much of a wait
263	Please do not include a roundabout in the Greenbag Road Project. A turning lane will be sufficient. The construction of the roundabout could cause potential damage to the local ecosystem.
264	I am writing to comment on the proposed roundabout on Greenbag Road in Monongalia County. I have lived off this road for close to thirty years and travel the route to be effected multiple times daily. I do agree that some changes need to be made at this intersection but I strongly disagree with the roundabout. A less costly and more efficient plan should be considered. Do we the citizens of this state, this county, this town, this neighborhood have no chance for input before this costly decision is made? Please realize that there is a lot of opposition about this proposed project. Please consider additional options.

Table 3: Response to Comments

Comment number	Response to comment
1	The roundabouts have been designed to meet the projected level of service requirements for the design year (2048) and with larger vehicles in mind incorporating truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.
2	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Both build alternatives include widening of Luckey Lane. The east end of Luckey Lane will incorporate two 8-foot travel lanes with curb and gutter on both sides. The west end of Luckey Lane will include a 10-foot travel lane and a 12-foot travel lane with curb and gutter on both sides.
3	The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). During data collection of existing traffic volumes by doing turning movement counts, typical vehicles (passenger cars), heavy vehicles (trucks), buses, bicycles and pedestrian at crosswalk locations were counted and included in the proposed traffic models and analysis..
4	The City of Morgantown will be responsible for the maintenance of the sidewalks that are proposed to be constructed within the city limits; the WVDOH will be responsible for the maintenance of the sidewalks that are proposed outside the city limits. Both build alternatives include widening of Luckey Lane. The east end of Luckey Lane will incorporate two 8-foot travel lanes with curb and gutter on both sides. The west end of Luckey Lane will include a 10-foot travel lane and a 12-foot travel lane with curb and gutter on both sides. As part of the EA development, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Impacts to the community garden have been minimized to the extent practicable. The EA will be available on the WVDOH website at go.wv.gov/dotcomment.
5	We appreciate your input and support regarding the project.
6	The roadway alternatives were designed to provide safe pedestrian access from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. All roadway crossings will be marked and signed as crosswalks. The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives. Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
7	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. Projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. The design for Luckey Lane does not take any of the residences or the church and access will be maintained to each during construction through the use of flagging.
8	The WVDOH performed a traffic study for the project corridor and have analyzed and evaluated the traffic at the Luckey Lane intersection near Dollar General, including the option of terminating Luckey Lane prior to the intersection with Greenbag Road. Changes to the Luckey Lane intersection with Greenbag Road are outside the scope of the current project but will be considered during additional phases of work on Greenbag Road. Greenbag Road is currently designated as 40 mph and school zone designation was not included within the traffic study for this project. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection.

Comment number	Response to comment
9	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
10	Right-of-way acquisition cannot begin until all approvals for the project have been secured and final design has been completed. WVDOH right-of-way staff and design engineers will work with the property owners regarding the acquisition of property. The purchase of private property will follow all relevant federal and state property acquisition laws, policies, and procedures.
11	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
12	Community involvement in the development of the MMMPO Corridor study report identified the lack of pedestrian facilities connecting the neighborhood schools with the commercial and residential areas as a key issue for community safety and access. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
13	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
14	A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
15	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. The environmental document for the project has been elevated from a CE to an EA. Per FHWA guidelines, the EA is a concise document that provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. FHWA determined that based on the comments received during the first public comment period, an EA should be prepared. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
16	Comment noted.
17	Apollo Drive is, as you noted, a private road and it is outside of the scope of the current project. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Emergency vehicle access will be maintained during all phases of construction and coordination will occur with the fire department for each phase.
18	A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers by not requiring all vehicles to come to a complete stop.
19	Right-of-way acquisition cannot begin until all approvals for the project have been secured and final design has been completed. WVDOH right-of-way staff and design engineers will work with the property owners regarding the acquisition of property. The purchase of private property will follow all relevant federal and state property acquisition laws, policies, and procedures. Right-of-way agents will work to obtain correct records once the acquisition process begins.

Comment number	Response to comment
20	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. All roadway crossings will be marked and signed as crosswalks. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
21	FHWA has evaluated the project and determined that an EA is the appropriate level of documentation given the scope and details of the project. The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. These alternatives and options are assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. Each of the alternatives and options has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
22	A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Based on studies by the FHWA, changing a signalized intersection to a roundabout showed a 48% reduction in all crashes and a 78% reduction in fatal/injury crashes. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers by not requiring all vehicles to come to a complete stop. Pedestrians and bicyclists have less risk with roundabouts than traditional signalized intersections due to the lower vehicle speeds through the roundabout and shorter travel distances for the pedestrians crossing the roadway. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road.

Comment number	Response to comment
23	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
24	The environmental document for the project has been elevated from a CE to an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. When construction is completed and all disturbed areas have been re-vegetated, Greenbag Road will still be a rural area with a transportation corridor. The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.
25	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). During the right-of-way acquisition process and negotiation, concerns related to the driveway access, billboards, and maintenance of access will be addressed with the right-of-way agent. The sidewalk is along the north side of Greenbag Road and will not be extended along Kingwood Pike.

Comment number	Response to comment
26	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the ROW acquisition process. Impacts to the community garden have been minimized to the extent practicable.
27	Based on studies by the FHWA, changing a signalized intersection to a roundabout showed a 48% reduction in all crashes and a 78% reduction in fatal/injury crashes. Pedestrians and bicyclists have less risk with roundabouts than traditional signalized intersections due to the lower vehicle speeds through the roundabout and shorter travel distances for the pedestrians crossing the roadway. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion.
28	Comment noted.
29	Comment noted.
30	We appreciate your input regarding the project.
31	The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH examined two build alternatives and three options for each of the major intersections. The intersection options will include turning lanes, traffic signals, and roundabouts. These alternatives and options will be assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
32	Right-of-way acquisition cannot begin until all approvals for the project have been secured and final design has been completed. WVDOH right-of-way staff and design engineers will work with the property owners regarding the acquisition of property. The purchase of private property will follow all relevant federal and state property acquisition laws, policies, and procedures. Right-of-way agents will work to obtain correct records once the acquisition process begins.

Comment number	Response to comment
33	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
34	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The EA will be available on the WVDOH website at go.wv.gov/dotcomment.
35	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

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36	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers by not requiring all vehicles to come to a complete stop as is required by a 4-way stop.
37	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
38	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
39	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
40	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection.
41	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

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42	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
43	The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH examined two build alternatives and three options for each of the major intersections. These alternatives and options will be assessed for impacts to social, cultural, natural, economic, and environmental resource factors. Each of the alternatives and options has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor.
44	A traffic study was completed in 2018 to determine the current conditions and provide data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries.
45	Minimizing impacts to the environment, community, and right-of-way were considered when evaluating the project alternatives. The EA analysis included evaluation of impacts to social, cultural, natural, economic, and environmental resource factors, land use, indirect, and cumulative effects.

Comment number	Response to comment
46	The EA analysis examined the potential effects to farmland and agricultural soils within the project area. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion.
47	The environmental document for the project has been elevated from a CE to an EA. Per FHWA guidelines, the EA is a concise document that provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. FHWA determined that based on the comments received during the first public comment period, an EA should be prepared. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. The EA analysis examined the potential effects to farmland and agricultural soils within the project area, as well as social, cultural, natural, economic, and environmental resource factors, land use, indirect and cumulative effects. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
48	The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects.
49	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
50	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

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51	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects.
52	The environmental document for the project has been elevated from a CE to an EA. There will be another public meeting to present the EA and allow additional time for comment. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Any right-of-way required for the project construction will be purchased from the landowner during the right-of-way acquisition process.
53	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Drainage issues will be addressed within the project area. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.

Comment number	Response to comment
54	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
55	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
56	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
57	Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
58	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
59	Both the Morgantown Monongalia MPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways, a reduction in delays for drivers, and improved safety conditions for drivers, pedestrians, and cyclists. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
60	A traffic study was completed in 2018 to determine the current conditions and provide data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries.
61	Both the Morgantown Monongalia MPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways, a reduction in delays for drivers, and improved safety conditions for drivers, pedestrians, and cyclists. The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed in the EA include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
62	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The Sabraton area is outside the scope of the current project.

Comment number	Response to comment
63	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
64	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. When construction is completed and all disturbed areas have been re-vegetated, Greenbag Road will still be a rural area with a transportation corridor. The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.
65	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.

Comment number	Response to comment
66	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
67	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
68	We appreciate your input and support regarding the project.
69	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
70	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Impacts to Cobun Creek have been documented in the EA and mitigation measures will be implemented. The business at Dorsey Avenue will temporarily be impacted during construction sequencing but access will be maintained throughout construction.

Comment number	Response to comment
71	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. To address the issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
72	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
73	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.

Comment number	Response to comment
74	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
75	As part of the EA, the WVDOH examined two build alternatives and three options for each of the major intersections. The intersection options will include turning lanes, traffic signals, and roundabouts. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
76	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
77	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
78	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
79	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

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80	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
81	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
82	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
83	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
84	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

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85	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
86	We appreciate your input and support regarding the project.
87	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
88	The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. As part of the EA, the WVDOH examined two build alternatives and three options for each of the major intersections. The intersection options will include turning lanes, traffic signals, and roundabouts. These alternatives and options will be assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. Each of the alternatives and options has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor. The EA will be available on the WVDOH website at go.wv.gov/dotcomment.
89	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
90	Right-of-way impacts as well as impacts to the community garden have been minimized to the extent practicable.
91	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
92	Both the Morgantown Monongalia MPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.

Comment number	Response to comment
93	Property owners will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Both the Morgantown Monongalia MPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
94	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
95	As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO’s preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. Impacts to the surrounding properties, both residential and commercial, have been minimized to the extent practicable.
96	This comment is beyond the scope of the current project.

Comment number	Response to comment
97	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
98	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
99	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
100	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
101	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
102	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
103	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
104	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates.
105	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
106	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Drainage issues within the project footprint will be considered by the project design. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Access to residences and businesses will be maintained during and after construction.

Comment number	Response to comment
107	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
108	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
109	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
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111	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
112	The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.

Comment number	Response to comment
113	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor.
114	The environmental document for the project has been elevated from a CE to an EA. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
115	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
116	Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
117	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
118	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The evaluation and analysis of the intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

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119	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
120	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
121	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
122	The intersection of Greenbag Road and Route 7 is outside the current phase of work for the Greenbag Road corridor.

Comment number	Response to comment
123	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences.
124	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.
125	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
126	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
127	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The roadway alternatives were designed to provide safe pedestrian access from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. All roadway crossings will be marked and signed as crosswalks.
128	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). All property owners will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
129	The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. These alternatives and options were assessed for impacts to social, cultural, natural, economic, environmental, indirect, and cumulative resource factors. Each of the alternatives and options has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor. The preferred alternative was selected, in part, because it does not result in the take of any residential homes. The EA details the impacts to each of the studied categories and will be available on the WVDOH website at go.wv.gov/dotcomment.

Comment number	Response to comment
130	As part of the EA, the WVDOH examined two build alternatives and three options for each of the major intersections. The intersection options will include turning lanes, traffic signals, and roundabouts. These alternatives and options will be assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. The evaluation and analysis of the intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.
131	The environmental document for the project has been elevated from a CE to an EA. Per FHWA guidelines, the EA is a concise document that provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact. FHWA determined that based on the comments received during the first public comment period, an EA should be prepared. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. The EA analysis examined the potential effects to farmland and agricultural soils within the project area, as well as social, cultural, natural, economic, and environmental resource factors, land use, indirect and cumulative effects. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
132	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
133	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
134	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO corridor study in 2015 was a preliminary study and the recommendations are included as options considered in the EA. The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
135	A traffic study including manual turning movement counts and automatic traffic recorder counts was completed in 2018 showing that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
136	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
137	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
138	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
139	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. These options are assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
140	We appreciate your input and support regarding the project.

Comment number	Response to comment
141	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Impacts to the surrounding land have been minimized to the extent practicable.
142	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
143	We appreciate your input and support regarding the project.
144	Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
145	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
146	Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
147	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
148	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
149	We appreciate your input and support regarding the project.
150	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
151	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
152	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
153	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). School bus traffic will be considered during the final design stage when the detour and maintenance of traffic plan are finalized.
154	The land proposed to be used for this project belongs to a mixture of private landowners, commercial businesses, and the WVDOH (for the existing right-of-way). The land will be acquired for the project during the right-of-way acquisition process after the EA is finalized. The land will not be taken from landowners but purchased through a negotiation process. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road.
155	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Impacts to the community garden have been minimized to the extent practicable.
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158	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.

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160	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

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161	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. The roadway alternatives were designed to provide safe pedestrian access from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. All roadway crossings will be marked and signed as crosswalks.
162	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates. Details of the impacts analysis for each of the categories can be found in the EA which will be available on the WVDOH website at go.wv.gov/dotcomment.
163	The environmental document for the project has been elevated from a CE to an EA. There will be another public meeting to present the EA and allow additional time for comment. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.

Comment number	Response to comment
164	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
165	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
166	We appreciate your input regarding the project.
167	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
168	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
169	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.
170	A 4-way stop was not considered at any study intersection within the Greenbag Road corridor. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
171	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses and trucks.
172	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The entrance/exit ramps for I-68 are beyond the scope of the current project.

Comment number	Response to comment
173	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. These alternatives and options are assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. Each of the alternatives and options has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.
174	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.
175	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
176	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
177	We appreciate your input and support regarding the project.
178	Impacts to the community garden have been minimized to the extent practicable.
179	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Impacts to the community garden have been minimized to the extent practicable.
180	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The current project includes the widening of both travel lanes on Greenbag Road along with the inclusion of shoulders at the edge of the roadway. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
181	We appreciate your input and support regarding the project.
182	Renderings for the roundabouts will be provided in the second public meeting and available online at the WVDOH website at go.wv.gov/dotcomment.
183	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
184	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.
185	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses and trucks. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
186	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
187	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
188	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.

Comment number	Response to comment
189	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
190	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
191	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
192	The evaluation and analysis of the intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The turn lane options at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Impacts to the surrounding land have been minimized to the extent possible.
193	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
194	Feedback has been solicited during the project development process at the April 2019 public meeting and further feedback will be solicited during the 2020 virtual public meeting. Both the MMMPO corridor study (which included additional opportunities for public comment) and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
195	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates.
196	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
197	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
198	A public meeting was held on April 16, 2019. Based on the comments received the project environmental documentation has been elevated from a CE to an EA. There will be another public meeting to present the EA and allow additional time for comment. The EA will be available on the WVDOH website at go.wv.gov/dotcomment.
199	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Impacts to the community garden have been minimized to the extent practicable.
200	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses.
201	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight of larger vehicles, including trucks and school buses. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option provides the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
202	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates.
203	This comment is beyond the scope of the current project.
204	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight of larger vehicles, including trucks and school buses. Based on studies by the FHWA, changing a signalized intersection to a roundabout showed a 48% reduction in all crashes and a 78% reduction in fatal/injury crashes. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. The traffic study completed in 2018 considered the effect that school traffic has on the corridor.
205	The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered. The roundabouts will be designed and installed to meet both Federal and State guidelines and signage will be placed to assist drivers with navigating the roundabout.
206	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.
207	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The dedicated bike lane remains on the westbound direction of traffic. A 2-foot shoulder will accompany the eastbound travel lanes. Impacts to the community garden have been minimized to the extent practicable.
208	The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.
209	The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.

Comment number	Response to comment
210	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
211	The environmental document for the project has been elevated from a CE to an EA. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
212	All public involvement and comments have been noted by the WVDOH, and all documentation is part of the public record for the project, and become part of the final environmental document.
213	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Impacts to the community garden have been minimized to the extent practicable.
214	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

Comment number	Response to comment
215	Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Based on studies by the FHWA, changing a signalized intersection to a roundabout showed a 48% reduction in all crashes and a 78% reduction in fatal/injury crashes. Pedestrians and bicyclists have less risk with roundabouts than traditional signalized intersections due to the lower vehicle speeds through the roundabout and shorter travel distances for the pedestrians crossing the roadway. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
216	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
217	The environmental document for the project has been elevated from a CE to an EA. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. These alternatives and options are assessed in the EA for impacts to social, cultural, natural, economic, and environmental resource factors. A detailed study of the socioeconomic impacts is included in the EA as part of the Environmental Justice section. There will be temporary impacts to businesses during construction but there will not be any businesses displaced by the project.
218	Roundabouts are designed to maintain a constant flow of traffic through the intersection, resulting in fewer complete stops. A turn lane option has been considered in the EA. The analysis factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
219	Thank you for enumerating these safety concerns. The WVDOH will examine all safety concerns as part of the final design.
220	Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The roundabouts designs meet the DOH and FHWA safety standards.
221	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
222	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
223	A traffic study was completed in 2018 to determine the current conditions and provide data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
224	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
225	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
226	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet).
227	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
228	Impacts to the community garden have been minimized to the extent practicable.

Comment number	Response to comment
229	Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Roundabouts are also designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
230	The WVDOH is examining two build alternatives and three options for each of the major intersections. The intersection options will include turning lanes, traffic signals, and roundabouts. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
231	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
232	The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
233	We appreciate your input and support regarding the project.
234	The environmental document for the project has been elevated from a CE to an EA. Each of the alternatives and options considered in the EA has been designed to meet the purpose and need for the project to reduce congestion and address the lack of safe non-motorized connections along the CR 857 corridor. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
235	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. All comments and letters received by the WVDOH have been included in this response table and considered.

Comment number	Response to comment
236	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The entrance/exit ramp for I-68 and the issues on Route 7 are beyond the scope of this project.
237	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
238	Impacts to the community garden have been minimized to the extent practicable.
239	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
240	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
241	Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion.
242	We appreciate your input regarding the project.
243	As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates. Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion.
244	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
245	We appreciate your input regarding the project.

Comment number	Response to comment
246	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
247	We appreciate your input and support regarding the project.
248	We appreciate your input and support regarding the project.
249	The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process taking into account the state of the roads proposed and impacts to the traveling public. Construction sequencing has not yet been defined to determine the length of temporary construction impacts. The roundabout design does not target the field. Each of the designs for the intersection improvements has factored the topography, safety issues, constructability, and current land use to develop feasible options. In the development of the EA, the WVDOH examined two build alternatives for the project and three options for intersection improvements at each of the intersections. These options include turning lanes and traffic signals, and roundabouts. The community garden is located on private property and the property owner will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the community garden have been minimized to the extent practicable.
250	The traffic study and analysis of the 3 options designed for each of the intersections shows that the use of roundabouts at the Dorsey Avenue/Kingwood Pike and Mississippi Street intersections will improve the flow of traffic along Greenbag Road. Education on the use of roundabouts is an important issue in order to have full functionality of the roundabout that results in fewer severe crashes, fewer crashes overall, shorter travel times, and less congestion.
251	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The detour presented in the April 2019 meeting was preliminary and the final detour route will be examined and defined during the final design process. Existing road conditions will be considered as a factor when determining the detour routes.
252	The alternatives and intersection options determined to be evaluated were based on the outcome of the MMMPO's preliminary studies and findings. Changes to the existing traffic signal, without other improvements, were not considered.

Comment number	Response to comment
253	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
254	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
255	The WVDOH has prepared an EA to consider the potential environmental consequences of the project, document the analysis, and make this information available to the public for comment prior to implementation. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
256	We appreciate your input and support regarding the project.
257	We appreciate your input and support regarding the project.
258	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
259	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The proposed interchange at I-68 is beyond the scope of this project.

Comment number	Response to comment
260	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address these issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also evaluates the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
261	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
262	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
263	A turn lane option has been considered in the EA and evaluated for impacts to social, cultural, natural, economic, and environmental resource factors. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicated conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes involve complete takes of 2 or 3 residences (depending on the turn lane option selected).

Comment number	Response to comment
264	The environmental document for the project has been elevated from a CE to an EA. There will be another public meeting to present the EA and allow additional time for comment. The EA will be available on the WVDOH website at go.wv.gov/dotcomment. As part of the EA, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates.

UPCOMING PUBLIC MEETING

TUESDAY, APRIL 16, 2019
4:00 PM TO 7:00 PM
SOUTH MIDDLE SCHOOL
500 EAST PARKWAY DRIVE, MORGANTOWN, WV

GREENBAG ROAD IMPROVEMENT PROJECT

State Project U331-857-0.67, Federal Project NFA-2317(022)D
Monongalia County, WV

Join us on Tuesday, April 16, from 4:00 to 7:00 PM at the South Middle School in Morgantown, WV at an Informational Workshop Public Meeting to learn more about the Greenbag Road Improvement Project. Representatives from the West Virginia Division of Highways (WVDOH) and Federal Highway Administration will be available to discuss the proposed project and answer questions. No formal presentation is planned; however, project information will be provided for review. This meeting complies with the public involvement requirements of the National Environmental Policy Act and Section 106 of the National Historic Preservation Act.

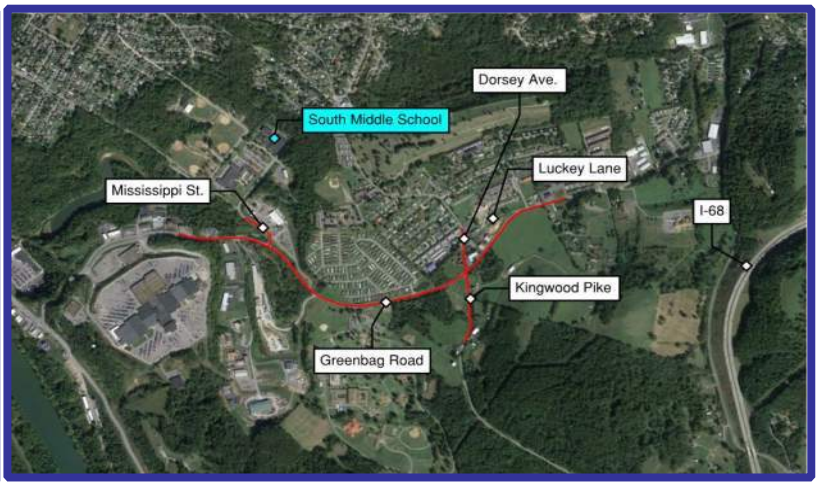
Project Summary:

This project proposes to make improvements to Greenbag Road including shoulder and lane widening, the addition of a sidewalk along the west side of the road, and intersection improvements. Both the Mississippi Street and Dorsey Avenue/Kingwood Pike intersections with Greenbag Road are planned to become roundabouts. The box culvert carrying Greenbag Road over Cobun Creek will be widened to accommodate the wider roadway. On Luckey Lane, the project will improve the width of the travel lane and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. During construction, traffic will be maintained via detour on existing roads and/or temporary traffic signals or flaggers. WVDOH welcomes your input on potential environmental concerns, including, among other issues, impacts to natural and cultural resources as well as social and economic impacts.

Comments are due by Thursday, May 16, 2019 and can be submitted at the meeting or sent to:

Mr. RJ Scites, P.E.
Director, Engineering Division
WVDOH
1334 Smith Street
Charleston, WV 25301

Comments can also be submitted via our website at: http://go.wv.gov/dotcomment



The West Virginia Department of Transportation will, upon request, provide reasonable accommodations including auxiliary aids and services necessary to afford an individual with a disability an equal opportunity to participate in our services, programs and activities. Please contact us at (304) 558-3931. Persons with hearing or speech impairments can reach all state agencies by calling (800) 982-8722 (voice to TTD), or (800) 982-8771 (TDD to voice), toll free.

DATE:

Mr. RJ Scites, P.E.
Director, Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25301

DATE: **Tuesday, April 16, 2019**
LOCATION: **South Middle School**
SUBJECT: **Public Meeting**
PROJECT: **Greenbag Road Improvement Project**
State Project: U331-857-0.67
Monongalia County

COMMENTS DUE BY: **Thursday, May 16, 2019**

Please consider the following comments:

(Please print the following information)

NAME:

ADDRESS:

ORGANIZATION (IF ANY):

How did you hear about today's meeting?

Project Information and Comment Sheets can also be found at http://go.wv.gov/dotcomment under Engineering Projects, open and click Greenbag Road Improvement Project.

PLEASE PRINT

NAME	ADDRESS or EMAIL
Kathy Dalton	Clinton Hotel – 703 Greenbag Rd. Mgtn.
Ann Talerico	388 Kingwood Pike, Mgtn
Mariah Martin	25 Dorsey Ln. Motown 26501
David Dorris	DDM1M2@aol.com
Kevin Summers	800 Green Bag Rd
Lou Scotchel	1384 Greenbag Rd Mgtown WV
Ann Eveily	107 Apolla Dr. Mgtn.
Barbara Parsons	233 Park St Morgantown, WV 26501
Shawn Myer	205 Prager Pl Mgnt WV 26508
Alyssa Liston	issamarie2@hotmail.com
Delegate Danielle Walker	26 Addison Circle Morgantown, WV 26505
LARRY ZINN	
Marc Glass	911 Greenbag Road, Morgantown WV 26508
David Weaver	619 West Virginia Ave, Morgantown, WV 26501
John Whitmore	Jwhitmore@morgantown.wv.gov
Rachel Fetty	rfetty@morgantownwv.gov

PLEASE PRINT

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Richard Wood	MCPC
Raymond & Frances	693 GREENBAG ROAD
GARY Hebden	5 BLUEGRASS VILLAGE
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Mitch & Spengler	686 Lower Aarons Creek Rd. Morg, WV 26508
Karen Spengler	"
Greg Spicer	809 Greenbag Rd
Paula Herbst	746 GR
Vinnie Roman	Atomic Grill
BILL & CAROL SUMMERS	1015 GLEN OAKS DR.
Shirley Hess	504 Parkway Dr.

PLEASE PRINT

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Doreen McElhaney	1303 MOUNTAIN VIEW MANOR Morgantown
Agnes Wajeeduddi	1029 Jonathan Ln Morgantown

PLEASE PRINT

NAME	ADDRESS or EMAIL
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[illegible] Fenili	308 S. Hall ST / GREEN BAG RD
Garrett Richards	27 Kingwood Pike Morgantown WV 26508
Sam Richards	253 COBUN VALLEY LANE, MORGANTOWN, WV 26508
[illegible]	819-820-821-822-823 Greenbag Rd Mtg W. 26508
dewey hastings / Email See MARY	81 Route 81 old Kingwood Pike Mgtn WV 26505
Jenny Selin	1224 Fairlawns Morgantown, WV 26505
STACIA DAVIS	529 Madison Ave

GREENBAG ROAD IMPROVEMENT PROJECT

State Project U331-857-0.67
Federal Project NFA-2317 (022) D
Monongalia County, West Virginia

PUBLIC MEETING

Tuesday, April 16, 2019

WELCOME!

Thank you for participating in the public informational workshop for the Greenbag Road Improvement Project in Morgantown, WV. This meeting is being hosted by the West Virginia Division of Highways (WVDOH) to present the preliminary designs for the project and to collect public opinion and comments on the plans. We invite you to browse the displays and encourage discussions with the project team. There will be **no formal presentation** during the meeting. There is a comment sheet available on the final page of this handout. Please submit your comments at the meeting, by mail, or via the WVDOH website at http://go.wv.gov/dotcomment.

This meeting complies with the public involvement requirements of the National Environmental Policy Act and Section 106 of the National Historic Preservation Act.

PROJECT BACKGROUND AND PURPOSE

The project is based on a study by the Morgantown Monongalia MPO (MMMPO) Unified Working Program (FY2014-2015). The overall goal of the study was to identify ways to improve Greenbag Road (CR 857) as an alternative truck route to reduce and/or eliminate trucks from traveling through downtown Morgantown by providing a safer, continuous route from WV 7 to US 119. The study reviewed the roadway from the intersection with WV 7 to the intersection with US 119. Recommendations from the study included roadway improvements, intersection improvements, multi-modal improvements, and on-going monitory of safety and development. Specific proposed projects were to widen and resurface Greenbag Road and provide shoulders along both sides; adding turn lanes and optimizing signals at the Dorsey Ave/Greenbag Road intersection and the US119/Greenbag Road intersection; and provide a sidewalk along the north side of Greenbag Road to increase pedestrian safety.

The current project will improve and upgrade the Dorsey Ave/Greenbag Road intersection, widen and resurface Greenbag Road from just west of Mississippi Street to Jonathan Lane, and provide a sidewalk and shoulders along Greenbag Road, as identified in the MMMPO study. These improvements will address several of the major issues identified in the study including: inadequate turning radius and intersection delays at Dorsey Ave/Greenbag Road; limited sight distance at Mississippi Street/Greenbag Road; and the lack of safe non-motorized facilities connecting the neighborhoods along the corridor.

PROJECT DESCRIPTION



The current project extends from ¼ mile west of the Mississippi Street intersection along Greenbag Road (CR 857) to the intersection with Jonathan Lane, approximately 1/10 mile east of Luckey Lane and includes intersection improvements at Mississippi Street (CR 857/1) and at Dorsey Avenue/Kingwood Pike (CR 81). These intersection improvements will increase the overall traffic capacity of Greenbag Road (CR 857) between WV 7 and US 119.

The overall roadway improvements include wider lanes and shoulders along with a dedicated center turn lane prior to the Mississippi Avenue intersection. A curb and gutter will be installed along the west side of Greenbag Road to help address drainage issues and to provide a sidewalk along the entire route to the Dorsey Avenue/Kingwood Pike intersection. In addition, the west side shoulder will be utilized as a shared bike lane for the corridor between the commercial district and the residential areas. The sidewalks and crosswalks will provide a safer route for pedestrian traffic from the current commercial area to the numerous residential areas located along Greenbag Road.

The two major intersections will be reconstructed as a single lane roundabouts to provide for continuous traffic flow and to increase the safety of the traveling public as they enter each intersection. The roundabouts have been selected instead of signalized intersections based on traffic analysis and level of service. The roundabouts will also be developed to allow the safe movement of pedestrians along the sidewalk on the west side of Greenbag Road and will include lighting on each approach to the roundabout.

The roadway improvements incorporate two 11-foot travel lanes with a 12-foot center turn lane with curb and gutter on each side up to Mississippi Street. Between Mississippi Street and Dorsey Avenue/Kingwood Pike, the roadway will be improved to two 12-foot travel lanes and a 4-foot paved east shoulder. A 3-foot paved shoulder with a curb and gutter will be on the west side. The 5-foot concrete sidewalk will be located along the entire corridor on the west side of Greenbag Road (CR 857).

Maintenance of Traffic during Construction

Traffic patterns will be temporarily impacted. A maintenance of traffic (MOT) plan will be in place to minimize delays, maintain access to residences and businesses, and maintain safety for travelers and construction workers. The proposed MOT plan will include either the use of a detour on existing roads or temporary signals or flaggers.

The Mississippi Street roundabout will be constructed adjacent to Greenbag Road. When the northern portion of the roundabout is complete, traffic will shift to the newly created approaches and through the constructed portion of the roundabout while the southern portion is constructed. Mississippi Street will remain open to traffic throughout the construction of the roundabout.

For the roundabout at Greenbag Road and Dorsey Ave/Kingwood Pike, construction will be completed in multiple stages to allow for continued access. The **proposed stages** are:

Stage 1 will widen the existing Greenbag Road between the entrance to Bluegrass Village and the intersection at CR 81 (Dorsey Ave/Kingwood Pike). The widening will take place on the north side of Greenbag Road. When complete, westbound traffic will shift onto the newly constructed roadway and eastbound traffic will utilize the existing westbound lanes.

Stage 2 will close Kingwood Pike and construct the southern approach and half of the east/west approaches to the roundabout. This will include the construction of the proposed retaining wall on the eastern approach.

Stage 3 will shift traffic to the newly created east/west approaches and through the constructed portion of the roundabout, then re-open Kingwood Pike. Dorsey Avenue will be closed and traffic will utilize Luckey Lane using temporary lights at both the Luckey Lane/Greenbag Road intersection and at Kingwood Pike and the re-aligned Greenbag Road.

Stage 4 will construct the north approach and the remaining east/west approach legs.

Stage 5 will open to traffic and install the islands while under traffic.

During Stage 2 when Kingwood Pike is closed, two detours will be posted. The **car detour** is 3.2 miles in length and requires approximately 10 minutes. When traveling north on Kingwood Pike (CR 81), turn right onto Aarons Creek Road (CR 70). Make a left turn onto Lower Aarons Creek Road (CR 64/1). Turn left onto Greenbag Road (CR 857) and continue until the Dorsey Ave/Kingwood Pike intersection. The same detour will exist for southbound traffic with directions reversed.

The **truck detour** is 10.6 miles and requires approximately 25 minutes. When traveling north on Kingwood Pike (CR 81), turn right onto Summers School Road (CR 72). Continue on Summers School Road (CR 72) when it becomes CR 70/1. Continue right on Summers School Road where it joins with CR 70 (Aarons Creek Road) and bear left onto 70/3 when CR 70 splits to the right. Turn left onto Earl Core Road (WV 7) and continue into Sabraton. Make a left turn onto Greenbag Road (CR 857) and continue until the Dorsey Ave/Kingwood Pike intersection. The same detour will exist for southbound traffic with directions reversed.

PROJECT IMPACTS AND SCHEDULE

Acquisition of new right-of-way for the project includes a total of 8.9 acres from 24 properties. Utilities will be relocated to eliminate conflicts with the proposed roadway upgrade and close coordination with the utility companies will be necessary to ensure service will not be disrupted.

PROJECT SCHEDULE

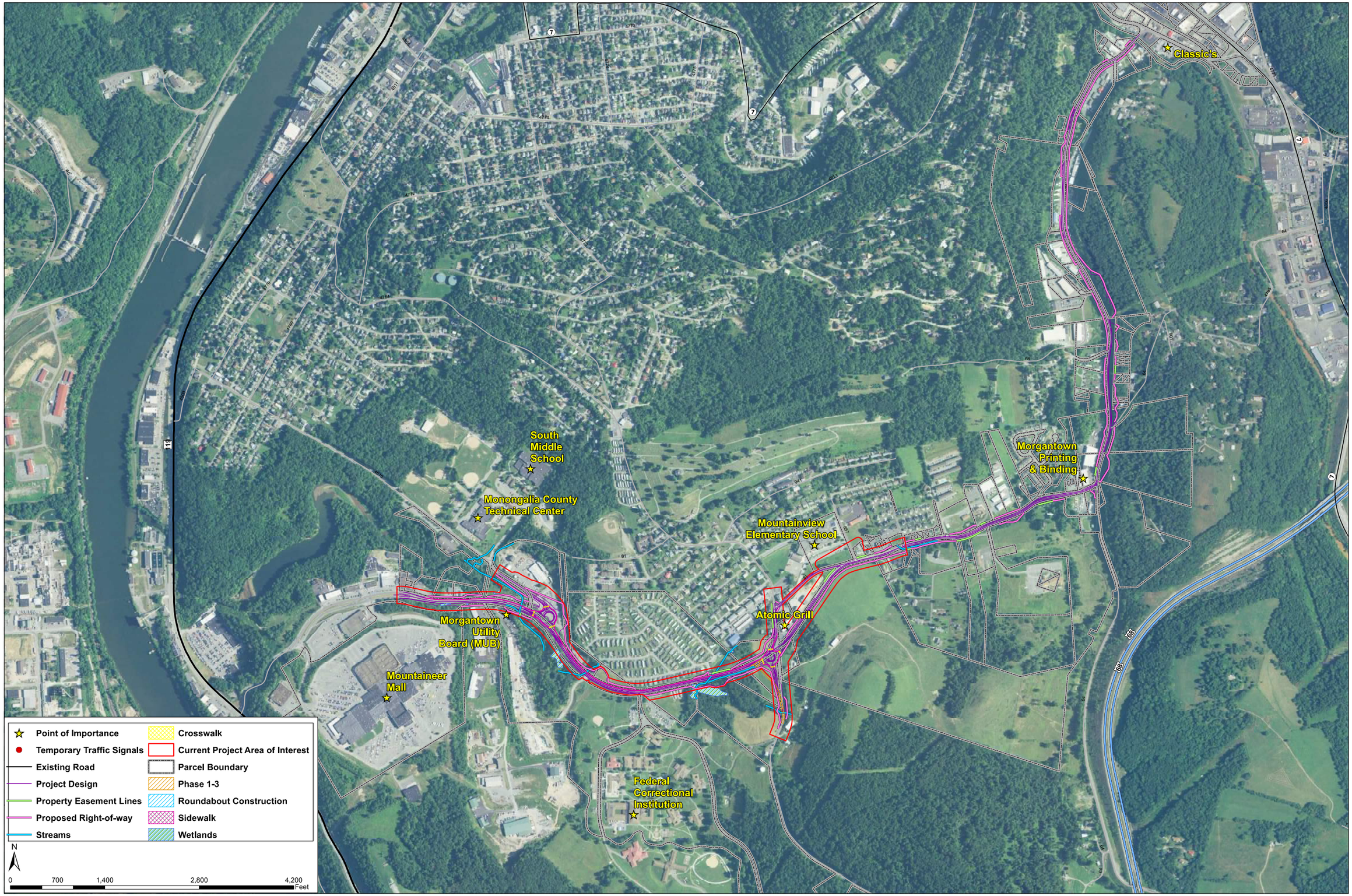
April 16, 2019	Public Meeting
May 16, 2019	Public comments due to the WVDOH
July 1, 2019	Environmental Clearance
Fall 2019	Project Letting
Spring 2020	Right-of-Way Acquired
Summer 2020	Construction Begins

Comments are due May 16, 2019 and should be sent to the following:
Mr. RJ Scites, P.E., Director Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25301
Or electronically at http://go.wv.gov/dotcomment

GREENBAG PUBLIC MEETING - 04/16/2019

MORGANTOWN/MONONGALIA PLANNING STUDY AREA

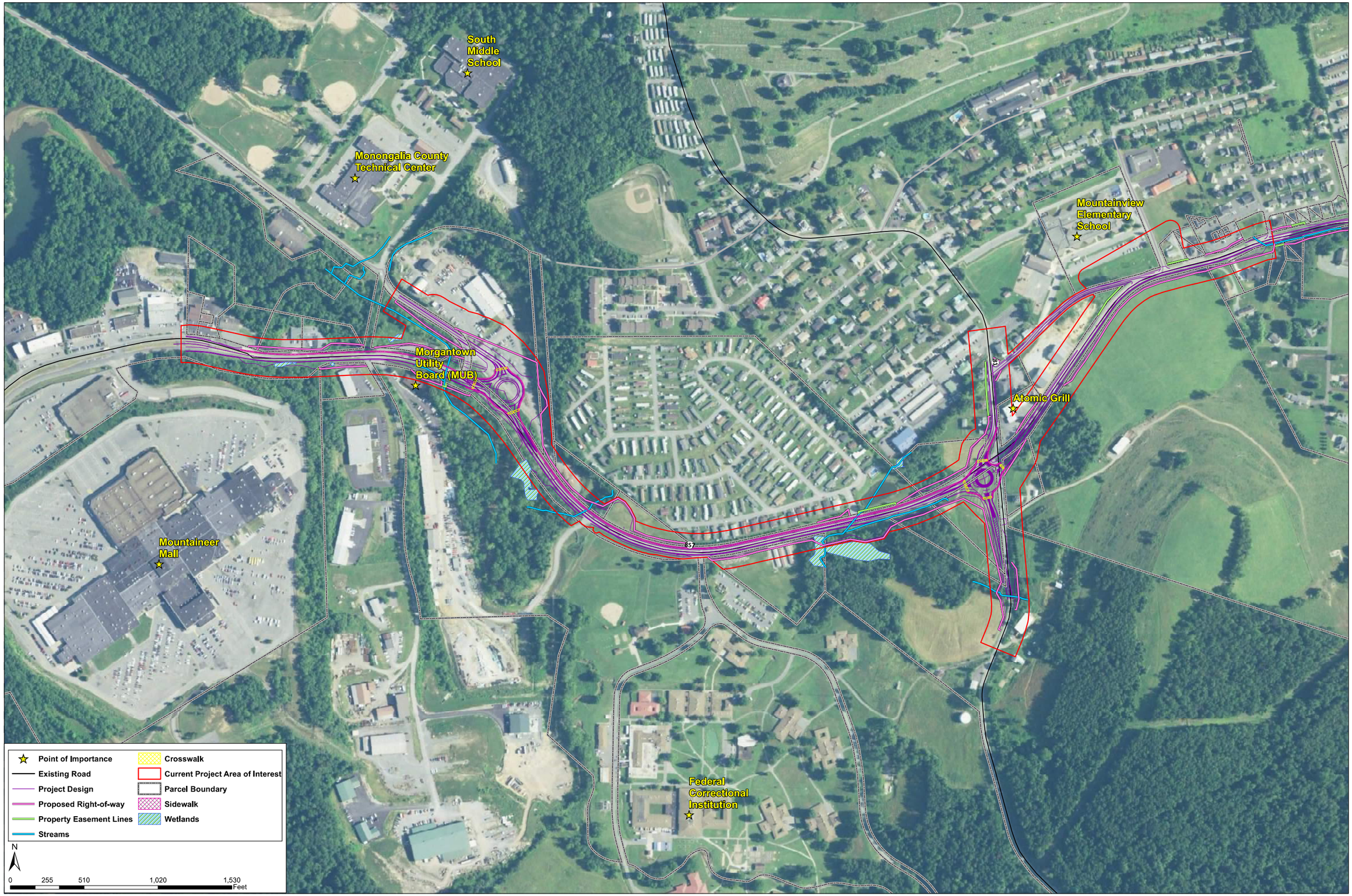
GREENBAG ROAD (COUNTY ROAD 857)



GREENBAG PUBLIC MEETING - 04/16/2019

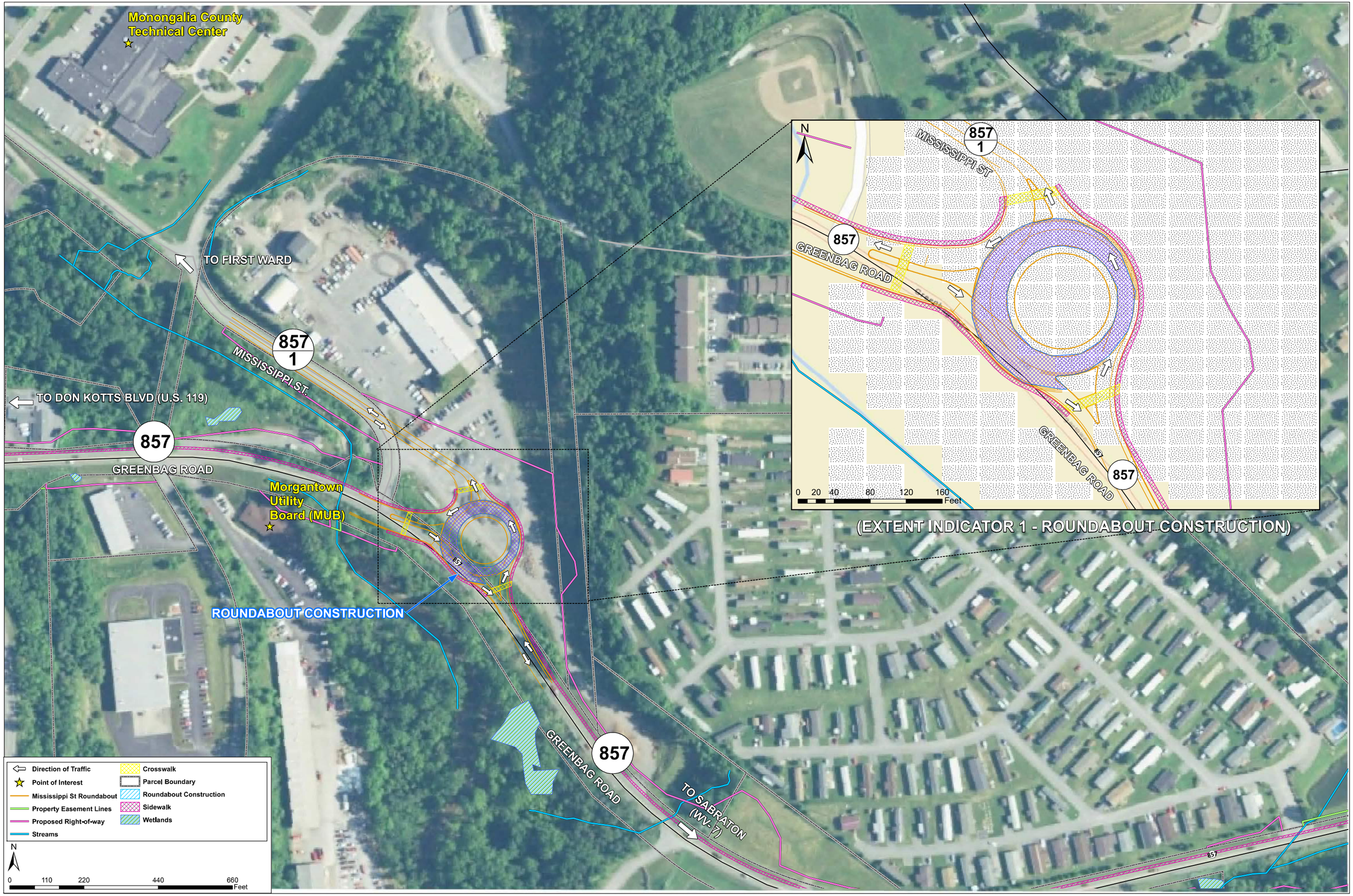
GREEN BAG ROAD PROJECT OVERVIEW

GREENBAG ROAD IMPROVEMENT PROJECT



GREENBAG PUBLIC MEETING - 04/16/2019

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND MISSISSIPPI ST



GREENBAG PUBLIC MEETING - 04/16/2019

STAGES 1-3

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)

81

DORSEY AVE TO FIRST WARD, HOPECREST, SOUTH PARK

DORSEY AVE

TO SABRATON WEST VIRGINIA 7

857

GREENBAG ROAD

Atomic Grill

SHORT-TERM WORK

TEMPORARY WIDENING

PAVEMENT REMOVAL

TO DON KOTTS BLVD (U.S. 119)

857

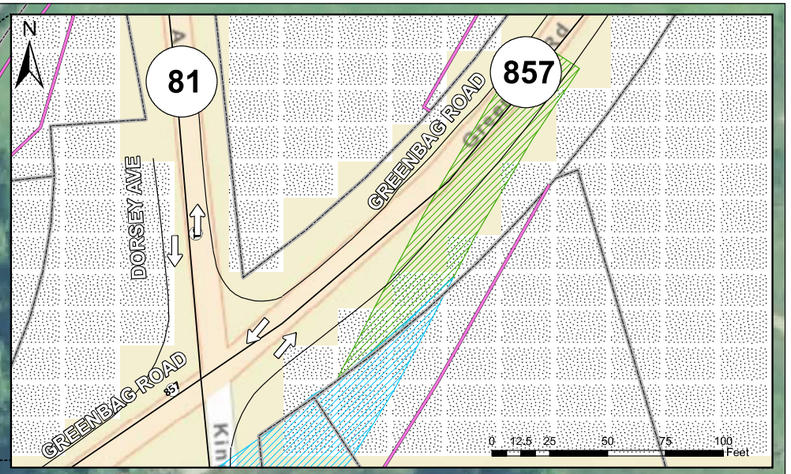
GREENBAG ROAD

ROUNDABOUT CONSTRUCTION

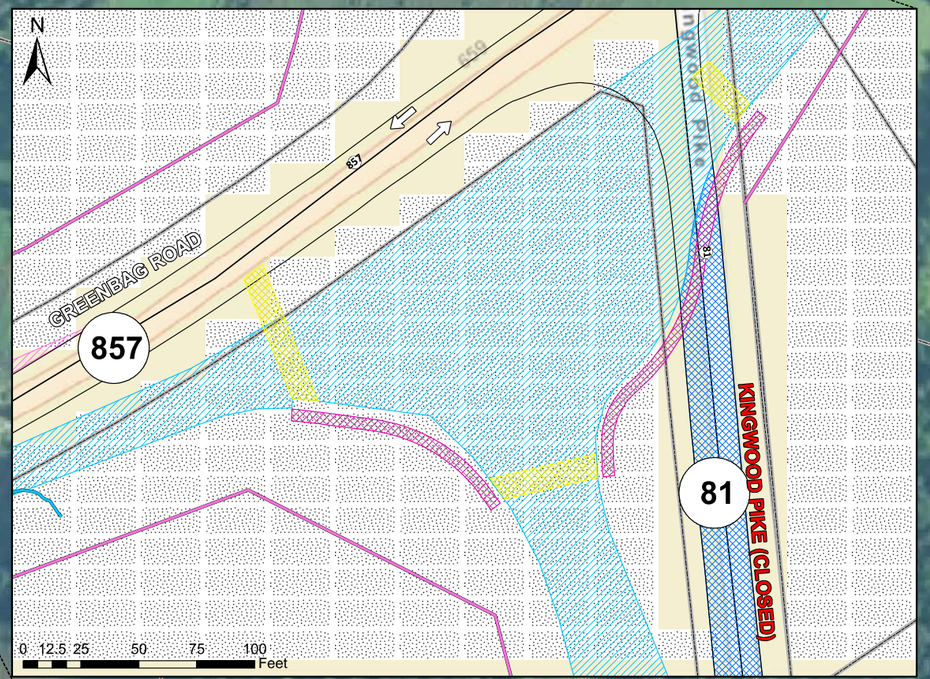
KINGWOOD PIKE CLOSED.
USE DETOUR

TO REEDSVILLE

81



(EXTENT INDICATOR 2 - SHORT-TERM WORK)



(EXTENT INDICATOR 1 - ROUNDABOUT CONSTRUCTION)

- Direction of Traffic
- Point of Interest
- Existing Road
- Property Easement Lines
- Proposed Right-of-way
- Streams
- Crosswalk
- Parcel Boundary
- Pavement Removal
- Roundabout Construction
- Short-Term Work
- Sidewalk
- Temporary Widening
- Wetlands

N

0 90 180 360 540 Feet

GREENBAG PUBLIC MEETING - 04/16/2019

TRAFFIC DETOUR

FROM KINGWOOD PIKE (COUNTY ROAD 81) TO GREENBAG ROAD (COUNTY ROAD 857)

TRUCK DETOUR:

- TRAVELING NORTH ON KINGWOOD PIKE (COUNTY ROAD 81), TURN RIGHT ONTO SUMMERS SCHOOL ROAD (COUNTY ROAD 72).
- CONTINUE ON SUMMERS SCHOOL ROAD (CR 72) THROUGH WHERE IT BECOMES COUNTY ROAD 70/1.
- CONTINUE RIGHT ON SUMMERS SCHOOL ROAD WHERE IT RUNS ALONG WITH COUNTY ROAD 70 (AARONS CREEK ROAD) AND CONTINUE LEFT ONTO 70/3 WHERE CR 70 VEERS RIGHT.
- TURN LEFT ONTO EARL CORE ROAD (WEST VIRGINIA 7) AND CONTINUE INTO SABRATON.
- TURN LEFT ONTO GREENBAG ROAD (COUNTY ROAD 857) AND CONTINUE UNTIL KINGWOOD PIKE INTERSECTION.

APPROXIMATE DETOUR LENGTH: 10.6 MILES (3.8 MILES OUT OF WAY LENGTH) 25 MINUTES

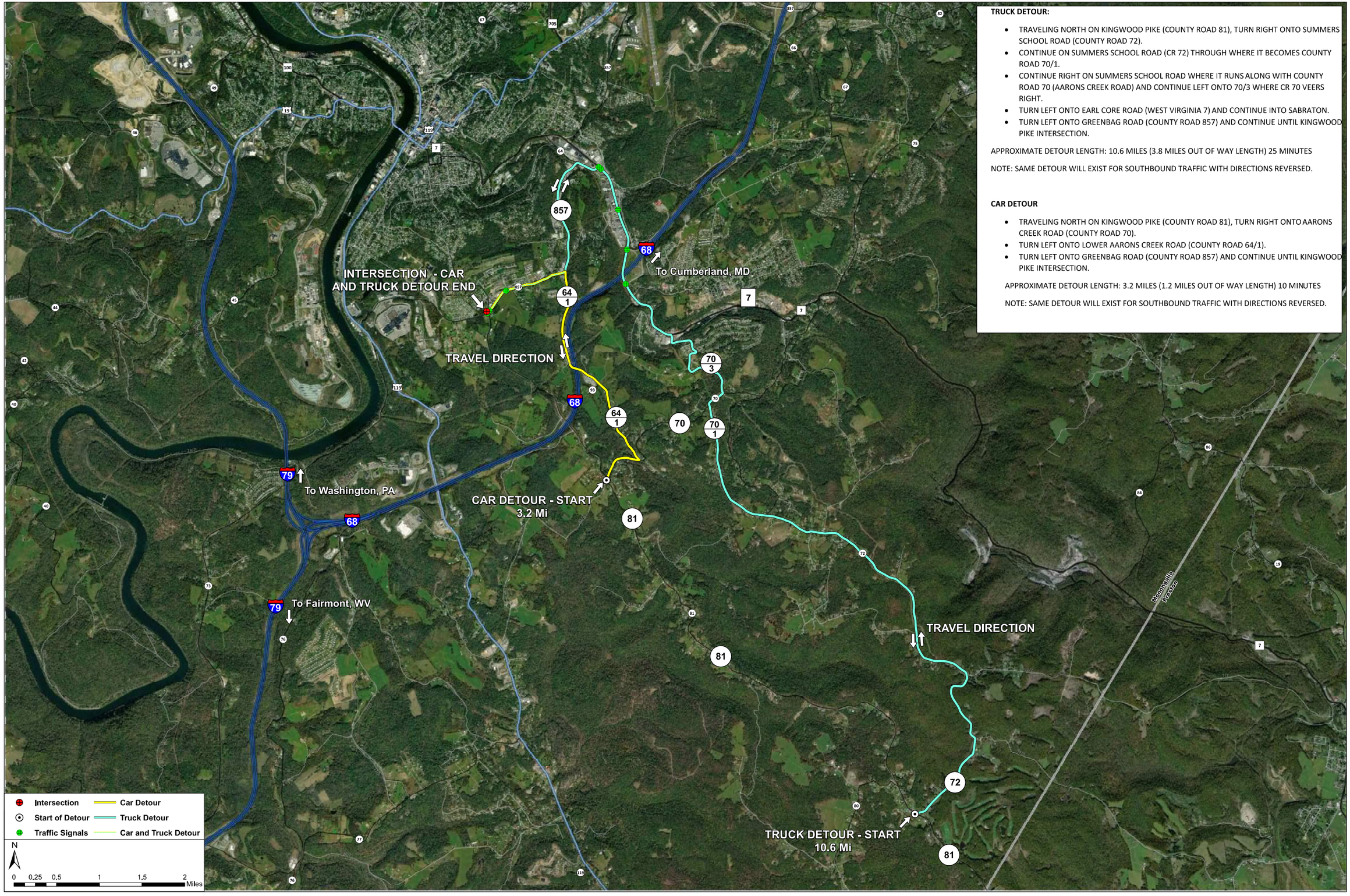
NOTE: SAME DETOUR WILL EXIST FOR SOUTHBOUND TRAFFIC WITH DIRECTIONS REVERSED.

CAR DETOUR

- TRAVELING NORTH ON KINGWOOD PIKE (COUNTY ROAD 81), TURN RIGHT ONTO AARONS CREEK ROAD (COUNTY ROAD 70).
- TURN LEFT ONTO LOWER AARONS CREEK ROAD (COUNTY ROAD 64/1).
- TURN LEFT ONTO GREENBAG ROAD (COUNTY ROAD 857) AND CONTINUE UNTIL KINGWOOD PIKE INTERSECTION.

APPROXIMATE DETOUR LENGTH: 3.2 MILES (1.2 MILES OUT OF WAY LENGTH) 10 MINUTES

NOTE: SAME DETOUR WILL EXIST FOR SOUTHBOUND TRAFFIC WITH DIRECTIONS REVERSED.



GREENBAG PUBLIC MEETING - 04/16/2019

STAGE 4

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)

Mountainview ★ Elementary School

857

TO SABRATON WEST VIRGINIA 7)

DORSEY AVE TO FIRST WARD, HOPECREST, SOUTH PARK

81

LUCKEY LANE 0.19 Mi

TEMPORARY TRAFFIC SIGNAL

GREENBAG ROAD

DORSEY AVE CLOSED. USE DETOUR

Atomic Grill

ROUNDABOUT CONSTRUCTION

TEMPORARY TRAFFIC SIGNAL

COMPLETED CONSTRUCTION

TO DON KOTTS BLVD (U.S. 119)

857

GREENBAG ROAD

PAVEMENT REMOVAL

KINGWOOD PIKE

TO REEDSVILLE

81

Direction of Traffic
Point of Interest
Temporary Traffic Signals
Detour
Existing Road
Paintlines
Proposed Right-of-way
Streams
Property Easement Lines
Crosswalk
Parcel Boundary
Pavement Removal
Stage 1-3
Roundabout Construction
Short-Term Work
Sidewalk
Wetlands

N

0 137.5 275 550 825 Feet

N

DORSEY AVE (CLOSED)

81

857

GREENBAG ROAD

857

GREENBAG ROAD

KINGWOOD PIKE

81

0 12.5 25 50 75 100 Feet

(EXTENT INDICATOR 1 - ROUNDABOUT CONSTRUCTION)

GREENBAG PUBLIC MEETING - 04/16/2019

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)



Greenbag Road Improvement Project

Appendix B

Aquatic Resources Report

Wetland and Surface Water Delineation Report

Prepared for the:

Greenbag Road Improvements Project
Federal - STP-0857(019)D
State – U331-857-0.67 00

City of Morgantown
Monongalia County, West Virginia

Prepared for:

The West Virginia Department of Transportation
Division of Highways
1334 Smith Street
Charleston, WV 25305-0430

Prepared by:

3689 Route 711
Ligonier, PA 15658

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Project Mapping.....Appendix A

Wetland and Stream Data Forms .....Appendix B

Wetland and Stream Function Evaluation Forms.....Appendix C

Resource Photographs.....Appendix D

INTRODUCTION

Representatives from The Markosky Engineering Group, Inc. conducted an aquatic resource investigation for the Greenbag Road Improvements Project on February 4, 2019, March 13, 2019, March 26, 2019, April 16, 2019, and October 8, 2019. The project area is located in The City of Morgantown, Monongalia County, West Virginia. The project involved improvements to Greenbag Road including shoulder and lane widening, the addition of a sidewalk in areas, intersection improvements with the addition of roundabout intersections where appropriate. The box culvert carrying Greenbag Road over Cobun Creek will be replaced with a wider box culvert to accommodate the widened roadway. Project mapping in Appendix A of this report includes a Project Location Map and an Aquatic Resources Map. The Aquatic Resources Map includes National Wetland Inventory (NWI) wetlands, delineated aquatic resources, mapped soil units, sample points, and photograph locations.

The project area is located within the Upper Monongahela watershed (HUC8: 05020003) and more specifically, the Cobun Creek-Monongahela watershed (HUC 12: 050200030307) and the Outlet Deckers Creek watershed (HUC12: 050200030202), which includes Aaron Creek. Neither Cobun Creek nor Aaron Creek are listed as Tier 3 streams by the West Virginia Department of Environmental Protection (WVDEP). Cobun Creek is listed as a Group 1-High Quality and State Mussel Stream by the West Virginia Department of Natural Resources (WVDNR); Aaron Creek is not. According to the *305(b) designated use and overall category designation*, both Cobun Creek and Aaron Creek are listed as Category 4a streams (waters that are impaired for one or more uses and have TMDL). According to West Virginia's 2016 *Integrated Water Quality Monitoring and Assessment Report* Section 303(d) list, Cobun Creek has a TMDL for fecal coliform and Aaron Creek has TMDLs for fecal coliform, iron, and CNA-Biological; therefore, both are characterized as Tier 1 Streams.

BACKGROUND INFORMATION FINDINGS

NATIONAL WETLAND INVENTORY (NWI)

A review of the United States Fish and Wildlife Service's Wetlands Mapper, NWI-V2 mapping determined that two (2) NWI wetland systems are present within the project study area and are depicted on the Aquatic Resources Map in Appendix A. These NWI wetland systems are identified as riverine, unknown perennial, unconsolidated bottom, permanently flooded (R5UBH) type wetland. During field investigations, Cobun Creek and Aaron Creek were present within these NWI wetlands.

WEB SOIL SURVEY

Review of the USDA Web Soil Survey database for Marion and Monongalia Counties, West Virginia identified ten (10) soil map units within the study area. Six (6) of these soil map units are identified as hydric soils. Table 1 identifies the soil map units within the project study area and their associated hydric ratings. Project study area soil map unit boundaries can be found on the Aquatic Resources Map in Appendix A.

TABLE 1
Project Area Soil Map Units

Soil Map Unit Abbreviation	Soil Map Unit Name	Hydric Soil	Hydric Rating
CkC	Clarksburg silt loam, 8 to 15 percent slopes	Yes	2
CkD	Clarksburg silt loam, 15 to 25 percent slopes	Yes	2
GuC	Gilpin-Culleoka-Upshur silt loams, 8 to 15 percent slopes	No	0
GuD	Gilpin-Culleoka-Upshur silt loams, 15 to 25 percent slopes	No	0
Lb	Lobdell silt loam, 0 to3 percent slopes, occasionally flooded	Yes	10
Lh	Lobdell-Holly silt loams	Yes	30
MgC	Monongahela silt loam, 8 to 15 percent slopes	Yes	5
U1	Udorthents, cut and fill	No	0
ZoB	Zoar silt loam, 3 to 8 percent slopes	Yes	5
ZoC	Zoar silt loam, 8 to 15 percent slopes	No	0

WETLAND IDENTIFICATION AND DELINEATION METHODOLOGY

The wetland identification and delineation investigation was conducted in accordance with the methodology described in the US Army Corps of Engineers (USACE) *Corps of Engineers Wetland Delineation Manual* (Technical Report Y-87-1) and the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0). The wetlands were classified utilizing the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979).

Wetland functions were assessed in the field following procedures and protocols described in the United States Army Corps of Engineers (USACE), New England District's, *The Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach* (NAEEP-360-1-30a) (1999). Wetland functional parameters evaluated include:

- Groundwater Recharge/Discharge (GRD)
- Floodflow Alteration (FA)
- Fish and Shellfish Habitat (FSH)
- Sediment/ Toxicant Retention (STR)
- Nutrient Removal (NR)
- Production Export (PE)
- Sediment/Shoreline Stabilization (SSS)
- Wildlife Habitat (Breeding, Wintering, Migration) (WH)
- Recreation (REC)
- Educational/Scientific Value (ESV)

- Uniqueness/Heritage (UH)
- Visual Quality/Aesthetics (VQA)
- Endangered Species Habitat (ESH)

WETLAND IDENTIFICATION FINDINGS

Utilizing the methodology described above, eight (8) palustrine wetlands were identified and delineated within the study area. Please see Table 2 below for a summary of wetland characteristics. The location of the wetlands within the project area can be found on the Aquatic Resource Map included in Appendix A of this report. Refer to Appendix B for dataforms containing detailed information about each wetland and upland area and refer to Appendix D to review photos of each resource. Additionally, an upland sample point (Roadside Drainage UPL) was recorded to demonstrate upland conditions present in a roadside drainage feature north of Greenbag Road and east of Mississippi Street. The location of this upland sample point within the project study area can be found on the Aquatic Resource Map included in Appendix A of this report. Refer to Appendix B for the dataform containing detailed information.

WL1 was classified as a 75% PEM / 25% PFO wetland located within the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, saturation, and oxidized rhizospheres on living roots. Wetland hydrology is present within WL1.

Dominant vegetation observed within this wetland includes boxelder (*Acer negundo*), arrowleaf tearthumb (*Polygonum sagittatum*), and wingstem (*Verbesina alternifolia*). The vegetation observed within this wetland meets the Dominance Test. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified two soil horizons from 0 to 18 inches. The first soil horizon (from 0 to 2 inches) displayed a soil matrix color of 10YR 3/2 (100%) and a silt loam texture. The second soil horizon (from 2 to 18 inches) displayed a soil matrix color of 10YR 4/2 (97%) with redox features the color of 7.5YR 5/8 (3%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F3: Depleted Matrix. The soil matrix colors and features indicate this is a hydric soil.

WL2 was classified as a 70% PEM / 30% PSS wetland located within in the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, saturation, and oxidized rhizospheres on living roots with geomorphic position as a secondary indicator. Wetland hydrology is present within WL2.

Dominant vegetation observed within this wetland includes silky dogwood (*Cornus amomum*) and rice cutgrass (*Leersia oryzoides*). The vegetation observed within this wetland meets the Rapid Test for Hydrophytic vegetation. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified one soil horizon from 0 to 18 inches. The soil horizon (from 0 to 18 inches) displayed a soil matrix color of 10YR 3/3 (80%) with redox features the color of 7.5YR 5/8 (20%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the

description of Indicator F8: Redox Depressions. The soil matrix colors and features indicate this is a hydric soil.

WL3 was classified as a 100% PEM wetland located within in the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, saturation, and water-stained leaves. Wetland hydrology is present within WL3.

Dominant vegetation observed within this wetland includes black willow (*Salix nigra*) and soft rush (*Juncus effusus*). The vegetation observed within this wetland meets the Rapid Test for Hydrophytic vegetation. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified one soil horizon from 0 to 18 inches. The soil horizon (from 0 to 18 inches) displayed a soil matrix color of 10YR 3/1 (70%) with redox features the color of 7.5YR 5/8 (30%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F6: Redox Dark Surface. The soil matrix colors and features indicate this is a hydric soil.

WL4 was classified as a 100% PEM wetland located within in the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, saturation, and water-stained leaves with drainage patterns as a secondary indicator. Wetland hydrology is present within WL4.

Dominant vegetation observed within this wetland includes multiflora rose (*Rosa multiflora*), broadleaf cattail (*Typha latifolia*), and soft rush. The vegetation observed within this wetland meets the Dominance Test. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified one soil horizon from 0 to 18 inches. The soil horizon (from 0 to 18 inches) displayed a soil matrix color of 2.5Y 3/2 (70%) with redox features the color of 10YR 5/8 (30%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F6: Redox Dark Surface. The soil matrix colors and features indicate this is a hydric soil.

WL5 was classified as a 100% PEM wetland located within in the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, saturation, and water-stained leaves with drainage patterns as a secondary indicator. Wetland hydrology is present within WL5.

The only dominant vegetation observed within this wetland was broadleaf cattail. The vegetation observed within this wetland meets the Rapid Test for Hydrophytic vegetation. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified one soil horizon from 0 to 18 inches. The soil horizon (from 0 to 18 inches) displayed a soil matrix color of 2.5Y 3/2 (70%) with redox features the color of 10YR 5/8 (30%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the

description of Indicator F6: Redox Dark Surface. The soil matrix colors and features indicate this is a hydric soil.

WL6 was classified as an 80% PFO / 20% PEM wetland located within in the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, and saturation with drainage patterns and geomorphic position as secondary indicators. Wetland hydrology is present within WL6.

Dominant vegetation observed within this wetland includes boxelder, American sycamore (*Platanus occidentalis*), multiflora rose, moneywort (*Lysimachia nummularia*) and rice cutgrass. The vegetation observed within this wetland meets the Dominance Test. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified one soil horizon from 0 to 18 inches. The soil horizon (from 0 to 18 inches) displayed a soil matrix color of 2.5Y 5/2 (60%) with redox features the color of 10YR 5/6 (40%) and a silt loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F3: Depleted Matrix. The soil matrix colors and features indicate this is a hydric soil.

WL7 was classified as a 75% PEM / 25% PFO wetland located within the study area. Primary wetland hydrology indicators observed within this wetland include surface water, high water table, and saturation with drainage patterns and geomorphic position as secondary indicators. Wetland hydrology is present within WL7.

Dominant vegetation observed within this wetland includes flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), multiflora rose, sassafras (*Sassafras albidum*), European privet (*Ligustrum vulgare*), rice cutgrass, soft rush, and woolgrass (*Scirpus cyperinus*). The vegetation observed within this wetland meets the Prevalence Index Test. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified two soil horizons from 0 to 18 inches. The first soil horizon (from 0 to 9 inches) displayed a soil matrix color of 10YR 3/2 (70%) with redox features the color of 7.5YR 5/8 (30%) and a clay loam texture. The second soil horizon (from 9 to 18 inches) displayed a soil matrix color of 2.5Y 3/1 (50%) with redox features the color of 10YR 5/8 (50%) and a clay loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F6: Redox Dark Surface. The soil matrix colors and features indicate this is a hydric soil.

WL8 was classified as a 100% PEM wetland located within the study area. Primary wetland hydrology indicators observed within this wetland include surface water and saturation. Wetland hydrology is present within WL8.

The only dominant vegetation observed within this wetland was broadleaf cattail. The vegetation observed within this wetland meets the Rapid Test for Hydrophytic vegetation. Hydrophytic vegetation is dominant within this wetland.

The soil test pit identified two soil horizons from 0 to 18 inches. The first soil horizon (from 0 to 4 inches) displayed a soil matrix color of 10YR 3/2 (100%) and a silt loam texture. The second soil horizon (from 4 to 18 inches) displayed a soil matrix color of 10YR 4/1 (80%) with redox features the color of 7.5YR 5/8 (20%) and a clay loam texture. Hydric soil indicators observed within this wetland meet the description of Indicator F3: Depleted Matrix. The soil matrix colors and features indicate this is a hydric soil.

Project area wetlands were assessed using New England District's Functional Evaluation Forms. Please refer to Appendix C and Table 2 below for more detailed information on the functions provided by each wetland.

TABLE 2
Wetland Summary Table

Wetland ID	Classification	Size (acres)	Wetland Functions
Wetland WL1	75% PEM / 25% PFO	0.52	• Groundwater Recharge/Discharge • Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Wildlife Habitat (B,W,M)
Wetland WL2	70% PEM / 30% PSS	0.05	• Groundwater Recharge/Discharge • Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Sediment/Shoreline Stabilization • Wildlife Habitat (B,W,M)
Wetland WL3	100% PEM	0.04	• Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Wildlife Habitat (B,W,M)
Wetland WL4	100% PEM	0.04	• Groundwater Recharge/Discharge • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Wildlife Habitat (B,W,M)
Wetland WL5	100% PEM	0.007	• Groundwater Recharge/Discharge • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Wildlife Habitat (B,W,M)

Wetland ID	Classification	Size (acres)	Wetland Functions
Wetland WL6	80% PFO / 20% PEM	0.29	• Groundwater Recharge/Discharge • Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Sediment/Shoreline Stabilization • Wildlife Habitat (B,W,M)
Wetland WL7	75% PEM / 25% PFO	0.19	• Groundwater Recharge/Discharge • Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Sediment/Shoreline Stabilization • Wildlife Habitat (B,W,M)
Wetland WL8	100 % PEM	0.06	• Groundwater Recharge/Discharge • Floodflow Alteration • Sediment/Toxicant Retention • Nutrient Removal • Production Export • Wildlife Habitat (B,W,M)

SURFACE WATER IDENTIFICATION AND DELINEATION METHODOLOGY

The project study area surface waters were classified as either ephemeral, intermittent, or perennial according to the definitions set forth in *Title 46 and the West Virginia Surface Mining Rules*. Field investigations were undertaken to document the physical characteristics of the evaluated surface waters and the presence or absence of fish species. A cursory characterization of the existing macroinvertebrate community was conducted by physically turning suitable in-stream substrates and identifying the benthic macroinvertebrates observed to the level of order. All macroinvertebrates were identified in the field using *Freshwater Macroinvertebrates of North America* (Peckarsky, et al, 1990). A detailed macroinvertebrate survey was not conducted for the project.

The surface water investigation consisted of reviewing existing information and field investigations. Existing information utilized for this study included: United States Geological Survey (USGS), Monongalia County mosaic, W.VA., 7.5 minute topographical quadrangle; West Virginia *Title 46 Legislative Rule, Environmental Quality Board, Series 1, Requirements Governing Water Quality Standards (46 Code of State Regulations [CSR] 1)*; and the West Virginia Division of Natural Resources (WVDNR) *West Virginia Trout Stocking Schedule*.

The following are the definitions for the types of streams, as defined in *Title 46 and the West Virginia Surface Mining Rules*:

- *Perennial Streams* – Streams or a portion of a stream that flow(s) continuously.
- *Intermittent Streams* – Streams which have no flow during sustained periods of no precipitation, and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six months.
- *Ephemeral (or Wet Weather) Streams* – Streams that flow only in direct response to precipitation or whose channels are at all times above the water table.

SURFACE WATER IDENTIFICATION FINDINGS

Utilizing the methodology described above, thirteen (13) jurisdictional watercourses were identified and investigated within the project study area. Please see Table 3 below for a summary of stream characteristics. Two sample points were collected on STR10 in order to adequately characterize the differences observed between the upstream (US Point) and downstream (DS Point) reaches. The location of the streams within the project area can be found on the Aquatic Resource Map included in Appendix A of this report. Refer to Appendix B for dataforms containing detailed information about each resource and refer to Appendix D to review photos of each resource.

STR 1 (Cobun Creek) is a perennial stream located within the project area. Cobun Creek flows in a northwestern direction through the project area. The NWI wetland system, R5UBH, is associated with this stream. Bank width for Cobun Creek is approximately 25-feet and the channel depth is 4-feet. Cobun Creek had a water depth of 1-foot and a water width of 15-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, cobble, gravel, and sand. The true fly (*Diptera)* and leech *(Hirudinea)* macroinvertebrate orders were observed during the field view. Unidentified fin fish species were observed within Cobun Creek.

STR 2 is a perennial stream located within the project area. STR 2 flows in a southwestern direction through the project area to its confluence with Cobun Creek. The bank width for STR 2 is approximately 10-feet and the channel depth is 4-feet. STR 2 had a water depth of 1-foot and a water width of 6-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, clay, cobble, detritus, gravel, muck, and silt. The true fly and leech macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 3 is a perennial stream located within the project area. STR 3 flows in a southwestern direction through the project area to its confluence with Cobun Creek. The bank width for STR 3 is approximately 3-feet and the channel depth is 1-foot. STR 3 had a water depth of 4-inches and a water width of 1.5-feet at the time of the investigation. The substrate in the stream consists of a mixture of cobble, detritus, gravel, sand, and silt. The true fly and caddisfly (*Trichoptera*) macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 4 is an intermittent stream located within the project area. STR 4 flows in a southwestern direction through the project area to its confluence with Cobun Creek. The bank width for STR 4 is approximately 3-feet and the channel depth is 8-inches. STR 4 had a water depth of 4-inches and a water width of 2-feet at the time of the investigation. The substrate in the stream consists of a mixture of detritus, gravel, muck, sand, and silt. The caddisfly and snail (*Gastropoda*) macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 5 is a perennial stream located within the project area. STR 5 flows in a southeastern direction through the project area to its confluence with Cobun Creek. The bank width for STR 5 is approximately 5-feet and the channel depth is 1-foot. STR 5 had a water depth of 3-inches and a water width of 2.5-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, cobble, detritus, gravel, muck, sand, and silt. The true fly and snail macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 6 is a perennial stream located within the project area. STR 6 flows in a southwestern direction through the project area to its confluence with Cobun Creek. The bank width for STR 6 is approximately 4-feet and the channel depth is 3-feet. STR 6 had a water depth of 3-inches and a water width of 2.5-feet at the time of the investigation. The substrate in the stream consists of a mixture of clay, cobble, detritus, gravel, muck, sand, and silt. The leech macroinvertebrate order was observed during the field view. No fin fish species were observed at the time of investigation.

STR 7 is a perennial stream located within the project area. STR 7 flows in a south-southwestern direction through the project area to its confluence with Cobun Creek (outside of the natural resources area of investigation). The bank width for STR 7 is approximately 2-feet and the channel depth is 1-foot. STR 7 had a water depth of 1-inch and a water width of 1.5-feet at the time of the investigation. The substrate in the stream consists of a mixture of detritus, muck, sand, and silt. The flatworm (*Planariidae*) was the only macroinvertebrate family observed during the field view. No fin fish species were observed at the time of investigation.

STR 8 is an intermittent stream located within the project area. STR 8 flows in a southwestern direction through the project area to its confluence with STR 7. The bank width for STR 8 is approximately 5-feet and the channel depth is 1-foot. STR 8 had a water depth of 2-inches and a water width of 1-foot at the time of the investigation. The substrate in the stream consists of a mixture of cobble, detritus, gravel, muck, sand, and silt. The caddisfly macroinvertebrate order was observed during the field view. No fin fish species were observed at the time of investigation.

STR 9 is a perennial stream located within the project area. STR 9 flows in a northwestern direction through the project area to its confluence with STR 7. The bank width for STR 9 is approximately 1-foot and the channel depth is 1.5-feet. STR 9 had a water depth of 1-inch and a water width of 6-inches at the time of the investigation. The substrate in the stream consists of a mixture of cobble, gravel, and silt. The caddisfly and sowbug (*Isopoda*) macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 10 (US Point) is a perennial stream located within the project area. STR 10 (US Point) flows in an eastern direction through the project area to its confluence with Aaron Creek. The bank width for STR 10 (US Point) is approximately 6-feet and the channel depth is 1-foot. STR 10 (US Point) had a water depth of 2-inches and a water width of 3-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, cobble, gravel, and sand. The caddisfly and snail macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 10 (DS Point) is a perennial stream located within the project area. STR 10 (DS Point) flows in a northeastern direction through the project area to its confluence with Aaron Creek. The bank

width for STR 10 (DS Point) is approximately 8-feet and the channel depth is 1-foot on the left descending bank and 2-feet on the right descending bank. STR 10 (DS Point) had a water depth of 2-inches and a water width of 5-feet at the time of the investigation. The substrate in the stream consists of a mixture of cobble, gravel, sand, and silt. The caddisfly was the only macroinvertebrate order observed during the field view. No fin fish species were observed at the time of investigation.

STR 11 is a perennial stream located within the project area. STR 11 flows in a northeastern direction through the project area to its confluence with STR 10. The bank width for STR 11 is approximately 3-feet and the channel depth is 3-feet. STR 11 had a water depth of 1.5-inches and a water width of 2-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, cobble, gravel, sand, and silt. The caddisfly and snail macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 12 (Aaron Creek) is a perennial stream located within the project area. Aaron Creek flows in a northern direction through the project area to its confluence with Deckers Creek. The bank width for Aaron Creek is approximately 30-feet and the channel depth is 15-inches. Aaron Creek had a water depth of 8-inches and a water width of 25-feet at the time of the investigation. The substrate in the stream consists of a mixture of boulders, cobble, gravel, and sand. The caddisfly and stonefly (*Plecoptera*) macroinvertebrate orders were observed during the field view. No fin fish species were observed at the time of investigation.

STR 13 is an intermittent stream located within the project area. STR 13 flows in a northwestern direction through the project area to its confluence with Cobun Creek. The bank width for STR 13 is approximately 4-feet and the channel depth is 1.5-feet. STR 13 had a water depth of 0.5-inches and a water width of 4-inches at the time of the investigation. The substrate in the stream consists of a mixture of boulders, clay, cobble, detritus, gravel, and sand. The caddisfly macroinvertebrate order and the flatworm macroinvertebrate family were observed during the field view. No fin fish species were observed at the time of investigation.

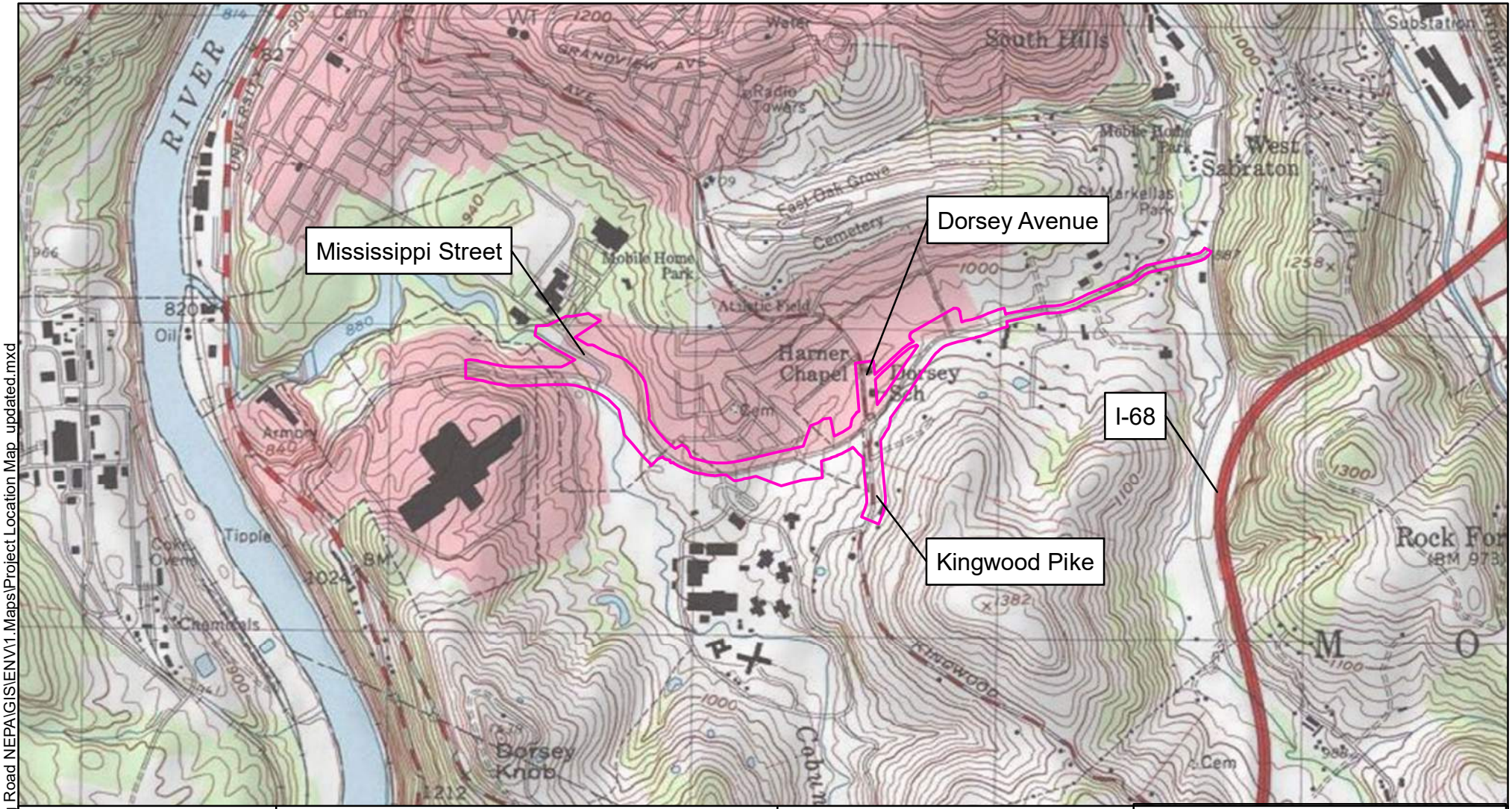
Project area streams were assessed in accordance with the methodology outlined in the U.S. Army Corps of Engineers *Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia* (ERDC/EL TR-17-1) (Summers et. al, 2017). While the flow regime of each project area stream was determined using definitions set forth in *Title 46 and the West Virginia Surface Mining Rules,* as indicated above, the High-Gradient Headwater Stream in Appalachia Field Datasheet was used to evaluate streams with greater than 4% channel slope, and the Low-Gradient Perennial Streams in Appalachia Field Data Sheet was used to evaluate streams with less than 4% channel slope. Please refer to Appendix C for more detailed information regarding these assessments.

TABLE 3:
Stream Summary Table

Stream ID	Stream Name	Stream Type	Total Stream Length (feet)	Culverted Stream Length (feet)
STR 1	Cobun Creek	Perennial	1,518	75
STR 2	UNT to Cobun Creek	Perennial	413	-
STR 3	UNT to Cobun Creek	Perennial	332	-

Stream ID	Stream Name	Stream Type	Total Stream Length (feet)	Culverted Stream Length (feet)
STR 4	UNT to Cobun Creek	Intermittent	193	-
STR 5	UNT to Cobun Creek	Perennial	182	-
STR 6	UNT to Cobun Creek	Perennial	530	73
STR 7	UNT to Cobun Creek	Perennial	868	391 (122ft culverted; 269ft subsurface)
STR 8	UNT to Cobun Creek	Intermittent	588	27
STR 9	UNT to Cobun Creek	Perennial	322	50
STR 10 (US)	UNT to Aaron Creek	Perennial	2121	482
STR 10 (DS)	UNT to Aaron Creek	Perennial		
STR 11	UNT to Aaron Creek	Perennial	290	319
STR 12	Aaron Creek	Perennial	289	44
STR 13	UNT to Cobun Creek	Intermittent	214	114

APPENDIX A
Project Mapping



MARKOSKY

West Virginia Division of Highways
Federal Project STP-0857(019)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Topography Source: National Geographic Society (NGS)

N W E S

0 1,000 2,000 4,000 Feet

0 350 700 1,400 Meters

Date: 11/1/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV\1.Maps\Project Location Map_updated.mxd

W
PUBHh
U1
MgC
ZoB
ZoC
UeD
CwE
DgC
DgB
CwF
CwD
Lb
CkD
GuD

STR 2 (Perennial)
Latitude: 39.60988°
Longitude: -79.95754°

STR 3 (Perennial)
Latitude: 39.61035°
Longitude: -79.95592°

STR 4 (Intermittent)
Latitude: 39.60975°
Longitude: -79.95728°

STR 13 (Intermittent)
Latitude: 39.60831°
Longitude: -79.95486°

Wetland WL3
(100% PEM)
Latitude: 39.60891°
Longitude: -79.95631°

Wetland WL8
(100% PEM)
Latitude: 39.60859°
Longitude: -79.95391°

Wetland WL4
(100% PEM)
Latitude: 39.60851°
Longitude: -79.95849°

Wetland WL5
(100% PEM)
Latitude: 39.60851°
Longitude: -79.95754°

STR 5 (Perennial)
Latitude: 39.60845°
Longitude: -79.95579°

STR 1 (Cobun Creek) (Perennial)
Latitude: 39.60819°
Longitude: -79.95543°

R5UBH
WL3-UPL
WL4- and WL5-UPL
WL8-UPL
Roadway Drainage UPL

Page 1
Page 2

MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Aquatic Resource Map
Page 1 of 4

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

0 100 200 400 Feet
0 25 50 100 Meters

- Stream
- Wetland
- Wetland Sample Point
- Stream Sample Point
- Upland Sample Point
- Photo Locations
- Natural Resources Area of Investigation
- National Wetland Inventory
- Soils

Date: 4/16/2020

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Roadway Drainage UPL

Page 1

Page 2

Page 3

Lb

WL6-UPL

Wetland WL6
(80% PFO / 20% PEM)
Latitude: 39.60689°
Longitude: -79.95393°

STR 6 (Perennial)
Latitude: 39.60643°
Longitude: -79.95267°

STR 7 (Perennial)
Latitude: 39.60603°
Longitude: -79.94803°

Wetland WL2
(30% PSS / 70% PEM)
Latitude: 39.60708°
Longitude: -79.94683°

WL2-UPL

GuC

WL7-UPL

WL1-UPL

Wetland WL7
(75% PEM / 25% PFO)
Latitude: 39.60579°
Longitude: -79.94837°

Wetland WL1
(75% PEM / 25% PFO)
Latitude: 39.60577°
Longitude: -79.94769°

STR 8 (Intermittent)
Latitude: 39.60628°
Longitude: -79.94703°

R5UBH

CkC

STR 9 (Perennial)
Latitude: 39.60511°
Longitude; -79.94454°

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Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Aquatic Resource Map
Page 2 of 4

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

0 100 200 400 Feet

0 25 50 100 Meters

- Stream
- Wetland
- Wetland Sample Point
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Date: 4/16/2020

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV\1.Maps\Aquatic Resource Map_Sheet 2.mxd

CkC
CwE
ZoB
ZoC
Lh
Page 4
Page 3
ZoB
ZoB
33
34
STR 10 (US Point) (Perennial)
Latitude: 39.61025°
Longitude: -79.93978°
PUBHh
PUBHh
CkC
CkD
GuD
CkD
DgD
Page 2
Page 3

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Aquatic Resource Map
Page 3 of 4

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

MARKOSKY

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W
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S

0 100 200 400 Feet

0 25 50 100 Meters

- Stream
- Wetland
- Wetland Sample Point
- Stream Sample Point
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- Photo Locations
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Date: 11/1/2019

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CwF
DgC
CwF
R5UBH
DgC
CwE
CkC
CwF
DgC
Lh
ZoC
ZoB
Page 3
Page 4
STR 11 (Perennial)
Latitude: 39.61123°
Longitude: -79.93582°
STR 12 (Aaron Creek) (Perennial)
Latitude: 39.61212°
Longitude: -79.93338°
STR 10 (DS Point) (Perennial)
Latitude: 39.61167°
Longitude: -79.93481°
35
36
37
38
39
40

MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Aquatic Resource Map
Page 4 of 4

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

N
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S

0 100 200 400 Feet

0 25 50 100 Meters

- Stream
- Wetland
- Wetland Sample Point
- Stream Sample Point
- Upland Sample Point
- Photo Locations
- Natural Resources Area of Investigation
- National Wetland Inventory
- Soils

Date: 11/1/2019

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APPENDIX B
Wetland and Stream Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL1

Investigator(s): JMG, JAR | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 5% | Lat 39.60577° | Long: -79.94769°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkC | NWI classification: 75% PEM/25% PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes X	No ____	Depth (inches) 0.5"
Water Table Present?	Yes X	No ____	Depth (inches) 1"
Saturation Present? (Including capillary fringe)	Yes X	No ____	Depth (inches) Surface

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum* - silver maple	3	No	FACW
2. *Acer negundo* - boxelder	50	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	53	= Total Cover	
50% of Total Cover:	26.5	20% of Total Cover:	10.6
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0	= Total Cover	
50% of Total Cover:	0	20% of Total Cover:	0
Herb Stratum (Plot size: 5')			
1. *Polygonum sagittatum* - arrowleaf tearthumb	40	Yes	OBL
2. *Leersia oryzoides* - ricecut grass	15	No	OBL
3. *Verbesina alternifolia* - wingstem	30	Yes	FAC
4. *carex species* - sedge species*	10*	-	-
5. *graminae species* - grass species*	45*	-	-
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	= Total Cover	
50% of Total Cover:	42.5	20% of Total Cover:	17
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0	= Total Cover	
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No ____**

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Gramineae* and *Carex* species could not be positively identified due to lack of distinguishing vegetative characteristics, they were not included in the hydrophytic tests

SOIL Sampling Point WL1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100	-	-	-	-	Silt Loam	
2-18	10YR 4/2	97	7.5YR 5/8	3	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virgnia | Sampling Point: WL2

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. floodplain | Local relief (concave, convex, none): concave

Slope (%): 0-2% | Lat 39.60708° | Long: -79.94683°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: ZoB | NWI classification: 70% PEM / 30% PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes X	No ____	Depth (inches) 0.5"
Water Table Present?	Yes X	No ____	Depth (inches) 10"
Saturation Present? (Including capillary fringe)	Yes X	No ____	Depth (inches) Surface

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1. *Cornus amomum* - silky dogwood	25	Yes	FACW
2. *Acer negundo* - boxelder	5	No	FAC
3. *Rosa multiflora*- multiflora rose	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35 = Total Cover		
50% of Total Cover:	17.5	20% of Total Cover:	7
Herb Stratum (Plot size: 5')			
1. *Leersia oryzoides* - rice cutgrass	70	Yes	OBL
2. *Carex species* - sedge species	10*	-	-
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		
50% of Total Cover:	35	20% of Total Cover:	14
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0[1]

4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Carex* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/3	80	7.5YR 5/8	20	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

____ Histosol (A1)
____ Histic Epipedon (A2)
____ Black Histic (A3)
____ Hydrogen Sulfide (A4)
____ Stratified Layers (A5)
____ 2 cm Muck (A10) **(LRR N)**
____ Depleted Below Dark Surface (A11)
____ Thick Dark Surface (A12)
____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
____ Sandy Gleyed Matrix (S4)
____ Sandy Redox (S5)
____ Stripped Matrix (S6)

____ Dark Surface (S7)
____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
____ Thin Dark Surface (S9) (**MLRA 147, 148)**
____ Loamy Gleyed Matrix (F2)
____ Depleted Matrix (F3)
____ Redox Dark Surface (F6)
____ Depleted Dark Surface (F7)
__X__ Redox Depressions (F8)
____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
____ Umbric Surface (F13) (**MLRA 136, 122)**
____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

____ 2 cm Muck (A10) (**MLRA 147**)
____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
____ Very Shallow Dark Surface (TF12)
____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type:

Depth (inches):

Hydric Soil Present? **Yes** __X__ **No** ____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL3

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): concave

Slope (%): 10% | Lat 39.60891° | Long: -79.95631°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkD | NWI classification: 100% PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 1"

Water Table Present? Yes X No ____ Depth (inches) 4"

Saturation Present? Yes X No ____ Depth (inches) Surface

(Including capillary fringe)

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1. *Salix nigra* - black willow	5	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	5 = Total Cover		
50% of Total Cover:	2.5	20% of Total Cover:	1
Herb Stratum (Plot size: 5')			
1. *Dipsacus fullonum* - Fuller's teasel	5	No	FACU
2. *Phalaris arundinacea* - reed canarygrass	10	No	FACW
3. *Juncus effusus* - soft rush	60	Yes	FACW
4. *Apocynum cannabinum* - dogbane	10	No	FACU
5. *Eupatorium perfoliatum* - boneset	5	No	FACW
6. *Scirpus cyperinus* - woolgrass	5	No	FACW
7. *Typha latifolia* - broadleaf cattail	20	No	OBL
8.			
9.			
10.			
11.			
12.			
	115 = Total Cover		
50% of Total Cover:	57.5	20% of Total Cover:	23
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/1	70	7.5YR 5/8	30	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL4

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 10% | Lat 39.60851° | Long: -79.95849°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: GuD | NWI classification: 100% PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes X	No ____	Depth (inches) 0.5"
Water Table Present?	Yes X	No ____	Depth (inches) 4"
Saturation Present? (Including capillary fringe)	Yes X	No ____	Depth (inches) Surface

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	5 = Total Cover		
50% of Total Cover:	2.5	20% of Total Cover:	1
Herb Stratum (Plot size: 5')			
1. *Typha latifolia* - broadleaf cattail	55	Yes	OBL
2. *Juncus effusus* - soft rush	20	Yes	FACW
3. *Eutrochium maculatum - joe pye weed*	10	No	FACW
4. *Asclepias syriaca* – common milkweed	5	No	FACU
5. *Asteraceae species* - aster species*	5*	-	-
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of Total Cover:	45	20% of Total Cover:	18
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the Asteraceae species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5Y 3/2	70	10YR 5/8	30	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virgnia | Sampling Point: WL5

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 5-7% | Lat 39.60851° | Long: -79.95754°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkD | NWI classification: 100% PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes X	No ____	Depth (inches) 2"
Water Table Present?	Yes X	No ____	Depth (inches) 4"
Saturation Present? (Including capillary fringe)	Yes X	No ____	Depth (inches) Surface

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL5

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Herb Stratum (Plot size: 5')			
1. *Daucus carota* - Queen Anne's lace	15	No	OBL
2. *Eutrochium maculatum* - joe pye weed	5	No	FACW
3. *Juncus effusus* - soft rush	15	No	FACW
4. *Eupatorium perfoliatum* - boneset	5	No	FACW
5. *Typha latifolia* - broadleaf cattail	65	Yes	OBL
6. *Carex species* - sedge species*	20*	-	-
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		
50% of Total Cover:	52.5	20% of Total Cover:	21
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Carex* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5Y 3/2	70	10YR 5/8	30	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL6

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. floodplain | Local relief (concave, convex, none): concave

Slope (%): 0-2% | Lat 39.60689° | Long: -79.95393°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: Lb | NWI classification: 80% PFO/20% PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 2"

Water Table Present? Yes X No ____ Depth (inches) 5"

Saturation Present? Yes X No ____ Depth (inches) Surface

(Including capillary fringe)

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo* - boxelder	50	Yes	FAC
2. *Platanus occidentalis* - American sycamore	50	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		
50% of Total Cover:	50	20% of Total Cover:	20
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 = Total Cover		
50% of Total Cover:	10	20% of Total Cover:	4
Herb Stratum (Plot size: 5')			
1. *Lysimachia nummularia* - money wort	30	Yes	FACW
2. *Leersia oryzoides* - rice cutgrass	50	Yes	OBL
3. *Juncus effusus* - soft rush	5	No	FACW
4. *Onoclea sensibilis* - sensitive fern	5	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of Total Cover:	45	20% of Total Cover:	18
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No ____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point WL6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5Y 5/2	60	10YR 5/6	40	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

____ Histosol (A1)
____ Histic Epipedon (A2)
____ Black Histic (A3)
____ Hydrogen Sulfide (A4)
____ Stratified Layers (A5)
____ 2 cm Muck (A10) **(LRR N)**
____ Depleted Below Dark Surface (A11)
____ Thick Dark Surface (A12)
____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
____ Sandy Gleyed Matrix (S4)
____ Sandy Redox (S5)
____ Stripped Matrix (S6)

____ Dark Surface (S7)
____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
____ Thin Dark Surface (S9) (**MLRA 147, 148)**
____ Loamy Gleyed Matrix (F2)
__X__ Depleted Matrix (F3)
____ Redox Dark Surface (F6)
____ Depleted Dark Surface (F7)
____ Redox Depressions (F8)
____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
____ Umbric Surface (F13) (**MLRA 136, 122)**
____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

____ 2 cm Muck (A10) (**MLRA 147**)
____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
____ Very Shallow Dark Surface (TF12)
____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type:

Depth (inches):

Hydric Soil Present? **Yes** __X__ **No** ____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 3.26.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL7

Investigator(s): KMW, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope/ floodplain | Local relief (concave, convex, none): convex

Slope (%): 5-10% | Lat 39.60579° | Long: -79.94837°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: GuC, CkC | NWI classification: 75% PEM/ 25% PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Fed by numerous hillside seeps ; Iron staining observed at some of the seeps

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present? Yes X No ____ Depth (inches) 1"

Water Table Present? Yes X No ____ Depth (inches) Surface

Saturation Present? Yes X No ____ Depth (inches) Surface

(Including capillary fringe)

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus florida* - flowering dogwood	10	Yes	FACU
2. *Prunus serotina* - black cherry	25	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
50% of Total Cover:	17.5	20% of Total Cover:	7
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	25	Yes	FACU
2. *Sassafras albidum* - sassafras	10	Yes	FACU
3. *Ligustrum vulgare* - European privet	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45 = Total Cover		
50% of Total Cover:	22.5	20% of Total Cover:	9
Herb Stratum (Plot size: 5')			
1. *Typha latifolia* - broadleaf cattail	10	No	OBL
2. *Leersia oryzoides* - rice cutgrass	40	Yes	OBL
3. *Juncus effusus* - soft rush	30	Yes	FACW
4. *Scirpus cyperinus* - woolgrass	30	Yes	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		
50% of Total Cover:	55	20% of Total Cover:	22
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	50 x 1 =	50
FACW species	60 x 2 =	120
FAC species	0 x 3 =	0
FACU species	80 x 4 =	320
UPL species	0 x 5 =	0
Column Totals	190 (A)	490 (B)

Prevalence Index = B/A = 2.59

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	70	7.5YR 5/8	30	C	M	Clay Loam	
9-18	2.5Y 3/1	50	10YR 5/8	50	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 10.8.19

Applicant/Owner: West Virginia Department Of Highways | State: West Virginia | Sampling Point: WL8

Investigator(s): ASB, KMW | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. Toe of Slope | Local relief (concave, convex, none): concave

Slope (%): 6% | Lat 39.60859° | Long: -79.95391°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: Lb | NWI classification: 100% PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N Soil N Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N Hydrology N naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Wetland formed in drainage ditch along parking lot

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes X	No ____	Depth (inches) 2"
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes X	No ____	Depth (inches) Surface

Wetland Hydrology Present **Yes X** **No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Numerous hillside seeps

VEGETATION – Use scientific names of plants.

Sampling Point WL8

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Herb Stratum (Plot size: 5')			
1. *Typha latifolia* - broadleaf cattail	80	Yes	OBL
2. *Juncus effusus* - soft rush	10	No	FACW
3. *Solidago gigantea* – late goldenrod	5	No	FACW
4. *Erigeron philadelphicus* - Philadelphia fleabane	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of Total Cover:	50	20% of Total Cover:	20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes X** **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100	-	-	-	-	Silt Loam	
4-18	10YR 4/1	80	7.5YR 5/8	20	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2.4.19

Applicant/Owner: West Virginia Department of Highways | State: West Virginia | Sampling Point: WL1-UPL

Investigator(s): JMG/JAR | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 10% | Lat 39.60561° | Long: -79.94791°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkC | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL1-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo* - boxelder	50	Yes	FAC
2. *Prunus serotina* - black cherry	10	No	FACU
3.			
4.			
5.			
6.			
7.			
	60 = Total Cover		
50% of Total Cover:	30	20% of Total Cover:	12
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	15	Yes	FACU
2. *Rubus allegheniensis* - blackberry	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 = Total Cover		
50% of Total Cover:	10	20% of Total Cover:	4
Herb Stratum (Plot size: 5')			
1. *Verbesina alternifolia* - wingstem	20	Yes	FAC
2. *Galium aparine* - clevers	2	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	22 = Total Cover		
50% of Total Cover:	11	20% of Total Cover:	4.4
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	70 x 3 =	210
FACU species	32 x 4 =	128
UPL species	0 x 5 =	0
Column Totals	102 (A)	338 (B)

Prevalence Index = B/A = 3.313725

Hydrophytic Vegetation Indicators:

_____ 1 - Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL1-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100	-	-	-	-	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: Rock Layer

Depth (inches): 16 inches

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2/4/2019

Applicant/Owner: West Virginia Department of Highways | State: West Virginia | Sampling Point: WL2-UPL

Investigator(s): JAA, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 5-10% | Lat 39.60693° | Long: -79.94675°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkC | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL2.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL2-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina* - black cherry	30	Yes	FACU
2. *Juglans nigra* - black walnut	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	45 = Total Cover		
50% of Total Cover:	22.5	20% of Total Cover:	9
Sapling/Shrub Stratum (Plot size: 15')			
1. *Ligustrum vulgare* - common privet	15	Yes	FACU
2. *Rosa multiflora* - multiflora rose	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 = Total Cover		
50% of Total Cover:	10	20% of Total Cover:	4
Herb Stratum (Plot size: 5')			
1. *Solidago canadensis* - Canada goldenrod	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15 = Total Cover		
50% of Total Cover:	7.5	20% of Total Cover:	3
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals	80 (A)		320 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

_____ 1 - Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL2-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/4	100	-	-	-	-	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2/4/2019

Applicant/Owner: West Virginia Department of Highways | State: West Virginia | Sampling Point: WL3-UPL

Investigator(s): JAA/LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 10% | Lat 39.60879° | Long: -79.95627°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkD | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL3

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL3-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rubus occidentilas* - black raspberry	15	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 = Total Cover		
50% of Total Cover:	7.5	20% of Total Cover:	3
Herb Stratum (Plot size: 5')			
1. *Solidago canadensis* - Canada goldenrod	50	Yes	FACU
2. *Graminae species* - grass species*	20*	-	-
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		
50% of Total Cover:	25	20% of Total Cover:	10
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	0 x 3 =	0
FACU species	50 x 4 =	200
UPL species	15 x 5 =	75
Column Totals	65 (A)	275 (B)

Prevalence Index = B/A = 4.230769

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Graminae* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL3-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	100	-	-	-	-	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: Rock Layer

Depth (inches): 12 inches

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2/4/2019

Applicant/Owner: West Virginia Department of Highways | State: West Virginia | Sampling Point: WL4/5 - UPL

Investigator(s): JAA/LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): Convex

Slope (%): 5% Lat 39.60851° | Long: -79.95739°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: CkD | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL4 and WL5.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL4/5 - UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharum* - sugar maple	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		
50% of Total Cover:	20	20% of Total Cover:	8
Sapling/Shrub Stratum (Plot size: 15')			
1. *Ligustrum vulgare* - common privet	50	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
50% of Total Cover:	25	20% of Total Cover:	10
Herb Stratum (Plot size: 5')			
1. *Eutrochium maculatum - joe pye weed*	15	Yes	FACW
2. *Graminae species* - grass species*	20*	-	-
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15 = Total Cover		
50% of Total Cover:	7.5	20% of Total Cover:	3
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	15 x 2 =	30
FAC species	0 x 3 =	0
FACU species	90 x 4 =	360
UPL species	0 x 5 =	0
Column Totals	105 (A)	390 (B)

Prevalence Index = B/A = 3.714286

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Graminae* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL4/5 - UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/2	100	-	-	-	-	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: Rock Layer

Depth (inches): 16 inches

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2/4/2019

Applicant/Owner: West Virgnia Department of Highways | State: West Virginia | Sampling Point: WL6-UPL

Investigator(s): JAA/LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 15-20% | Lat 39.60714° | Long: -79.95418°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: Lb | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL6.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL6-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina* - black cherry	20	Yes	FACU
2. *Platanus occidentalis* – American sycamore	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		
50% of Total Cover:	20	20% of Total Cover:	8
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	20	Yes	FACU
2. *Berberis thunbergii* - Japanese barberry	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35 = Total Cover		
50% of Total Cover:	17.5	20% of Total Cover:	7
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	20 x 2 =	40
FAC species	0 x 3 =	0
FACU species	55 x 4 =	220
UPL species	0 x 5 =	0
Column Totals	75 (A)	260 (B)

Prevalence Index = B/A = 3.466667

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point WL6-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR3/2	100	-	-	-	-	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

____ Histosol (A1)
____ Histic Epipedon (A2)
____ Black Histic (A3)
____ Hydrogen Sulfide (A4)
____ Stratified Layers (A5)
____ 2 cm Muck (A10) **(LRR N)**
____ Depleted Below Dark Surface (A11)
____ Thick Dark Surface (A12)
____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
____ Sandy Gleyed Matrix (S4)
____ Sandy Redox (S5)
____ Stripped Matrix (S6)
____ Dark Surface (S7)
____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
____ Thin Dark Surface (S9) (**MLRA 147, 148)**
____ Loamy Gleyed Matrix (F2)
____ Depleted Matrix (F3)
____ Redox Dark Surface (F6)
____ Depleted Dark Surface (F7)
____ Redox Depressions (F8)
____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
____ Umbric Surface (F13) (**MLRA 136, 122)**
____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

____ 2 cm Muck (A10) (**MLRA 147**)
____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
____ Very Shallow Dark Surface (TF12)
____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 2/4/2019

Applicant/Owner: West Virgnia Department of Highways | State: West Virginia | Sampling Point: WL7-UPL

Investigator(s): KMW, LEM | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 15-20% | Lat 39.60583° | Long: -79.94855°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: GuC | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL7.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL7-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus serotina* - black cherry	50	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	50 = Total Cover		
50% of Total Cover:	25	20% of Total Cover:	10
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	60	Yes	FACU
2. *Ligustrum vulgare* - European privet	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
50% of Total Cover:	45	20% of Total Cover:	18
Herb Stratum (Plot size: 5')			
1. *Bryophyta species* - moss species*	40*	-	-
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	0 x 3 =	0
FACU species	140 x 4 =	560
UPL species	0 x 5 =	0
Column Totals	140 (A)	560 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

_____ 1 - Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is >50%

_____ 3 - Prevalence Index is ≤3.0[1]

_____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Bryophyta* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL7-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR3/2	100	-	-	-	-	Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 10/8/2019

Applicant/Owner: West Virgnia Department of Highways | State: West Virginia | Sampling Point: WL8-UPL

Investigator(s): ASB, KMW | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. hillslope | Local relief (concave, convex, none): convex

Slope (%): 6% | Lat 39.60881° | Long: -79.95393°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: Lb | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

Upland for WL8.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes** ____ **No X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point WL8-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Robinia pseudoacacia* – black locust	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
50% of Total Cover:	5	20% of Total Cover:	2
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	2 = Total Cover		
50% of Total Cover:	1	20% of Total Cover:	0.4
Herb Stratum (Plot size: 5')			
1. *Gramineae species* - grass species*	50*	-	-
2. *Solidago canadensis* - Canada goldenrod	10	Yes	FACU
3. *Erigeron philadelphicus* - Philadelphia fleabane	5	Yes	FACU
4. *Cirsium arvense* – Canadian thistle	2	No	FACU
5. *Trifolium pratense* – red clover	2	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	19 = Total Cover		
50% of Total Cover:	9.5	20% of Total Cover:	3.8
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	0 x 1 =	0
FACW species	0 x 2 =	0
FAC species	0 x 3 =	0
FACU species	31 x 4 =	124
UPL species	0 x 5 =	0
Column Totals	31 (A)	124 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Graminae* species could not be positively identified due to lack of distinguishing vegetative characteristics, it was not included in the hydrophytic tests

SOIL

Sampling Point WL8-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100	-	-	-	-	Silt Loam	
6-14	10YR 3/3	100	-	-	-	-	Silt Loam	0.5-2" of rocks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

- ____ Histosol (A1)
- ____ Histic Epipedon (A2)
- ____ Black Histic (A3)
- ____ Hydrogen Sulfide (A4)
- ____ Stratified Layers (A5)
- ____ 2 cm Muck (A10) **(LRR N)**
- ____ Depleted Below Dark Surface (A11)
- ____ Thick Dark Surface (A12)
- ____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ____ Sandy Gleyed Matrix (S4)
- ____ Sandy Redox (S5)
- ____ Stripped Matrix (S6)
- ____ Dark Surface (S7)
- ____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
- ____ Thin Dark Surface (S9) (**MLRA 147, 148)**
- ____ Loamy Gleyed Matrix (F2)
- ____ Depleted Matrix (F3)
- ____ Redox Dark Surface (F6)
- ____ Depleted Dark Surface (F7)
- ____ Redox Depressions (F8)
- ____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
- ____ Umbric Surface (F13) (**MLRA 136, 122)**
- ____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
- ____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

- ____ 2 cm Muck (A10) (**MLRA 147**)
- ____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ____ Very Shallow Dark Surface (TF12)
- ____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountain and Piedmont

Project/Site: Greenbag Road | City/County: City of Morgantown/ Monongalia | Sampling Date: 10/8/2019

Applicant/Owner: West Virginia Department of Highways | State: West Virginia | Sampling Point: Roadway Drainage-UPL

Investigator(s): ASB, KMW | Section, Township, Range: Morgan

Landform (hillslope, terrace, etc. roadside drainage | Local relief (concave, convex, none): concave

Slope (%): 0-2% | Lat 39.60802° | Long: -79.95441°

Subregion (LRR or MLRA): LRR Central and Eastern Mountains | Datum: North American Datum 1983 (NAD83)

Soil Map Unit Name: Lb | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No Soil No Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No Soil No Hydrology No naturally problematic? (if needed explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No X**
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Upland datapoint in drainage feature North of Greenbag Road and East of Mississippi Street

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations

Surface Water Present?	Yes ____	No X	Depth (inches) -
Water Table Present?	Yes ____	No X	Depth (inches) -
Saturation Present? (Including capillary fringe)	Yes ____	No X	Depth (inches) -

Wetland Hydrology Present **Yes X** **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Roadway Drainage-UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra* – black willow	2	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	2 = Total Cover		
50% of Total Cover:	1	20% of Total Cover:	0.4
Sapling/Shrub Stratum (Plot size: 15')			
1. *Rosa multiflora* - multiflora rose	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		
50% of Total Cover:	5	20% of Total Cover:	2
Herb Stratum (Plot size: 5')			
1. *Gramineae species* - grass species	20*	-	-
2. *Solidago canadensis* - Canada goldenrod	10	Yes	FACU
3. *Verbesina alternifolia* – wingstem	10	Yes	FAC
4. *Polygonum cuspidatum* – Japanaese knotweed	5	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25 = Total Cover		
50% of Total Cover:	12.5	20% of Total Cover:	5
Woody Vine Stratum (Plot size: 30')			
1. *Vitis species* - grape species	10*	-	-
2.			
3.			
4.			
5.			
6			
	0 = Total Cover		
50% of Total Cover:	0	20% of Total Cover:	0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	2 x 1 =	2
FACW species	0 x 2 =	0
FAC species	10 x 3 =	30
FACU species	25 x 4 =	100
UPL species	0 x 5 =	0
Column Totals	37 (A)	132 (B)

Prevalence Index = B/A = 3.567568

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1]

(Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1]

(Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

*Since the *Graminae and Vitis* species could not be positively identified due to lack of distinguishing vegetative characteristics, they were not included in the hydrophytic tests

SOIL

Sampling Point: Roadway Drainage-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators).

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100	-	-	-	-	Clay Loam	
6-18	10YR 4/4	70	-	-	-	-	Clay	Mixed matrix
	10YR 4/6	30	-	-	-	-	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators

____ Histosol (A1)
____ Histic Epipedon (A2)
____ Black Histic (A3)
____ Hydrogen Sulfide (A4)
____ Stratified Layers (A5)
____ 2 cm Muck (A10) **(LRR N)**
____ Depleted Below Dark Surface (A11)
____ Thick Dark Surface (A12)
____ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
____ Sandy Gleyed Matrix (S4)
____ Sandy Redox (S5)
____ Stripped Matrix (S6)
____ Dark Surface (S7)
____ Polyvalue Below Surface (S8) (**MLRA 147, 148)**
____ Thin Dark Surface (S9) (**MLRA 147, 148)**
____ Loamy Gleyed Matrix (F2)
____ Depleted Matrix (F3)
____ Redox Dark Surface (F6)
____ Depleted Dark Surface (F7)
____ Redox Depressions (F8)
____ Iron-Manganese Masses (F12) (**LRR N, MLRA 136)**
____ Umbric Surface (F13) (**MLRA 136, 122)**
____ Piedmont Floodplain Soils (F19) (**MLRA 148**)
____ Red Parent Material (F21)(**MLRA127,147**)

Indicators for Problematic Hydric Soils[3]:

____ 2 cm Muck (A10) (**MLRA 147**)
____ Coast Prairie Redox (A16) **(MLRA 147, 148)**
____ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
____ Very Shallow Dark Surface (TF12)
____ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed)

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

SURFACE WATER SURVEY

STREAM NAME: **STR 1 (Cobun Creek)** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA/LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
X	BOULDERS 10 IN	X	SAND
X	COBBLE (2.5-10 IN)		SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: X **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

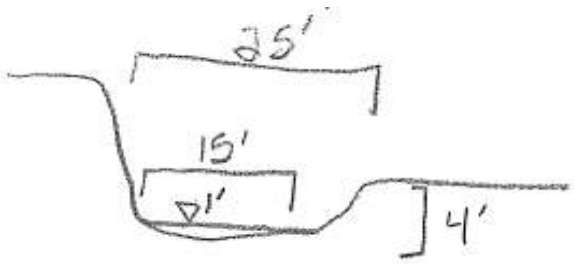
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
X	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)	X	HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES	X	FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **25'** WATER WIDTH **15'** NO WATER _____

CHANNEL DEPTH **4'** WATER DEPTH **1'**

SURFACE WATER SURVEY

STREAM NAME: **STR 2** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA, LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK	**X**	CLAY
X	BOULDERS 10 IN		SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)	**X**	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

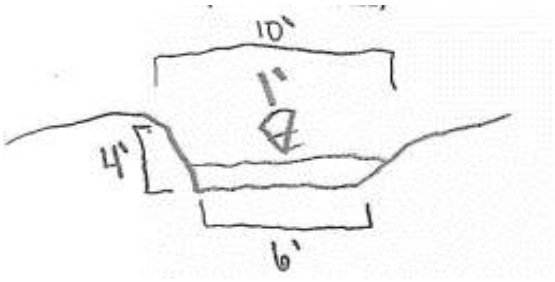
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
X	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)	**X**	HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH	**10'**	WATER WIDTH	**6'**	NO WATER	
CHANNEL DEPTH	**4'**	WATER DEPTH	**1'**		

SURFACE WATER SURVEY

STREAM NAME: **STR 3** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA, LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)		MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

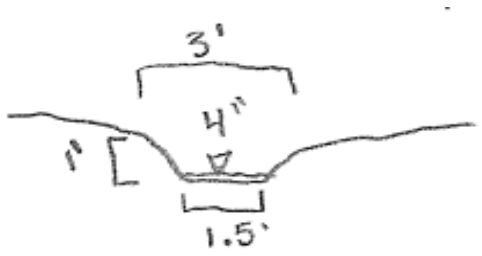
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
X	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **3'** WATER WIDTH **1.5'** NO WATER _____

CHANNEL DEPTH **1'** WATER DEPTH **4"**

SURFACE WATER SURVEY

STREAM NAME: **STR 4** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA, LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN	X	SAND
	COBBLE (2.5-10 IN)	X	SILT
X	GRAVEL (<2.5 IN)	X	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: _____ **INTERMITTENT STREAM:** X **EPHEMERAL:** _____

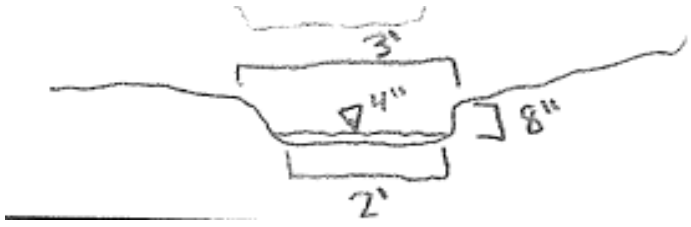
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)	X	GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **3'** WATER WIDTH **2'** NO WATER _____

CHANNEL DEPTH **8"** WATER DEPTH **4"**

SURFACE WATER SURVEY

STREAM NAME: **STR 5** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA. LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
X	BOULDERS 10 IN	X	SAND
X	COBBLE (2.5-10 IN)	X	SILT
X	GRAVEL (<2.5 IN)	X	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: X **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

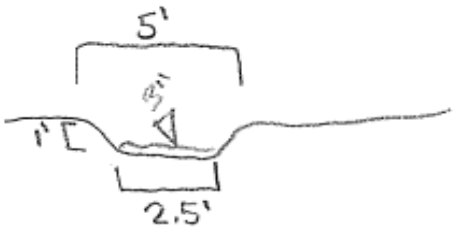
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)	X	GASTROPODA (Snail)
X	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **5'** WATER WIDTH **2.5'** NO WATER _____

CHANNEL DEPTH **1'** WATER DEPTH **3"**

SURFACE WATER SURVEY

STREAM NAME: **STR 6** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA / LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK	**X**	CLAY
	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)	**X**	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

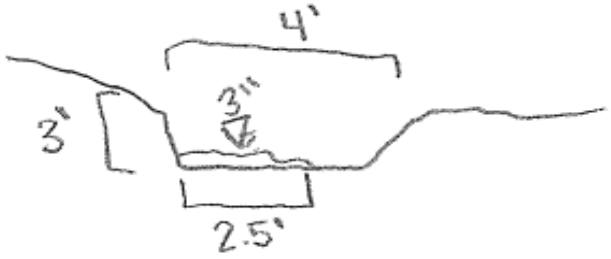
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)	**X**	HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **4'** WATER WIDTH **2.5'** NO WATER _____

CHANNEL DEPTH **3'** WATER DEPTH **3"**

SURFACE WATER SURVEY

STREAM NAME: **STR 7** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA / LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN	**X**	SAND
	COBBLE (2.5-10 IN)	**X**	SILT
	GRAVEL (<2.5 IN)	**X**	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

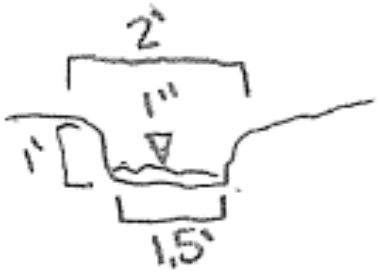
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)	**X**	PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH	**2'**	WATER WIDTH	**1.5'**	NO WATER	
CHANNEL DEPTH	**1'**	WATER DEPTH	**1"**		

SURFACE WATER SURVEY

STREAM NAME: **STR 8** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: JAA / LEM

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)	**X**	MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: _____ **INTERMITTENT STREAM:** **X** **EPHEMERAL:** _____

MACROINVERTEBRATES:

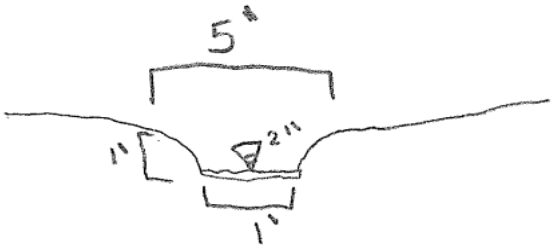
	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

*AMD Discharge

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **5'** WATER WIDTH **1'** NO WATER _____

CHANNEL DEPTH **1'** WATER DEPTH **2"**

SURFACE WATER SURVEY

STREAM NAME: **STR 9** PROJECT: Greenbag Road

DRAINAGE BASIN: **Coburn Creek** INVESTIGATORS: JMG / JAR

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN		SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

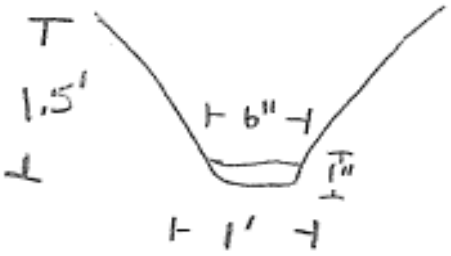
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
X	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **1'** WATER WIDTH **6"** NO WATER _____

CHANNEL DEPTH **1.5'** WATER DEPTH **1"**

SURFACE WATER SURVEY

STREAM NAME: **STR 10 (US Point)** PROJECT: Greenbag Road

DRAINAGE BASIN: **Aaron Creek** INVESTIGATORS: JMG/JAR

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
X	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)		SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

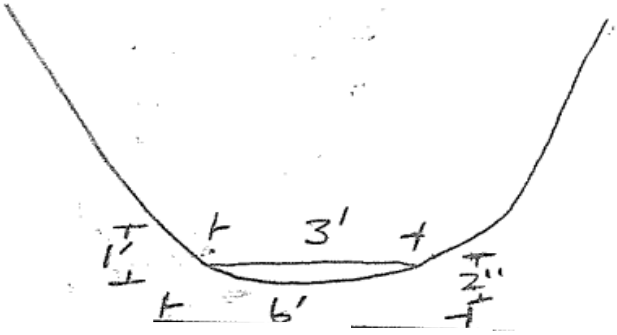
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)	**X**	GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **6'** WATER WIDTH **3'** NO WATER _____

CHANNEL DEPTH **1'** WATER DEPTH **2"**

SURFACE WATER SURVEY

STREAM NAME: **STR 10 (DS Point)** PROJECT: Greenbag Road

DRAINAGE BASIN: **Aaron Creek** INVESTIGATORS: JMG/JAR

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

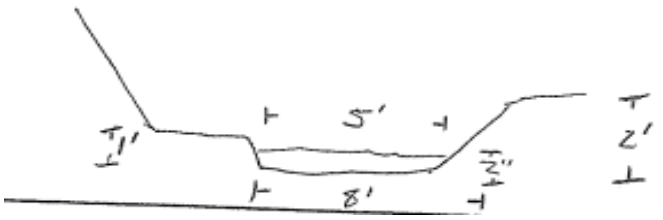
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH	**8'**	WATER WIDTH	**5'**	NO WATER	_____
CHANNEL DEPTH	**LB=1'**	WATER DEPTH	**2"**		
	RB=2'				

SURFACE WATER SURVEY

STREAM NAME: **STR 11** PROJECT: Greenbag Road

DRAINAGE BASIN: **Aaron Creek** INVESTIGATORS: JMG/JAR

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
X	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)	**X**	SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

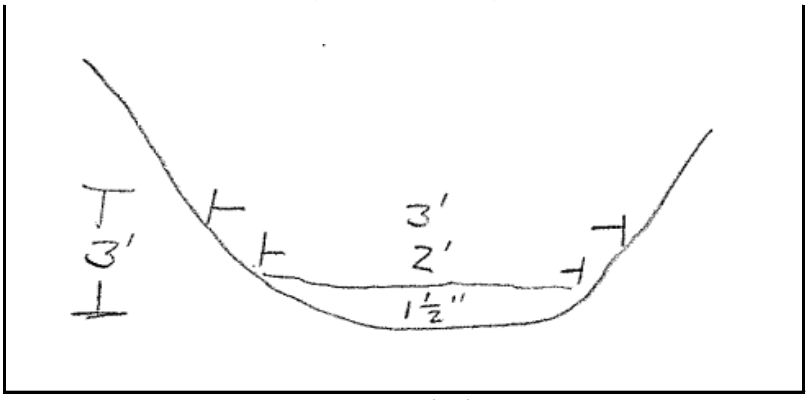
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)	**X**	GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **3'** WATER WIDTH **2'** NO WATER _____

CHANNEL DEPTH **3'** WATER DEPTH **1.5"**

SURFACE WATER SURVEY

STREAM NAME: **STR 12 (Aaron Creek)** PROJECT: Greenbag Road

DRAINAGE BASIN: **Aaron Creek** INVESTIGATORS: JMG/JAR

DATE: 2.4.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK		CLAY
X	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)		SILT
X	GRAVEL (<2.5 IN)		MUCK
	DETRITUS		OTHER

PERENNIAL STREAM: **X** **INTERMITTENT STREAM:** _____ **EPHEMERAL:** _____

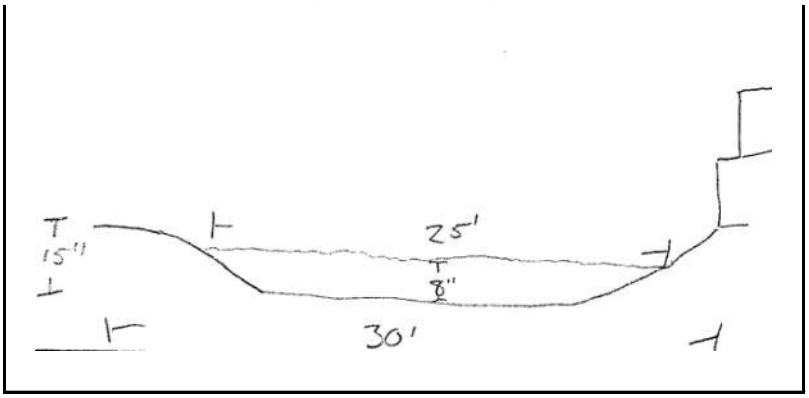
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
X	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)		PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH **30'** WATER WIDTH **25'** NO WATER _____

CHANNEL DEPTH **15"** WATER DEPTH **8"**

SURFACE WATER SURVEY

STREAM NAME: **STR 13** PROJECT: Greenbag Road

DRAINAGE BASIN: **Cobun Creek** INVESTIGATORS: ASB/KMW

DATE: 10.8.19

PHYSICAL PARAMETERS:

SUBSTRATE TYPES:

	BEDROCK	**X**	CLAY
X	BOULDERS 10 IN	**X**	SAND
X	COBBLE (2.5-10 IN)		SILT
X	GRAVEL (<2.5 IN)		MUCK
X	DETRITUS		OTHER

PERENNIAL STREAM: _____ **INTERMITTENT STREAM:** **X** **EPHEMERAL:** _____

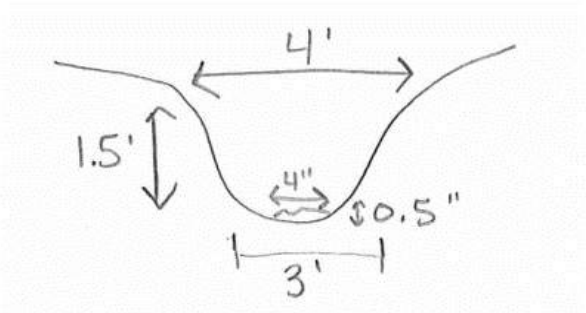
MACROINVERTEBRATES:

	EPHEMEROPTERA (Mayfly)		LEPIDOPTERA (Moth)
	NEUROPTERA (lacewings)		AMPHIPODA (Scud)
X	TRICHOPTERA (Caddisfly)		COLEOPTERA (Water Penny)
	PLECOPTERA (Stonefly)		MEGALOPTERA (Hellgrammite)
	HEMIPTERA (Leafhoppers)		GASTROPODA (Snail)
	DIPTERA (True Fly)	**X**	PLANARIIDAE (Flatworm)
	ODONATA (Dragonfly, Damselfly)		HIRUDINEA (Leech)
	ISOPODA (Sowbug)		BIVALVIA (Molluscs)
	DECAPODA (Crayfish)		HYDRACHNIDIA (Mites)
	NO MACRONIVERTEBRATES		FIN FISH

CROSS SECTIONAL DIAGRAM

(NOT TO SCALE)

LEFT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)



RIGHT DESCENDING BANK (FT) (include primary and secondary banks in the drawing)

WIDTH (FT)

(TOP OF BANK TO TOP OF BANK)

BANK WIDTH	**4'**	WATER WIDTH	**4"**	NO WATER	
CHANNEL DEPTH	**1.5'**	WATER DEPTH	**0.5"**		

APPENDIX C
Wetland and Stream Function Evaluation Forms

Wetland Function Evaluation Form

WETLAND I.D. WL1 Prepared by: JMG / JAR Date: 2/04/2019

Latitude: 39.60577° Longitude: -79.94769°

Total area of wetland: 0.52 acres Watershed Size: - Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 90 feet Contiguous undeveloped buffer zone present N/A

Is wetland disturbed? No Type of Disturbance: N/A

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Hill Slope Water Source: Groundwater, Stream Overflow Hydrodynamics: Seasonal Saturation, Intermittently Flooded

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: 75% PEM / 25% PFO

How many tributaries contribute to the wetland? 1

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	7,13		Hillside seep, some opportunity for groundwater discharge
Floodflow Alteration		X	5,9,10,14		Floodplain provides some opportunity for flood flow alteration
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	9,10,13,14		Wetland receives hillside runoff
Nutrient Removal		X	12		Wetland receives hillside runoff which may carry excess nutrients

Production Export		X	1,4		Heavy wildlife usage.
Sediment/Shoreline Stabilization	X				
Wildlife Habitat (B, W, M)		X	1,3,4,5,8,16,17,19		Deer scat and tracks observed within wetland.
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Hillside seep type wetland

75% PEM / 25% PFO

Wetland Function Evaluation Form

WETLAND I.D. WL2 Prepared by: JAA, LEM Date: 2/4/2019

Latitude: 39.60708° Longitude: -79.94683°

Total area of wetland: 0.048 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 35 feet Contiguous undeveloped buffer zone present: No

Is wetland disturbed? No Type of Disturbance: N/A

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Valley Water Source: Hillside runoff, Stream Overflow Hydrodynamics: Seasonal Saturation

Adjacent Land Use: Commercial/ Residential Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: 70% PEM / 30% PSS

How many tributaries contribute to the wetland?: 1

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	7		Floodplain wetland provides some opportunity for groundwater discharge
Floodflow Alteration		X	5,6,18		Floodplain and scrub-shrub vegetation provide opportunity for floodflow alteration.
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,2,4		Wetland receives roadway runoff stream flood flow provides opportunity for sediment / toxicant retention
Nutrient Removal		X	3		Stream flood flow provides opportunity for nutrient removal

Production Export		X	2		Heavy wildlife usage
Sediment/Shoreline Stabilization		X	15		Dense Vegetation
Wildlife Habitat (B, W, M)		X	16		Deer scat observed within wetland
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Floodplain type wetland

70% PEM / 30% PSS

Wetland Function Evaluation Form

WETLAND I.D. WL3 Prepared by: JAA, LEM Date: 2/4/2019

Latitude: 39.60891° Longitude: -79.95631°

Total area of wetland: 0.039 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"?: No

Distance to nearest roadway or other development 50 feet Contiguous undeveloped buffer zone present: No

Is wetland disturbed? No Type of Disturbance: -

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Hillslope Water Source: Hillside runoff, Groundwater Hydrodynamics: Seasonal Saturation and Flooding

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: 100% PEM

How many tributaries contribute to the wetland? 1 (during high flow events—in floodplain associated with Cobun Creek)

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge	X				
Floodflow Alteration		X	5,9		Wetland contains hydric soils and provides opportunity to receive and detain overland flow from surrounding uplands,
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,2,5,10		Wetland receives roadway runoff and provides opportunity for sediment / toxicant retention
Nutrient Removal		X	3,4		Wetland receives roadway runoff which may provide an opportunity for the wetland to receive excess nutrients.

Production Export		X	1,2,4		Deer scat was observed within the wetland
Sediment/Shoreline Stabilization	X				
Wildlife Habitat (B, W, M)		X	8,17		Deer scat and tracks were observed within wetland
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Hillslope type wetland

100% PEM

Wetland Function Evaluation Form

WETLAND I.D. WL4 Prepared by: JAA, LEM Date: 2/4/2019

Latitude: 39.60851° Longitude: -79.95849°

Total area of wetland: 0.041 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 10 feet Contiguous undeveloped buffer zone present No

Is wetland disturbed? Yes Type of Disturbance Roadside ditch

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? N/A

Geomorphic Setting: Hillslope Water Source: Roadway Runoff / Groundwater Hydrodynamics: Seasonal Saturation

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: PEM

How many tributaries contribute to the wetland? 0

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	15		Wetland shows signs of variable water levels.
Floodflow Alteration	X				
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,15,16		Wetland receives and detains roadway runoff, which potentially carries sediments and/or toxicants; Wetland has a high degree of water and vegetation interspersion; Dense vegetation provides opportunity for sediment trapping.

Nutrient Removal		X	3		Wetland receives roadway runoff which may provide an opportunity for the wetland to receive excess nutrients.
Production Export		X	1,2,4		Rabbit scat observed in wetland
Sediment/Shoreline Stabilization	X				
Wildlife Habitat (B, W, M)		X	17,23		Rabbit scat observed in wetland
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Hillslope/Roadway drainage ditch type wetland

100% PEM

Wetland Function Evaluation Form

WETLAND I.D. WL5 Prepared by: JAA, LEM Date: 2/4/2019

Latitude: 39.60851° Longitude: -79.95754°

Total area of wetland: 0.0072 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 15 feet Contiguous undeveloped buffer zone present No

Is wetland disturbed? Yes Type of Disturbance Roadside ditch

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Hillslope Water Source: Roadway Runoff / Groundwater Hydrodynamics: Seasonal Saturation

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: PEM

How many tributaries contribute to the wetland? 0

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	15		Wetland shows signs of variable water levels.
Floodflow Alteration	X				
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,15,16		Wetland receives and detains roadway runoff, which potentially carries sediments and/or toxicants; Wetland has a high degree of water and vegetation interspersion; Dense vegetation provides opportunity for sediment trapping.

Nutrient Removal		X	3		Near roadway, may trap sediment laden runoff. Wetland receives roadway runoff which may provide an opportunity for the wetland to receive excess nutrients.
Production Export		X	1,2,4		Rabbit scat observed
Sediment/Shoreline Stabilization	X				
Wildlife Habitat (B, W, M)		X	17,23		Rabbit habitat and scat observed
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Hillslope type wetland

100% PEM

Wetland Function Evaluation Form

WETLAND I.D. WL6 Prepared by: JAA, LEM Date: 2/4/2019

Latitude: 39.60689° Longitude: -79.95393°

Total area of wetland: 0.299 Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 40 feet Contiguous undeveloped buffer zone present No

Is wetland disturbed? No Type of Disturbance N/A

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Floodplain Water Source: Stream Overflow / Groundwater Hydrodynamics: Seasonal Saturation, Intermittently Flooded

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: 80% PFO / 20% PEM

How many tributaries contribute to the wetland? 1

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	4,7		Gravel or sandy soils present in or adjacent to the wetland. Wetland is associated with a perennial watercourse (Cobun Creek).
Floodflow Alteration		X	5,8,9		Forested floodplain wetland provides opportunity for flood flow alteration
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,16		Wetland receives roadway runoff and stream overflow which provides opportunity for sediment / toxicant retention
Nutrient Removal		X	3,9		Wetland receives roadway runoff and stream overflow which provides opportunity for nutrient removal

Production Export		X	1,2,4		Heavy wildlife usage, animal tracks observed within wetland
Sediment/Shoreline Stabilization		X	3,4,15		Vegetation provides shoreline stabilization for Cobun Creek
Wildlife Habitat (B, W, M)		X	17,19		Deer scat, wetland provides opportunity for travel corridor and wildlife habitat
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Floodplain type wetland

80% PFO / 20% PEM

Wetland Function Evaluation Form

WETLAND I.D. WL7 Prepared by: KMW, LEM Date: 3/26/19

Latitude: 39.60579° Longitude: -79.94837°

Total area of wetland: 0.228 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? No Is wetland part of a wildlife corridor? Yes Or a "habitat island"? No

Distance to nearest roadway or other development 10 feet Contiguous undeveloped buffer zone present No

Is wetland disturbed? No Type of Disturbance -

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting: Hillslope Water Source: Groundwater, Roadway Runoff Hydrodynamics: Seasonal Saturation

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: 75% PEM / 25% PFO

How many tributaries contribute to the wetland? -

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	4,8,13,15		Multiple hillside springs of groundwater seeps observed within this wetland
Floodflow Alteration		X	5,8,9,10		Hillslope wetland fed by seep/transitions to floodplain wetland
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,2,10		Opportunity for wetland to receive and detain roadway runoff and stream overflow which may carry sediments or toxicants.
Nutrient Removal		X	3,4,5,10		Wetland receives roadway runoff and stream overflow which may carry excess nutrients.

Production Export		X	1,2,4		Heavy wildlife usage, animal scat observed within wetland
Sediment/Shoreline Stabilization		X	1,2,3,4		Dense vegetation provides shoreline stabilization
Wildlife Habitat (B, W, M)		X	8,13,16,17		Deer tracks observed within wetland indicates wildlife travel corridor.
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Flood terrace type wetland

75% PEM / 25% PFO

Wetland Function Evaluation Form

WETLAND I.D. WL8 Prepared by: KMW, ASB Date: 10/8/19

Latitude: 39.60859° Longitude: -79.95391°

Total area of wetland: 0.07 acres Watershed Size: N/A Name of Watershed/drainage basin: Cobun Creek

Human made? Yes Is wetland part of a wildlife corridor? No Or a "habitat island"? No

Distance to nearest roadway or other development 9 feet Contiguous undeveloped buffer zone present No

Is wetland disturbed? Yes Type of Disturbance Parking lot ditch

Is wetland hydrologically Isolated? No If not, where does the wetland lie in the drainage basin? Lower Portions

Geomorphic Setting Toe of slope Water Source: Hillside seep, parking lot runoff Hydrodynamics: Seasonal Saturation

Adjacent Land Use: Transportation Wetland Impact: N/A Area: N/A

Is wetland designated as EV? No Dominant Cowardin Classification: PEM

How many tributaries contribute to the wetland? -

Evaluation based on:

Office Field X Corps manual wetland delineation completed? Yes X No

Function	Occurrence N	Occurrence Y	Rationale (Reference #)	Principal Function(s)	Comments
Groundwater Recharge/Discharge		X	10,13		Stormwater outlet; groundwater/hillside seeps observed.
Floodflow Alteration		X	3,4,5,7,18		Wetland provides opportunity for floodflow alteration as it is bounded by a parking lot and is downgradient of residential development
Fish and Shellfish Habitat	X				No permanent open water
Sediment/Toxicant Retention		X	1,2		Opportunity for wetland to receive and detain parking lot runoff which may carry sediments or toxicants.
Nutrient Removal		X	3,4,5,8,9		Wetland detains parking lot runoff, and runoff from up-gradient housing development, which potentially carries excess nutrients

Production Export		X	4,7		Deer trails and scat observed within wetland
Sediment/Shoreline Stabilization	X				
Wildlife Habitat (B, W, M)		X	13,17		Deer trails and scat observed within wetland
Recreation	X				
Educational/Scientific Value	X				
Uniqueness/Heritage	X				
Visual Quality/Aesthetics	X				
Endangered Species Habitat	X				

Notes:

Stormwater drainage feature wetland

100% PEM

Ver. 9-21-17

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2015).

Project Name: Greenbag Road Improvement Project
Location: STR 1 (Cobun Creek)
Sampling Date: 3/13/19

Project Site: Before Project

SAR number: 1

Enter Results in Section A of the Mitigation Sufficiency Calculator

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.42
Biogeochemical Cycling	0.35
Habitat	0.55

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canopy over channel.	3.00	0.00
V_{EMBED}	Average embeddedness of channel.	2.98	0.71
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	3.00	0.86
$V_{BANKSTAB}$	Weighted lengths of erosion by class	87.68	0.14
V_{LWD}	Number of down woody stems per 100 feet of stream.	35.33	0.71
V_{TDBH}	Average dbh of trees.	10.20	1.00
V_{TDEN}	Average Density of Trees	328.13	0.68
V_{CVALUE}	Average Coefficient of Conservatism of riparian species.	4.00	0.91
V_{FOREST}	Percent forest cover for Catchment.	80.00	0.90

Version 9-21-17

Low-Gradient Perennial Streams in Appalachia
Field Data Sheet and Calculator

Assessment Team:	Markosky	Latitude/UTM Northing:	39.60819°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95543°
Location:	STR 1 (Cobun Creek)	Sampling Date:	3/13/19

SAR Number: 1 Thalweg Length (ft): 300 (300 ft suggested minimum)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure for all streams, even if cover is less than 20%.

3.0 %

List the percent cover measurements at each point below (between 0 and 100):

10	0	0	5	0	15	0	0	0	0

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 60 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.98

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment **(or bedrock)**
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment **(or artificial surface)**

List the ratings at each point below:

3	2	1	1	1	5	2	4		
1	1	1	3	4	5	4	3		
1	1	2	5	4	3	5	5		
1	1	5	5	4	5	3	2		
1	3	5	4	3	4	5	4		
1	1	5	2	5	4	1	3		
3	1	4	4	5	5	1	2		
2	4	1	4	3	3	2			

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 60 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

3.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.75	1.25	4.00	0.08	0.08	5.50	5.00	5.50		
1.00	0.50	4.50	2.50	0.75	5.00	3.50	3.00		
4.25	0.25	3.50	3.50	3.00	5.00	0.08	4.00		
4.00	1.50	1.00	6.00	2.00	2.50	6.00	5.00		
1.50	1.25	1.50	2.00	2.00	3.50	6.00	4.00		
1.50	1.60	1.75	2.25	3.00	4.00	4.00	2.00		
3.25	3.00	1.00	1.75	5.00	3.50	3.00	1.50		
0.75	3.00	0.08	0.50	5.00	4.00	3.00			

4 $V_{BANKSTAB}$ This variable is an index incorporating three elements of bank stability: 1) bank erosion length, 2) height category of eroded bank (0.1–2 ft, 2.1–4 ft, >4 ft, or artificial stabilization), and 3) length of artificial stream bank stabilization. Measure the length of the SAR along the thalweg, and enter at the top of the page. Record the length of each eroded area, using the drop down menus to select erosion class. Measure erosion on both sides of the stream. Index ranges from 0 to 200.

87.7

☐ Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft): 300

Total Weighted Erosion length (ft): 263.05

Left Stream Bank				Right Stream Bank			
Height of Erosion Category	Height Index	Length	Contri-bution	Height of Erosion Category	Height Index	Length	Contri-bution
1) 0.1 - 2 ft.	0.5	28 ft	14.0 ft	2) 2.1 - 4 ft.	0.7	82 ft	57.4 ft
4) Artificial Bank	0.5	20 ft	10.0 ft	4) Artificial Bank	0.5	25 ft	12.3 ft
1) 0.1 - 2 ft.	0.5	50 ft	25.0 ft	1) 0.1 - 2 ft.	0.5	34 ft	17.0 ft
4) Artificial Bank	0.5	18 ft	9.0 ft	4) Artificial Bank	0.5	13 ft	6.5 ft
2) 2.1 - 4 ft.	0.7	34 ft	23.8 ft				
4) Artificial Bank	0.5	25 ft	12.5 ft				
3) >4 ft.	1.0	63 ft	63.0 ft				
2) 2.1 - 4 ft.	0.7	18 ft	12.6 ft				
Left Bank Erosion length:		256 ft		Right Bank Erosion length:		154 ft	

Sample Variable 5 within the entire riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page.

35.3

Number of downed woody stems: 106

Sample Variable 6-8 within at least four 0.032-acre (21' radius) plots within the riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

6 V_{TDBH} Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

10.20 in

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☐ Plot Used ☐ No Trees		☐ Plot Used ☐ No Trees	
13	12	15		8	16	9.5					
6	4.5	16		26	7.5	9					
8	13	4.5		11.5	15	10					
14	8.5	6		6.5	4.5	6					
11.5	4.5	26		9	6.5						
6				14	4.5						
7				11	9						
8					5						
8					10						
5											
8.5											
6											
Plot Average		Plot Average		Plot Average		Plot Average		Plot Average		Plot Average	
8.44 in.		13.50 in.		10.25 in.		8.63 in.					

7	V_{TDEN}	Tree density, based on trees recorded for V_{TDBH} in four to six 0.032-acre plots. At least four plots must be used.	328.1
8	V_{CVALUE}	Coefficient of conservatism. The average published Coefficients of Conservatism for all native trees and all non-natives in any strata. Coefficients of Conservatism range from 0 (non-natives) to 10 (natives with high fidelity to a specific habitat). Use Drop down menus to select species, once per species. Non-natives are recorded if they occur anywhere in the riparian/buffer zone	4.00

Native Trees				Non-Natives in Any Strata			
Species	C-Value	Species	C-Value	Species	C-Value	Species	C-Value
Acer rubrum	3			*Rosa multiflora*	0		
Prunus serotina	3						
Quercus rubra	6						
Liquidambar styraciflu	5						
Fraxinus americana	5						
Carya ovata	6						

Sample Variable 9 within the entire catchment of the SAR.

9	V_{FOREST}	Percent cover of forested area within the entire watershed that provides water to the perennial stream. Using GIS or aerial photos, enter the estimated percent cover of forest directly, or the acreage of the entire watershed and then the acreage of forested area, below (direct measure will take precedence if both are entered) .	80.0 %

Estimated percent cover of forest in the catchment of the SAR: 80.0 %

OR

Estimated acreage for the catchment of the SAR:

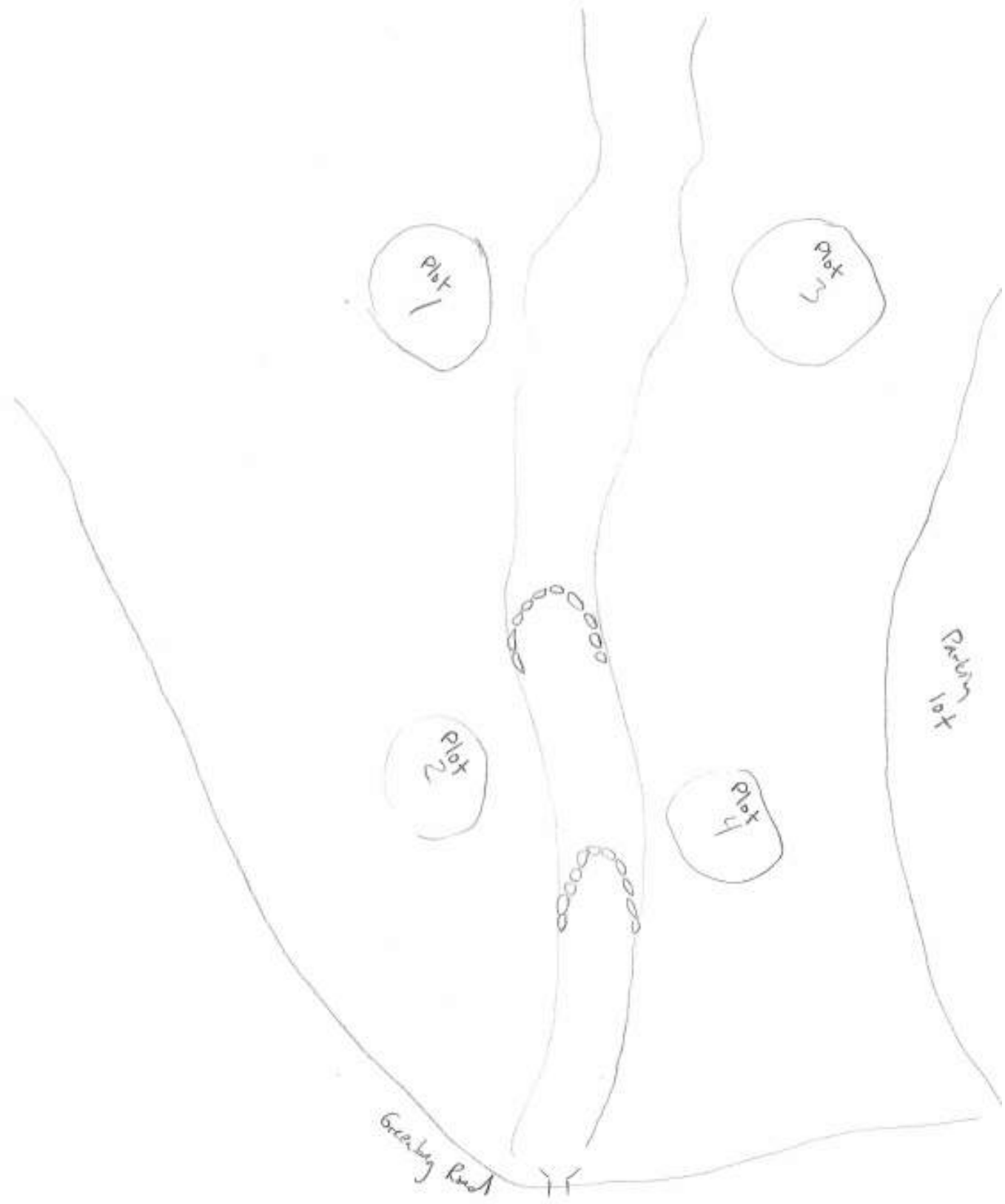
Estimated acreage of forest in the catchment of the SAR:

Summary: SAR Number 1

Variable	Value	VSI
$V_{CCANOPY}$	3 %	0.00
V_{EMBED}	3.0	0.71
$V_{SUBSTRATE}$	3.00 in	0.86
$V_{BANKSTAB}$	88 %	0.14
V_{LWD}	35.3	0.71
V_{TDBH}	10.2 in	1.00
V_{TDEN}	328.1 /ac	0.68
V_{CVALUE}	4.00	0.91
V_{FOREST}	80.0 %	0.90

Notes:

Add Notes and a Site Sketch in this space:



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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 2
Sampling Date: 3/13/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.62
Biogeochemical Cycling	0.76
Habitat	0.82

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	93.50	1.00
V_{EMBED}	Average embeddedness of channel.	3.13	0.87
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	3.38	1.00
V_{BERO}	Total percent of eroded stream channel bank.	1.75	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	18.00	1.00
V_{TDBH}	Average dbh of trees.	9.15	1.00
V_{SNAG}	Number of snags per 100 feet of stream.	6.00	0.70
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	91.25	1.00
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.30	0.32

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60988°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95754°
Location:	STR 2	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

93.5 %

List the percent cover measurements at each point below:

100	90	80	70	100	100	95	100	100	100

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

3.1

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	2	5	1	4	4				
5	5	4	1	5	4				
3	1	3	1	4	3				
4	5	2	1	2	3				
2	4	3	3	3	4				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

3.38 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.50	5.50	5.25	5.00	1.75	1.75				
3.50	2.25	6.00	4.50	0.75	3.00				
5.50	0.08	10.00	0.08	5.75	2.50				
3.25	2.50	3.75	0.08	5.00	3.00				
6.00	4.50	3.25	4.00	3.75	1.00				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

2 %

Left Bank: 2 ft Right Bank:

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated.

Number of downed woody stems: 18

18.0

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

9.2

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
8	6				18	7			
14					17	11			
14					6	7			
9					11	10.5			
5					11				
12					5				
8					7.5				
5					4.5				
6					8				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated.

Left Side: 4 Right Side: 2

6.0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated.

Left Side: Right Side:

Not Used

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.

0.00

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☑	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☑	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						
1	Species in Group 1			2	Species in Group 2		

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

91.25 %

Left Side				Right Side			
90	90	100	80	100	100	90	80

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: **0.30**

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	32	32
Impervious areas (parking lots, roofs, driveways, etc)	0	31	63
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	37	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	94 %	1.00
V_{EMBED}	3.1	0.87
$V_{SUBSTRATE}$	3.38 in	1.00
V_{BERO}	2 %	1.00
V_{LWD}	18.0	1.00
V_{TDBH}	9.2	1.00
V_{SNAG}	6.0	0.70
V_{SSD}	Not Used	Not Used
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	91.3 %	1.00
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.3	0.32

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 3
Sampling Date: 3/13/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.36
Biogeochemical Cycling	0.43
Habitat	0.33

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	29.00	0.22
V_{EMBED}	Average embeddedness of channel.	2.73	0.72
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	1.63	0.81
V_{BERO}	Total percent of eroded stream channel bank.	0.00	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	0.00	0.00
V_{TDBH}	Average dbh of trees.	5.25	0.34
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	2.00	0.95
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	8.75	0.11
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.34	0.36

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.61035°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95592°
Location:	STR 3	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

29.0 %

List the percent cover measurements at each point below:

0	0	0	0	0	0	0	100	90	100

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.7

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

4	3	1	1	2	5				
1	5	1	3	2	4				
4	1	1	3	2	5				
1	1	1	4	4	5				
3	1	5	5	2	2				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

1.63 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.75	3.00	0.75	0.08	2.50	2.25				
0.08	1.75	2.50	1.00	3.75	2.75				
6.00	8.00	1.00	0.75	0.50	1.25				
2.50	7.50	0.80	1.50	1.50	2.00				
3.75	1.25	0.75	1.25	3.00	3.50				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

0 %

Left Bank: 0 ft Right Bank: 0 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5	V_{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. Number of downed woody stems: 0	0.0
6	V_{TDBH}	Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.	5.3
7	V_{SNAG}	Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. Left Side: 0 Right Side: 0	0.0
8	V_{SSD}	Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. Left Side: Right Side:	Not Used
9	V_{SRICH}	Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.	2.00

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
					5				
					5.5				

Group 1 = 1.0

☑	*Acer rubrum*	☐	*Magnolia tripetala*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*
☐	*Asimina triloba*	☑	*Prunus serotina*
☐	*Betula alleghaniensis*	☐	*Quercus alba*
☐	*Betula lenta*	☐	*Quercus coccinea*
☐	*Carya alba*	☐	*Quercus imbricaria*
☐	*Carya glabra*	☐	*Quercus prinus*
☐	*Carya ovalis*	☐	*Quercus rubra*
☐	*Carya ovata*	☐	*Quercus velutina*
☐	*Cornus florida*	☐	*Sassafras albidum*
☐	*Fagus grandifolia*	☐	*Tilia americana*
☐	*Fraxinus americana*	☐	*Tsuga canadensis*
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*
☐	*Magnolia acuminata*		

2 Species in Group 1

Group 2 (-1.0)

☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
		☐	*Microstegium vimineum*
☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Elaeagnus umbellata*	☐	*Rosa multiflora*
☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Ligustrum obtusifolium*		
☐	*Ligustrum sinense*		

0 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

8.75 %

Left Side				Right Side			
0	0	0	50	0	0	0	20

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.34

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	39	39
Impervious areas (parking lots, roofs, driveways, etc)	0	28	67
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	33	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	29 %	0.22
V_{EMBED}	2.7	0.72
$V_{SUBSTRATE}$	1.63 in	0.81
V_{BERO}	0 %	1.00
V_{LWD}	0.0	0.00
V_{TDBH}	5.3	0.34
V_{SNAG}	0.0	0.10
V_{SSD}	Not Used	Not Used
V_{SRICH}	2.00	0.95
$V_{DETRITUS}$	8.8 %	0.11
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.34	0.36

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 4
Sampling Date: 3/13/19

Project Site | Before Project

Subclass for this SAR:
Intermittent Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.40
Biogeochemical Cycling	0.57
Habitat	0.68

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	92.50	1.00
V_{EMBED}	Average embeddedness of channel.	2.33	0.58
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	1.88	0.94
V_{BERO}	Total percent of eroded stream channel bank.	80.00	0.65
V_{LWD}	Number of down woody stems per 100 feet of stream.	3.00	0.38
V_{TDBH}	Average dbh of trees.	8.71	1.00
V_{SNAG}	Number of snags per 100 feet of stream.	1.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	83.13	1.00
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.30	0.32

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60975°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95728°
Location:	STR 4	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Intermittent Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

92.5 %

List the percent cover measurements at each point below:

100	80	100	70	90	100	100	95	100	90

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.3

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

1	3	3	1	1	1				
1	5	5	1	1	1				
3	5	4	1	1	1				
4	5	5	1	1	1				
3	5	3	1	1	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

1.88 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

0.80	4.00	3.00	3.25	0.80	0.80				
0.80	6.50	4.00	2.25	0.80	0.80				
6.00	3.00	2.25	1.50	0.80	0.80				
3.00	4.00	2.50	0.80	0.80	0.80				
3.00	6.50	3.25	0.80	0.80	0.80				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

80 %

Left Bank: 30 ft Right Bank: 50 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5	V_{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. Number of downed woody stems: 3	3.0
6	V_{TDBH}	Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.	8.7
7	V_{SNAG}	Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. Left Side: 0 Right Side: 1	1.0
8	V_{SSD}	Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. Left Side: Right Side:	Not Used
9	V_{SRICH}	Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.	0.00

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
11.5					5				
12					12				
13					6				
10					6				
8.5					7				
8					5				
					8				
					10				

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☑	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						
1	Species in Group 1			1	Species in Group 2		

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

83.13 %

Left Side				Right Side			
100	20	80	75	100	100	100	90

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: 0.30

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	32	32
Impervious areas (parking lots, roofs, driveways, etc)	0	31	63
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	37	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	93 %	1.00
V_{EMBED}	2.3	0.58
$V_{SUBSTRATE}$	1.88 in	0.94
V_{BERO}	80 %	0.65
V_{LWD}	3.0	0.38
V_{TDBH}	8.7	1.00
V_{SNAG}	1.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	83.1 %	1.00
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.3	0.32

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 5
Sampling Date: 3/13/19

Project Site | Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.60
Biogeochemical Cycling	0.73
Habitat	0.56

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	30.00	0.23
V_{EMBED}	Average embeddedness of channel.	2.87	0.77
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	1.13	0.56
V_{BERO}	Total percent of eroded stream channel bank.	111.00	0.48
V_{LWD}	Number of down woody stems per 100 feet of stream.	17.00	1.00
V_{TDBH}	Average dbh of trees.	9.44	1.00
V_{SNAG}	Number of snags per 100 feet of stream.	3.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	1.80	0.86
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	61.25	0.75
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.43	0.45

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60845°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95579°
Location:	STR 5	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

30.0 %

List the percent cover measurements at each point below:

0	10	30	50	20	60	40	40	30	20

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.9

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	5	4	2	3	3				
5	5	1	1	2	2				
5	5	1	2	1	1				
4	1	1	3	3	4				
5	4	3	5	1	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

1.13 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.50	2.00	1.75	1.00	2.50	2.00				
3.50	4.25	0.80	0.80	0.80	0.80				
2.00	5.00	0.80	0.25	0.25	0.75				
1.25	0.80	0.80	1.25	0.80	2.00				
1.75	2.50	0.25	1.75	1.00	0.80				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

111 %

Left Bank: 52 ft Right Bank: 59 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **17.0**

Number of downed woody stems: 17

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **9.4**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
					8	9	11		
					6	7	11.5		
					10.5	11	7		
					5	13	7		
					15	15	23		
					12	5	5		
					8	4.5	6		
					10	14	7		
					6	9			

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **3.0**

Left Side: 0 Right Side: 3

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **1.80**

Group 1 = 1.0				Group 2 (-1.0)			
☑	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☑	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☑	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

3 Species in Group 1

1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

61.25 %

Left Side				Right Side			
10	70	40	20	100	100	100	50

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.43

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	59	59
Impervious areas (parking lots, roofs, driveways, etc)	0	31	90
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	10	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	30 %	0.23
V_{EMBED}	2.9	0.77
$V_{SUBSTRATE}$	1.13 in	0.56
V_{BERO}	111 %	0.48
V_{LWD}	17.0	1.00
V_{TDBH}	9.4	1.00
V_{SNAG}	3.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	1.80	0.86
$V_{DETRITUS}$	61.3 %	0.75
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.43	0.45

Notes:

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 6
Sampling Date: 3/13/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.38
Biogeochemical Cycling	0.47
Habitat	0.45

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	48.00	0.47
V_{EMBED}	Average embeddedness of channel.	2.13	0.51
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	0.63	0.31
V_{BERO}	Total percent of eroded stream channel bank.	107.00	0.50
V_{LWD}	Number of down woody stems per 100 feet of stream.	16.00	1.00
V_{TDBH}	Average dbh of trees.	13.83	1.00
V_{SNAG}	Number of snags per 100 feet of stream.	2.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	28.13	0.34
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.09	0.09

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60643°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95267°
Location:	STR 6	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

48.0 %

List the percent cover measurements at each point below:

0	0	0	0	0	100	90	100	90	100

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.1

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	5	3	1	3	3				
2	1	4	2	2	2				
1	1	1	1	2	5				
1	1	1	4	3	1				
4	1	1	2	2	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

0.63 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.00	3.25	0.25	0.08	2.00	1.75				
0.50	0.08	0.50	0.75	3.00	3.50				
0.08	0.08	0.08	0.08	0.75	5.50				
0.08	0.08	0.08	1.00	7.50	2.50				
0.25	0.08	0.08	1.00	11.50	6.00				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

107 %

Left Bank: 57 ft Right Bank: 50 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **16.0**

Number of downed woody stems: 16

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **13.8**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
					24				
					8				
					9.5				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **2.0**

Left Side: 1 Right Side: 1

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **0.00**

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☑	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

1 Species in Group 1

1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

28.13 %

Left Side				Right Side			
10	30	35	0	30	10	50	60

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.09

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (<50% ground cover)	0.5	6	6
Impervious areas (parking lots, roofs, driveways, etc)	0	39	45
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	35	80
Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	20	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	48 %	0.47
V_{EMBED}	2.1	0.51
$V_{SUBSTRATE}$	0.63 in	0.31
V_{BERO}	107 %	0.50
V_{LWD}	16.0	1.00
V_{TDBH}	13.8	1.00
V_{SNAG}	2.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	28.1 %	0.34
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.09	0.09

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 7
Sampling Date: 3/13/19

Project Site | Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Shrub/Herb Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.50
Biogeochemical Cycling	0.41
Habitat	0.52

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	2.57	0.66
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	2.00	1.00
V_{BERO}	Total percent of eroded stream channel bank.	82.00	0.63
V_{LWD}	Number of down woody stems per 100 feet of stream.	17.00	1.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	88.00	1.00
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	29.38	0.36
V_{HERB}	Average percent cover of herbaceous vegetation.	66.88	0.89
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.17	0.18

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60603°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.94803°
Location:	STR 7	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Shrub/Herb Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used, <20%

List the percent cover measurements at each point below:

10	30	0	0	40	5	10	5	0	0

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.6

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	4	4	1	4	2				
3	4	3	3	2	3				
3	4	3	1	5	1				
3	4	1	1	2	1				
2	4	3	1	1	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

2.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.00	4.75	5.75	0.08	0.75	2.50				
2.00	3.25	1.50	1.00	2.00	0.75				
3.25	2.00	4.75	0.08	0.75	1.25				
4.50	2.50	2.50	0.08	2.00	3.50				
3.00	3.00	6.00	0.08	0.75	1.25				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

82 %

Left Bank: 57 ft Right Bank: 25 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **17.0**

Number of downed woody stems: 17

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **Not Used**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **0.0**

Left Side: 0 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **88.0**

Left Side: 54 Right Side: 34

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **0.00**

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☑	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

1 Species in Group 1

1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

29.38 %

Left Side				Right Side			
60	20	10	90	5	15	0	35

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

67 %

Left Side				Right Side			
90	100	80	90	30	70	50	25

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.17

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (<50% ground cover)	0.5	23	23
Impervious areas (parking lots, roofs, driveways, etc)	0	25	48
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	28	76
Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	24	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	Not Used, <20%	Not Used
V_{EMBED}	2.6	0.66
$V_{SUBSTRATE}$	2.00 in	1.00
V_{BERO}	82 %	0.63
V_{LWD}	17.0	1.00
V_{TDBH}	Not Used	Not Used
V_{SNAG}	0.0	0.10
V_{SSD}	88.0	1.00
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	29.4 %	0.36
V_{HERB}	67 %	0.89
V_{WLUSE}	0.17	0.18

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 8
Sampling Date: 3/13/19

Project Site | Before Project

Subclass for this SAR:
Intermittent Stream

Uppermost stratum present at this SAR:
Shrub/Herb Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.53
Biogeochemical Cycling	0.42
Habitat	0.57

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	2.91	0.79
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	3.25	1.00
V_{BERO}	Total percent of eroded stream channel bank.	0.00	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	16.00	1.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	100.00	1.00
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	34.38	0.42
V_{HERB}	Average percent cover of herbaceous vegetation.	40.00	0.53
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.16	0.17

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60628°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.94703°
Location:	STR 8	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Intermittent Stream

Top Strata: Shrub/Herb Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used, <20%

List the percent cover measurements at each point below:

30	10	50	0	0	5	10	10	10	10

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.9

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	5	5	3	1	4	3			
3	5	5	2	5	1	2			
4	2	2	3	2	1	1			
4	5	3	4	1	1	1			
3	5	3	3	5	1	1			

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

3.25 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.25	5.50	6.00	6.00	2.75	0.08	3.25			
3.50	2.00	2.00	2.00	2.50	4.00	6.50			
3.50	3.00	3.50	3.50	2.25	5.25	0.08			
3.75	3.75	3.75	3.75	2.50	0.08	0.08			
3.25	2.75	2.75	3.50	4.25	3.25	0.08			

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

0 %

Left Bank: 0 ft Right Bank: 0 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated.

Number of downed woody stems: 16

16.0

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

Not Used

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated.

Left Side: 0 Right Side: 0

0.0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated.

Left Side: 61 Right Side: 39

100.0

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.

0.00

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☑	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☐	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

0 Species in Group 1

1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

34.38 %

Left Side				Right Side			
0	40	85	20	90	10	30	0

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

40 %

Left Side				Right Side			
30	70	60	60	20	30	40	10

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.16

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (<50% ground cover)	0.5	20	20
Impervious areas (parking lots, roofs, driveways, etc)	0	22	42
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	35	77
Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	23	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	Not Used, <20%	Not Used
V_{EMBED}	2.9	0.79
$V_{SUBSTRATE}$	3.25 in	1.00
V_{BERO}	0 %	1.00
V_{LWD}	16.0	1.00
V_{TDBH}	Not Used	Not Used
V_{SNAG}	0.0	0.10
V_{SSD}	100.0	1.00
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	34.4 %	0.42
V_{HERB}	40 %	0.53
V_{WLUSE}	0.16	0.17

Notes:

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FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 9
Sampling Date: 3/13/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.54
Biogeochemical Cycling	0.74
Habitat	0.72

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	71.00	0.77
V_{EMBED}	Average embeddedness of channel.	3.87	1.00
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	2.63	1.00
V_{BERO}	Total percent of eroded stream channel bank.	139.00	0.33
V_{LWD}	Number of down woody stems per 100 feet of stream.	18.00	1.00
V_{TDBH}	Average dbh of trees.	6.81	0.64
V_{SNAG}	Number of snags per 100 feet of stream.	1.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	28.75	0.35
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.40	0.42

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60511°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.94454°
Location:	STR 9	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

71.0 %

List the percent cover measurements at each point below:

0	100	100	90	70	90	100	60	100	0

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

3.9

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

5	3	3	4	4	4				
5	5	3	5	3	4				
5	4	4	5	2	4				
4	4	5	4	3	4				
3	2	3	4	5	3				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

2.63 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

2.75	3.50	2.75	4.25	2.50	4.50				
2.00	1.50	5.25	2.00	1.50	2.25				
2.25	2.50	1.25	2.25	1.50	5.00				
0.75	2.50	4.00	2.75	3.00	5.75				
4.50	3.75	5.25	2.00	3.00	1.25				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

139 %

Left Bank: 61 ft Right Bank: 78 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5	V_{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. Number of downed woody stems: 18	18.0
6	V_{TDBH}	Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.	6.8
7	V_{SNAG}	Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. Left Side: 1 Right Side:	1.0
8	V_{SSD}	Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. Left Side: Right Side:	Not Used
9	V_{SRICH}	Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.	0.00

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
9	5.5	7			8.5				
6	4.5				7				
5.5	6								
5	5								
6	10								
4.5	9								
5.5	7.5								
8	10.5								
4.5	8.5								

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☑	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☑	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☐	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						
1	Species in Group 1			1	Species in Group 2		

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

28.75 %

Left Side				Right Side			
50	20	40	40	10	30	20	20

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.40

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (<50% ground cover)	0.5	70	70
Impervious areas (parking lots, roofs, driveways, etc)	0	4	74
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	4	78
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	22	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	71 %	0.77
V_{EMBED}	3.9	1.00
$V_{SUBSTRATE}$	2.63 in	1.00
V_{BERO}	139 %	0.33
V_{LWD}	18.0	1.00
V_{TDBH}	6.8	0.64
V_{SNAG}	1.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	28.8 %	0.35
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.4	0.42

Notes:

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 10 (DS Point)
Sampling Date: 10/8/19

Project Site | Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.60
Biogeochemical Cycling	0.67
Habitat	0.64

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	42.50	0.40
V_{EMBED}	Average embeddedness of channel.	3.80	1.00
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	4.25	1.00
V_{BERO}	Total percent of eroded stream channel bank.	25.00	0.94
V_{LWD}	Number of down woody stems per 100 feet of stream.	10.00	1.00
V_{TDBH}	Average dbh of trees.	6.81	0.64
V_{SNAG}	Number of snags per 100 feet of stream.	1.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	1.00	0.48
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	34.38	0.42
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.21	0.22

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.61167°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.93481°
Location:	STR 10 (DS Point)	Sampling Date:	10/8/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

42.5 %

List the percent cover measurements at each point below:

10	10	15	20	30	40	60	70	90	80

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

3.8

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

5	4	5	3	3	4	5	3	5	4
5	4	5	3	4	5	3	3	5	4
2	4	4	3	3	3	3	3	3	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

4.25 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

5.00	4.00	7.00	13.00	2.00	2.00	1.00	7.00	8.00	3.00
4.00	2.50	3.50	8.00	12.00	2.50	2.00	3.00	8.50	4.50
7.50	8.00	8.00	3.00	3.00	4.50	2.50	3.50	6.00	6.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

25 %

Left Bank: 20 ft Right Bank: 5 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **10.0**

Number of downed woody stems: 10

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **6.8**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
11	4	10	4	7	4	5			
8	13	7	6	4					
5	4	12	5						

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **1.0**

Left Side: 1 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **Not Used**

Left Side: 0 Right Side: 0

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **1.00**

Group 1 = 1.0				Group 2 (-1.0)			
☑	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☐	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

1 Species in Group 1

0 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

34.38 %

Left Side				Right Side			
50	60	40	70	10	15	20	10

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

Not Used

Left Side				Right Side			
10	10	20	20	15	25	25	15

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.21

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	24	24
Impervious areas (parking lots, roofs, driveways, etc)	0	15	39
Urban districts, Commercial and business (>70% cover)	0	20	59
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	21	80
Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	20	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	43 %	0.40
V_{EMBED}	3.8	1.00
$V_{SUBSTRATE}$	4.25 in	1.00
V_{BERO}	25 %	0.94
V_{LWD}	10.0	1.00
V_{TDBH}	6.8	0.64
V_{SNAG}	1.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	1.00	0.48
$V_{DETRITUS}$	34.4 %	0.42
V_{HERB}	Not Used	Not Used
V_{WLUSE}	0.21	0.22

Notes:

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 10 (US Point)
Sampling Date: 3/13/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Shrub/Herb Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.33
Biogeochemical Cycling	0.34
Habitat	0.36

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	2.97	0.81
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	3.00	1.00
V_{BERO}	Total percent of eroded stream channel bank.	0.00	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	0.00	0.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	37.00	0.57
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	35.00	0.43
V_{HERB}	Average percent cover of herbaceous vegetation.	17.50	0.23
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.24	0.25

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.61025°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.93978°
Location:	STR 10 (US Point)	Sampling Date:	3/13/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Shrub/Herb Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used, <20%

List the percent cover measurements at each point below:

5	15	0	10	10	20	10	10	15	5

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

3.0

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

2	4	5	5	3	1				
4	1	3	3	2	2				
2	4	4	1	2	2				
3	5	5	3	1	5				
3	4	4	1	4	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

3.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

5.50	3.50	3.00	2.50	4.50	0.08				
2.25	2.25	3.50	4.00	5.00	2.00				
7.50	0.75	4.00	0.08	1.50	1.25				
4.75	5.50	6.25	3.50	0.08	2.00				
3.50	3.00	2.50	0.08	8.50	0.08				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

0 %

Left Bank: 0 ft Right Bank: 0 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **0.0**

Number of downed woody stems: 0

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **Not Used**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **0.0**

Left Side: 0 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **37.0**

Left Side: 2 Right Side: 35

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **0.00**

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

0 Species in Group 1 | 1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

35.00 %

Left Side				Right Side			
10	30	10	30	45	55	50	50

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

18 %

Left Side				Right Side			
10	10	20	20	15	25	25	15

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.24

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	23	23
Impervious areas (parking lots, roofs, driveways, etc)	0	25	48
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	25	73
Residential districts, 1/4 - 1/3 ac (38% to 30% cover)	0.1	27	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	Not Used, <20%	Not Used
V_{EMBED}	3.0	0.81
$V_{SUBSTRATE}$	3.00 in	1.00
V_{BERO}	0 %	1.00
V_{LWD}	0.0	0.00
V_{TDBH}	Not Used	Not Used
V_{SNAG}	0.0	0.10
V_{SSD}	37.0	0.57
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	35.0 %	0.43
V_{HERB}	18 %	0.23
V_{WLUSE}	0.24	0.25

Notes:

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 11
Sampling Date: 10/8/19

Project Site Before Project

Subclass for this SAR:
Perennial Stream

Uppermost stratum present at this SAR:
Shrub/Herb Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.25
Biogeochemical Cycling	0.25
Habitat	0.19

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	2.40	0.60
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	4.50	1.00
V_{BERO}	Total percent of eroded stream channel bank.	15.00	0.99
V_{LWD}	Number of down woody stems per 100 feet of stream.	0.00	0.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	0.00	0.00
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	5.63	0.07
V_{HERB}	Average percent cover of herbaceous vegetation.	61.88	0.82
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.18	0.19

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.61123°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.93582°
Location:	STR 11	Sampling Date:	10/8/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Perennial Stream

Top Strata: Shrub/Herb Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used, <20%

List the percent cover measurements at each point below:

0									

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

2.4

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

3	2	4	3	4	2	1	1	1	4
3	2	4	1	1	3	2	4	2	3
2	3	3	4	1	1	2	2	2	2

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

4.50 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

12.00	8.00	5.00	13.00	1.50	5.00	4.00	7.00	0.50	5.00
11.00	9.00	7.50	8.50	2.00	2.00	3.50	6.50	9.00	8.50
11.00	3.00	2.00	2.00	4.00	1.50	1.50	1.00	2.00	1.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

15 %

Left Bank: 5 ft Right Bank: 10 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **0.0**

Number of downed woody stems: 0

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **Not Used**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				
0					0				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **0.0**

Left Side: 0 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **0.0**

Left Side: 0 Right Side: 0

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **0.00**

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☐	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

0 Species in Group 1

0 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

5.63 %

Left Side				Right Side			
5	5	5	5	5	10	5	5

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

62 %

Left Side				Right Side			
95	95	95	95	95	10	5	5

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed:

0.18

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	24	24
Impervious areas (parking lots, roofs, driveways, etc)	0	43	67
Urban districts, Commercial and business (>70% cover)	0	23	90
Open space (pasture, lawns, parks, etc.), grass cover <50%	0.1	10	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	Not Used, <20%	Not Used
V_{EMBED}	2.4	0.60
$V_{SUBSTRATE}$	4.50 in	1.00
V_{BERO}	15 %	0.99
V_{LWD}	0.0	0.00
V_{TDBH}	Not Used	Not Used
V_{SNAG}	0.0	0.10
V_{SSD}	0.0	0.00
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	5.6 %	0.07
V_{HERB}	62 %	0.82
V_{WLUSE}	0.18	0.19

Notes:

Ver. 9-21-17

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2015).

Project Name: Greenbag Road Improvement Project
Location: STR 12 - Aaron Creek
Sampling Date: 3/13/19

Project Site: Before Project

SAR number: 1

Enter Results in Section A of the Mitigation Sufficiency Calculator

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.74
Biogeochemical Cycling	0.54
Habitat	0.61

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canopy over channel.	34.50	0.21
V_{EMBED}	Average embeddedness of channel.	3.40	0.86
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	6.00	1.00
$V_{BANKSTAB}$	Weighted lengths of erosion by class	45.00	0.62
V_{LWD}	Number of down woody stems per 100 feet of stream.	6.67	0.48
V_{TDBH}	Average dbh of trees.	7.67	0.82
V_{TDEN}	Average Density of Trees	195.31	1.00
V_{CVALUE}	Average Coefficient of Conservatism of riparian species.	2.50	0.57
V_{FOREST}	Percent forest cover for Catchment.	83.00	0.94

Version 9-21-17

Low-Gradient Perennial Streams in Appalachia
Field Data Sheet and Calculator

Assessment Team: Markosky
Project Name: Greenbag Road Improvement Project
Location: STR 12 - Aaron Creek
SAR Number: 1
Thalweg Length (ft): 300 (300 ft suggested minimum)

Latitude/UTM Northing: 39.61212°
Longitude/UTM Easting: -79.93338°
Sampling Date: 3/13/19

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure for all streams, even if cover is less than 20%.

34.5 %

List the percent cover measurements at each point below (between 0 and 100):

0	10	20	15	40	30	60	65	70	35

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 60 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

3.40

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment **(or bedrock)**
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment **(or artificial surface)**

List the ratings at each point below:

4	4	3	3	4	3	2	4	4	4
3	3	3	3	4	4	4	4	2	4
3	4	3	3	4	4	2	3	4	4
3	4	3	2	4	3	4	2	4	4
2	3	4	4	3	2	2	2	4	4
5	4	4	4	3	4	2	4	4	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 60 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

6.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

3.00	4.00	7.00	10.00	7.00	4.00	2.00	3.00	3.00	1.00
10.00	8.00	7.00	4.00	2.00	6.00	9.00	2.00	6.00	5.00
13.00	8.00	10.00	3.00	5.00	3.00	4.00	4.00	2.00	5.00
10.00	4.00	2.00	11.00	40.00	9.50	4.00	2.00	2.50	6.00
9.50	6.50	8.00	11.00	5.50	8.00	9.00	1.50	4.00	8.00
8.00	7.00	10.50	10.00	6.00	6.00	8.50	3.00	4.00	10.00

4 $V_{BANKSTAB}$ This variable is an index incorporating three elements of bank stability: 1) bank erosion length, 2) height category of eroded bank (0.1–2 ft, 2.1–4 ft, >4 ft, or artificial stabilization), and 3) length of artificial stream bank stabilization. Measure the length of the SAR along the thalweg, and enter at the top of the page. Record the length of each eroded area, using the drop down menus to select erosion class. Measure erosion on both sides of the stream. Index ranges from 0 to 200. **45.0**

☐ Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft): 300

Total Weighted Erosion length (ft): 135

Left Stream Bank				**Right Stream Bank**			
Height of Erosion Category	Height Index	Length	Contri-bution	Height of Erosion Category	Height Index	Length	Contri-bution
1) 0.1 - 2 ft.	0.5	30 ft	15.0 ft	4) Artificial Bank	0.5	200 ft	100.0 ft
3) >4 ft.	1.0	20 ft	20.0 ft				
Left Bank Erosion length:		50 ft		Right Bank Erosion length:		200 ft	

Sample Variable 5 within the entire riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page. **6.7**

Number of downed woody stems: 20

Sample Variable 6-8 within at least four 0.032-acre (21' radius) plots within the riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

6 V_{TDBH} Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **7.67 in**

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		**Plot 2**		**Plot 3**		**Plot 4**		**Plot 5**		**Plot 6**	
☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☑ Plot Used ☐ No Trees		☐ Plot Used ☐ No Trees		☐ Plot Used ☐ No Trees	
7		7		4		4					
5		14		4		9					
5		22		4		6					
4				7		4					
6						4					
5						7					
9						8					
						8					
						4					
						4					
						5					
Plot Average		Plot Average		Plot Average		Plot Average		Plot Average		Plot Average	
5.86 in.		14.33 in.		4.75 in.		5.73 in.					

7	V_{TDEN}	Tree density, based on trees recorded for V_{TDBH} in four to six 0.032-acre plots. At least four plots must be used.	195.3
8	V_{CVALUE}	Coefficient of conservatism. The average published Coefficients of Conservatism for all native trees and all non-natives in any strata. Coefficients of Conservatism range from 0 (non-natives) to 10 (natives with high fidelity to a specific habitat). Use Drop down menus to select species, once per species. Non-natives are recorded if they occur anywhere in the riparian/buffer zone	2.50

Native Trees				**Non-Natives in Any Strata**			
Species	C-Value	Species	C-Value	Species	C-Value	Species	C-Value
Platanus occidentalis	5			*Rosa multiflora*	0		
Juglans nigra	5			*Berberis thunbergii*	0		

Sample Variable 9 within the entire catchment of the SAR.

9	V_{FOREST}	Percent cover of forested area within the entire watershed that provides water to the perennial stream. Using GIS or aerial photos, enter the estimated percent cover of forest directly, or the acreage of the entire watershed and then the acreage of forested area, below (direct measure will take precedence if both are entered) .	83.0 %

Estimated percent cover of forest in the catchment of the SAR: 83.0 %

OR

Estimated acreage for the catchment of the SAR:

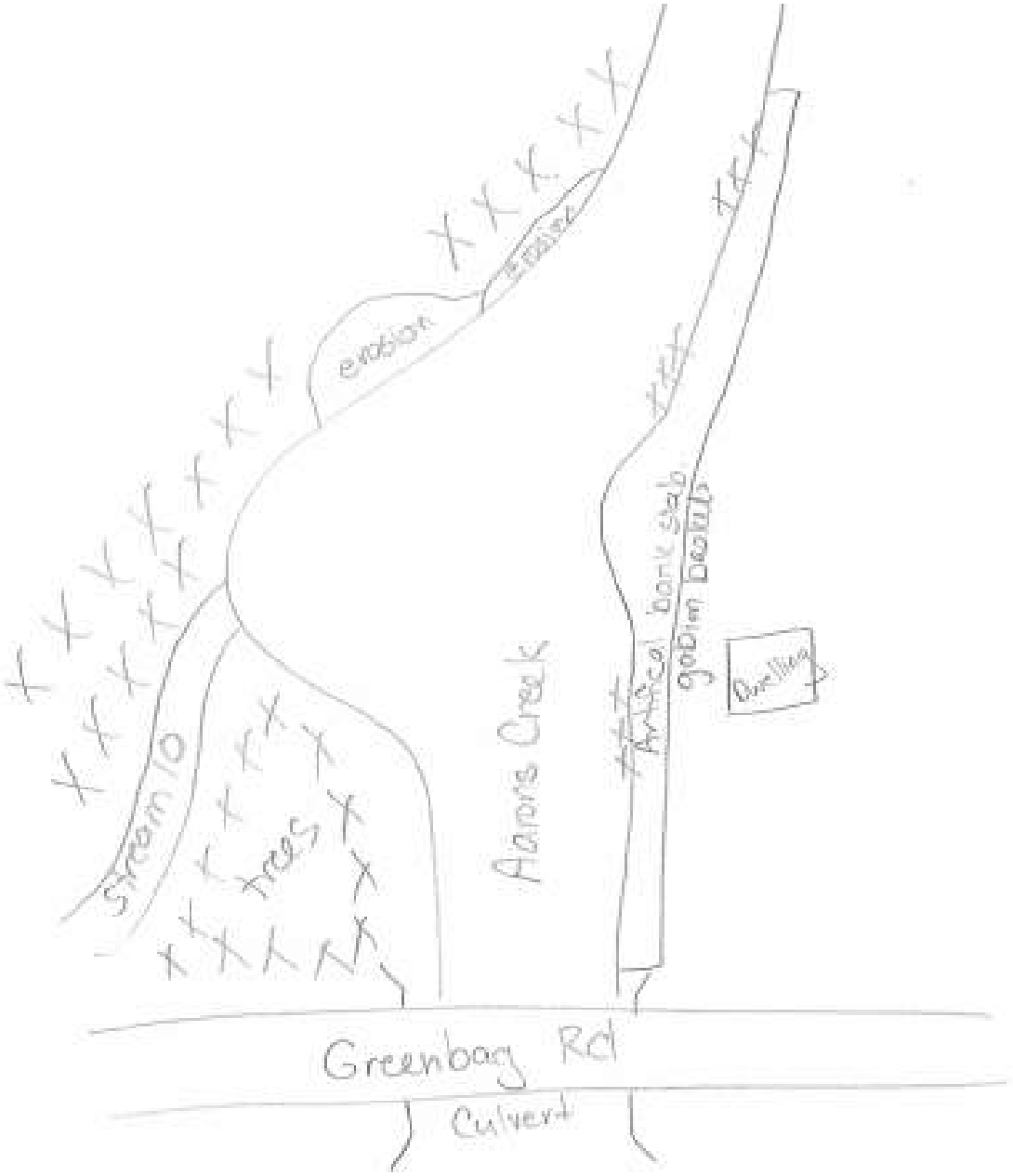
Estimated acreage of forest in the catchment of the SAR:

Summary: SAR Number 1

Variable	Value	VSI
$V_{CCANOPY}$	35 %	0.21
V_{EMBED}	3.4	0.86
$V_{SUBSTRATE}$	6.00 in	1.00
$V_{BANKSTAB}$	45 %	0.62
V_{LWD}	6.7	0.48
V_{TDBH}	7.7 in	0.82
V_{TDEN}	195.3 /ac	1.00
V_{CVALUE}	2.50	0.57
V_{FOREST}	83.0 %	0.94

Notes:

Add Notes and a Site Sketch in this space:



Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the UPPERMOST STRATUM of the plant community is determined based on the calculated value for $V_{CCANOPY}$ (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Greenbag Road Improvement Project
Location: STR 13
Sampling Date: 10/8/19

Project Site | Before Project

Subclass for this SAR:
Intermittent Stream

Uppermost stratum present at this SAR:
Shrub/Herb Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.64
Biogeochemical Cycling	0.48
Habitat	0.69

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	4.30	0.85
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	1.75	0.88
V_{BERO}	Total percent of eroded stream channel bank.	2.00	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	20.00	1.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V_{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	55.00	0.85
V_{SRICH}	Riparian vegetation species richness.	0.00	0.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	80.00	0.98
V_{HERB}	Average percent cover of herbaceous vegetation.	13.75	0.18
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.33	0.35

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team:	Markosky	Latitude/UTM Northing:	39.60831°
Project Name:	Greenbag Road Improvement Project	Longitude/UTM Easting:	-79.95486°
Location:	STR 13	Sampling Date:	10/8/19

SAR Number: 1 Reach Length (ft): 100 Stream Type: Intermittent Stream

Top Strata: Shrub/Herb Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Project Site | Before Project

Sample Variables 1-4 in stream channel

1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

Not Used, <20%

List the percent cover measurements at each point below:

5									

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.

4.3

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

5	5	5	4	5	4	5	5	4	4
4	4	4	3	5	5	4	4	5	4
3	4	4	5	5	3	5	4	4	4

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

1.75 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

3.00	3.50	1.50	1.50	1.50	0.50	2.00	1.00	0.50	0.50
2.00	2.50	3.00	1.50	2.00	2.00	2.00	1.00	4.00	2.50
1.50	1.50	2.00	1.50	0.50	1.00	3.00	2.50	1.50	3.00

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

2 %

Left Bank: 2 ft Right Bank: 0 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 feet from each bank).

5 V_{LWD} Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated. **20.0**

Number of downed woody stems: 20

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches. **Not Used**

List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below:

Left Side					Right Side				

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated. **0.0**

Left Side: 0 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated. **55.0**

Left Side: 20 Right Side: 35

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **0.00**

Group 1 = 1.0				Group 2 (-1.0)			
☐	*Acer rubrum*	☐	*Magnolia tripetala*	☐	*Ailanthus altissima*	☐	*Lonicera japonica*
☐	*Acer saccharum*	☐	*Nyssa sylvatica*	☐	*Albizia julibrissin*	☐	*Lonicera tatarica*
☐	*Aesculus flava*	☐	*Oxydendrum arboreum*	☐	*Alliaria petiolata*	☐	*Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐	*Alternanthera philoxeroides*	☐	*Lythrum salicaria*
☐	*Betula alleghaniensis*	☐	*Quercus alba*			☐	*Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐	*Aster tataricus*	☐	*Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐	*Cerastium fontanum*	☐	*Polygonum cuspidatum*
☐	*Carya glabra*	☐	*Quercus prinus*	☐	*Coronilla varia*	☐	*Pueraria montana*
☐	*Carya ovalis*	☐	*Quercus rubra*	☐	*Elaeagnus umbellata*	☑	*Rosa multiflora*
☐	*Carya ovata*	☐	*Quercus velutina*	☐	*Lespedeza bicolor*	☐	*Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐	*Lespedeza cuneata*	☐	*Verbena brasiliensis*
☐	*Fagus grandifolia*	☐	*Tilia americana*	☐	*Ligustrum obtusifolium*		
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐	*Ligustrum sinense*		
☐	*Liriodendron tulipifera*	☐	*Ulmus americana*				
☐	*Magnolia acuminata*						

0 Species in Group 1 | 1 Species in Group 2

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot.

80.00 %

Left Side				Right Side			
70	90	100	75	70	75	90	70

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot.

14 %

Left Side				Right Side			
5	10	15	20	15	20	10	15

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: **0.33**

Land Use (Choose From Drop List)	Runoff Score	% in Catch-ment	Running Percent (not >100)
Forest and native range (50% to 75% ground cover)	0.7	44	44
Impervious areas (parking lots, roofs, driveways, etc)	0	31	75
Open space (pasture, lawns, parks, etc.), grass cover 50% - 75%	0.2	10	85
Residential districts, 1/8 ac or less (apartments, etc.) (65% cover)	0	15	100

Summary: SAA Number 1

Variable	Value	VSI
$V_{CCANOPY}$	Not Used, <20%	Not Used
V_{EMBED}	4.3	0.85
$V_{SUBSTRATE}$	1.75 in	0.88
V_{BERO}	2 %	1.00
V_{LWD}	20.0	1.00
V_{TDBH}	Not Used	Not Used
V_{SNAG}	0.0	0.10
V_{SSD}	55.0	0.85
V_{SRICH}	0.00	0.00
$V_{DETRITUS}$	80.0 %	0.98
V_{HERB}	14 %	0.18
V_{WLUSE}	0.33	0.35

Notes:

APPENDIX D
Resource Photographs



Photo 1: Wetland WL1 – Facing East (2.4.19)



Photo 2: Wetland WL1 – Facing North (2.4.19)



Photo 3: Wetland WL2 - Facing Southwest (2.4.19)



Photo 4: Wetland WL2- Facing Northeast (2.4.19)



Photo 5: Wetland WL3 - Facing Southwest (2.4.19)



Photo 6: Wetland WL3 - Facing South (2.4.19)



Photo 7: Wetland WL4 – Facing Northeast (2.4.19)



Photo 8: Wetland WL4 - Facing North (2.4.19)



Photo 9: Wetland WL5 – Facing South (2.4.19)



Photo 10: Wetland WL5 - Facing West (2.4.19)



Photo 11: Wetland WL6 – Facing East (2.4.19)



Photo 12: Wetland WL6 - Facing West (2.4.19)



Photo 13: Wetland WL7 – Facing North (2.4.19)



Photo 14: Wetland WL7 - Facing South (2.4.19)



Photo 15: STR 1 (Cobun Creek) – Facing Upstream (3.13.19)



Photo 16: STR 1 (Cobun Creek) - Facing Downstream (3.13.19)



Photo 17: STR 2 – Facing Upstream (3.13.19)



Photo 18: STR 2 - Facing Downstream (3.13.19)



Photo 19: STR 3 – Facing Upstream (3.13.19)



Photo 20: STR 3 - Facing Downstream (3.13.19)



Photo 21: STR 4 – Facing Upstream (3.13.19)



Photo 22: STR 4 - Facing Downstream (3.13.19)



Photo 23: STR 5 – Facing Upstream (3.13.19)



Photo 24: STR 5 - Facing Downstream (3.13.19)



Photo 25: STR 6 – Facing Upstream (3.13.19)



Photo 26: STR 6 - Facing Downstream (3.13.19)



Photo 27: STR 7 – Facing Upstream (3.13.19)



Photo 28: STR 7 - Facing Downstream (3.13.19)



Photo 29: STR 8 – Facing Upstream (3.13.19)



Photo 30: STR 8 - Facing Downstream (3.13.19)



Photo 31: STR 9 – Facing Upstream (2.4.19)



Photo 32: STR 9 - Facing Downstream (2.4.19)



Photo 33: STR 10(US Point) – Facing Upstream (2.4.19)



Photo 34: STR 10(US Point) - Facing Downstream (2.4.19)



Photo 35: STR 11 – Facing Upstream (2.4.19)



Photo 36: STR 11- Facing Downstream (2.4.19)



Photo 37: STR 10 (DS Point) – Facing Upstream (10.8.19)



Photo 38: STR 10 (DS Point) - Facing Downstream (10.8.19)



Photo 39: STR 12 (Aaron Creek) – Facing Upstream (10.8.19)



Photo 40: STR 12 (Aaron Creek) - Facing Downstream (10.8.19)



Photo 41: STR 13 – Facing Upstream (10.8.19)



Photo 42: STR 13- Facing Downstream (10.8.19)



Photo 43: Wetland WL8 – Facing East (10.8.19)



Photo 44: Wetland WL8 - Facing West (10.8.19)

Greenbag Road Improvement Project

Appendix C

Noise Report

Highway Traffic Noise Analysis Review

Prepared for the:

Greenbag Road Improvement Project

City of Morgantown
Monongalia County, West Virginia

Prepared for:

The West Virginia Department of Transportation
Division of Highways
1334 Smith Street
Charleston, WV 25305-0430

Prepared by:

3689 Route 711
Ligonier, PA 15658

November 2019

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Narrative Analysis Conclusion ..... pg. 7

Project Location Map ..... Appendix A

Noise Impact Study Map ..... Appendix B

Introduction

The project area involves the Greenbag Road (CR 857) corridor in a suburban and semi-commercially developed portion of the City of Morgantown, Monongalia County (Appendix A). The current project extends approximately 1.65 miles along Greenbag Road from 0.25 mile west of the Mississippi Street (CR 857/1) intersection to the crossing of Aaron Creek, approximately 0.10 mile west of Lower Aarons Creek Road and includes improvements at the Greenbag Road intersections at Mississippi Street and Dorsey Avenue/Kingwood Pike (CR 81).

The overall roadway improvements along Greenbag Road include wider lanes and shoulders along with a dedicated center turn lane west of the Mississippi Street intersection. A curb and gutter will be installed along the north side of Greenbag Road to help address drainage issues and to provide a sidewalk along the entire route to the Dorsey Avenue/Kingwood Pike (CR 81) intersection. In addition, the north side shoulder will be utilized as a bike lane for the corridor between the commercial district and the residential areas.

The roadway will be improved to incorporate two 11-foot travel lanes, a 12-foot center turn lane, and curb and gutter on each side up to Mississippi Street. Between Mississippi Street and Dorsey Avenue/Kingwood Pike, the roadway will be improved to two 12-foot travel lanes with a 4-foot paved shoulder on the south side. A 3-foot paved shoulder with a 2-foot curb and gutter will be on the north side. A 5-foot concrete sidewalk will be located on the north side of Greenbag Road and connect with the sidewalk at Mountainview Elementary School.

Both the Mississippi Street and Dorsey Ave/Kingwood Pike intersections with Greenbag Road are proposed to be reconstructed as single-lane roundabouts to provide for continuous traffic flow along the route and to increase the safety of the traveling public as they enter each intersection. The roundabouts will also be developed to allow the safe movement of pedestrians along the sidewalk on the north side of Greenbag Road and will include lighting on each approach to the roundabout.

Additional work on Luckey Lane will improve the width of the travel lanes within the existing right-of-way and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. From the intersection of Greenbag Road and Jonathan Lane to the crossing of Aaron Creek the project will include roadside drainage improvements as needed to address stormwater run-off.

Existing land use in the vicinity of the Greenbag Road project is a mixture of residential, commercial, transportation, deciduous forests, active agricultural fields, and scrub/shrub rangeland.

This report identifies the potential noise receptor locations in the vicinity of the Greenbag Road project corridor, the project work to be performed adjacent to these receptors, and justifies a Type 3 Project determination which does not require a detailed noise analysis.

Project Type Determination Methodology

The project type determination was conducted in accordance with the methodology described in the *West Virginia Department of Transportation, Division of Highways, Noise Analysis and Abatement Guidelines (DD-253)*. The criteria for defining the specific project types as presented in *DD-253* is as follows:

Type 1 Project

A Type I Project is any project that meets one of the following criteria.

1. The construction of a highway on a new location
2. The physical alteration of an existing highway where there is either:
   i. Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition and the future build condition
   ii. Substantial Vertical Alteration. A project that removes shielding therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor
3. The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane.
4. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane.
5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange.
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane.
7. The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.
8. If a project is determined to be a Type 1 project, then the entire project area as defined in the environmental document is a Type 1 project.

A Type 1 project requires a detailed noise analysis.

Type 2 Project

A Type 2 Project is a Federal or Federal-aid highway project for noise abatement on an existing highway. For a Type 2 project to be eligible for Federal-aid funding, the highway agency must develop and implement a Type 2 program in accordance with section 772.7€. The WVDOT does not develop or implement Type 2 projects.

Type 3 Project

A Type 3 Project is a Federal or Federal-aid highway project that does not meet the classifications of a Type 1 or Type 2 project. Type 3 projects do not require a noise analysis.

Noise Receptor Analysis Findings

A total of twelve (12) noise study areas (NSA) were identified along the project corridor (Appendix B). Each NSA contains multiple sensitive receptors existing in a similar noise environment. Associated receptors for each NSA are as follows:

NSA 1 includes 3 retail businesses, a veterinary clinic and an animal boarding facility.
NSA 2 includes a vocational education facility and a sports facility.
NSA 3 includes a restaurant and an office building.
NSA 4 includes 110 single family homes, 2 apartment buildings, and a sports facility.
NSA 5 includes 2 single family homes.
NSA 6 includes 16 single family homes, 5 apartment buildings with lower level office space, and 3 office buildings.
NSA 7 includes 2 single family homes, an apartment building with lower level office space, an office building, a school, and a church.
NSA 8 includes 32 single family homes, an apartment building, 5 office buildings, and a school.
NSA 9 includes 9 single family homes, an apartment building with lower level office space, and 2 churches.
NSA 10 includes a church, 5 retail businesses, an office building, and a sports facility.
NSA 11 includes 4 single family homes, 12 town home buildings, a veterinary clinic, and an office building.
NSA 12 includes 3 single family homes.

The roadway improvements, including widening, intersection improvements, drainage improvements, and additional pedestrian facilities were reviewed for each NSA to determine if the project was either a Type 1 or a Type 3 project. If any noise receptor site meets the criteria for a Type 1 project, then noise analysis must be performed for the entire project.

This project is not a Federal or Federal-aid highway project for noise abatement on an existing highway. Therefore this project is not a Type 2 project.

Type 1 Project Analysis

The 12 NSAs were assessed based on the criteria outlined in the Type 1 project requirements. Assessments for each criterion are described as follows:

Criteria 1 – This project is not the construction of a highway on a new location. Therefore, the Greenbag Road project does not meet the requirements of criteria 1.

Criteria 2 – There are several horizontal and vertical adjustments required for this project. The 12 NSA locations were analyzed further to determine if any of the associated receptors meet the requirements of criteria 2. The analysis of these sites is as follows:

NSA 1 – The work at this location will involve the widening of Greenbag Road, installation of a center turn lane, installation of a sidewalk, and drainage improvements. The widening and turn lane installation on Greenbag Road will not halve the distance between the traffic noise source and any sensitive receptors. The excavation required to widen Greenbag Road, install the turn lane, and install the sidewalk/drainage improvements does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profile of Greenbag Road will not be altered at this location. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 2 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 2. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 3 – The work at this location will involve the widening of Greenbag Road, installation of a center turn lane, drainage improvements, and construction of a roundabout intersection just east of NSA 3. The widening and turn lane installation on Greenbag Road will not halve the distance between the traffic noise source and any sensitive receptors. The excavation required to widen Greenbag Road, install the turn lane and drainage improvements, and construct the roundabout to the east does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profile of Greenbag Road will not be altered at this location. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 4 – The work at this location will involve the widening of Greenbag Road, installation of a center turn lane, installation of a sidewalk, drainage

improvements, and construction of a roundabout intersection just west of NSA 4. The widening, turn lane installation, and roundabout construction on Greenbag Road will not halve the distance between the traffic noise source and any sensitive receptors. The excavation required to widen Greenbag Road, install the turn lane, sidewalk, and drainage improvements, and construct the roundabout does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profile of Greenbag Road will not be altered at this location. The roadway profile of Mississippi Street west of NSA 4 will be raised by roughly 2 feet. However, this small height adjustment will not expose the line of sight for any receptors to the traffic noise source. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 5 – The work at this location involves the realignment of Kingwood Pike to accommodate the proposed roundabout at its intersection with Greenbag Road. The proposed alignment will move the traffic noise source further away from the sensitive receptors. The excavation required to realign Kingwood Pike and construct the roundabout intersction does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profile of Greenbag Road will not be altered at this location. The roadway profile of Kingwood Pike will be raised by roughly 2 feet over existing ground. However, this small height adjustment will not alter exposure to the line of sight for any receptors to the traffic noise source. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 6 – The work at this location involves the repaving of Dorsey Avenue, installation of a 5-foot sidewalk, and the realignment of Dorsey Avenue to accommodate the proposed roundabout at its intersection with Greenbag Road. The realignment of Dorsey Avenue will not halve the distance between the traffic noise source and any sensitive receptors. The excavation required to realign Dorsey Avenue and install the 5-foot sidewalk does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profile of Greenbag Road will not be altered at this location. The roadway profile of Dorsey Avenue will be raised less than 1 foot over existing ground. However, this small height adjustment will not alter exposure to the line of sight for any receptors to the traffic noise source. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 7 – The work at this location involves the repaving of Dorsey Avenue, installation of a 5-foot sidewalk, and the widening of Luckey Lane. The widening of Luckey Lane will not halve the distance between the traffic noise source and any sensitive receptors. The excavation required to widen Luckey Lane and install the 5-foot sidewalk does not remove shielding that exposes the line of sight between the traffic noise source and any sensitive receptors. The roadway profiles of Dorsey Avenue and Luckey Lane will not be altered at this location. The

Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 8 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 8. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 9 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 9. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 10 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 10. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 11 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 11. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

NSA 12 – The work at this location will involve re-paving and drainage improvements only. No horizontal or vertical alteration of the traffic noise source will occur in the vicinity of NSA 12. The Greenbag Road project does not meet the requirements for criteria 2 at this location.

The project work does not substantially alter the horizontal or vertical alignment of the roadway corridor at any noise receptors distributed across the 12 NSAs. Therefore, the Greenbag Road project does not meet the requirements of criteria 2.

Criteria 3 – This project does not include the addition of any through-traffic lanes that function as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane. Therefore, the Greenbag Road project does not meet the requirements of criteria 3.

Criteria 4 – There will be the addition of auxiliary lanes at the Bluegrass Village driveway intersection (NSA 4) and west of Mississippi Street (NSA 1, 2, 3) for this project. Both auxiliary lanes will function as turn lanes. Therefore, the Greenbag Road project does not meet the requirements of criteria 4.

Criteria 5 – There are no interchange lanes or ramps being added or relocated to complete an existing partial interchange. Therefore, the Greenbag Road project does not meet the requirements of criteria 5.

Criteria 6 – No restriping of existing pavement to add a through-traffic lane or an auxiliary lane will occur as a part of this project. Therefore, the Greenbag Road project does not meet the requirements of criteria 6.

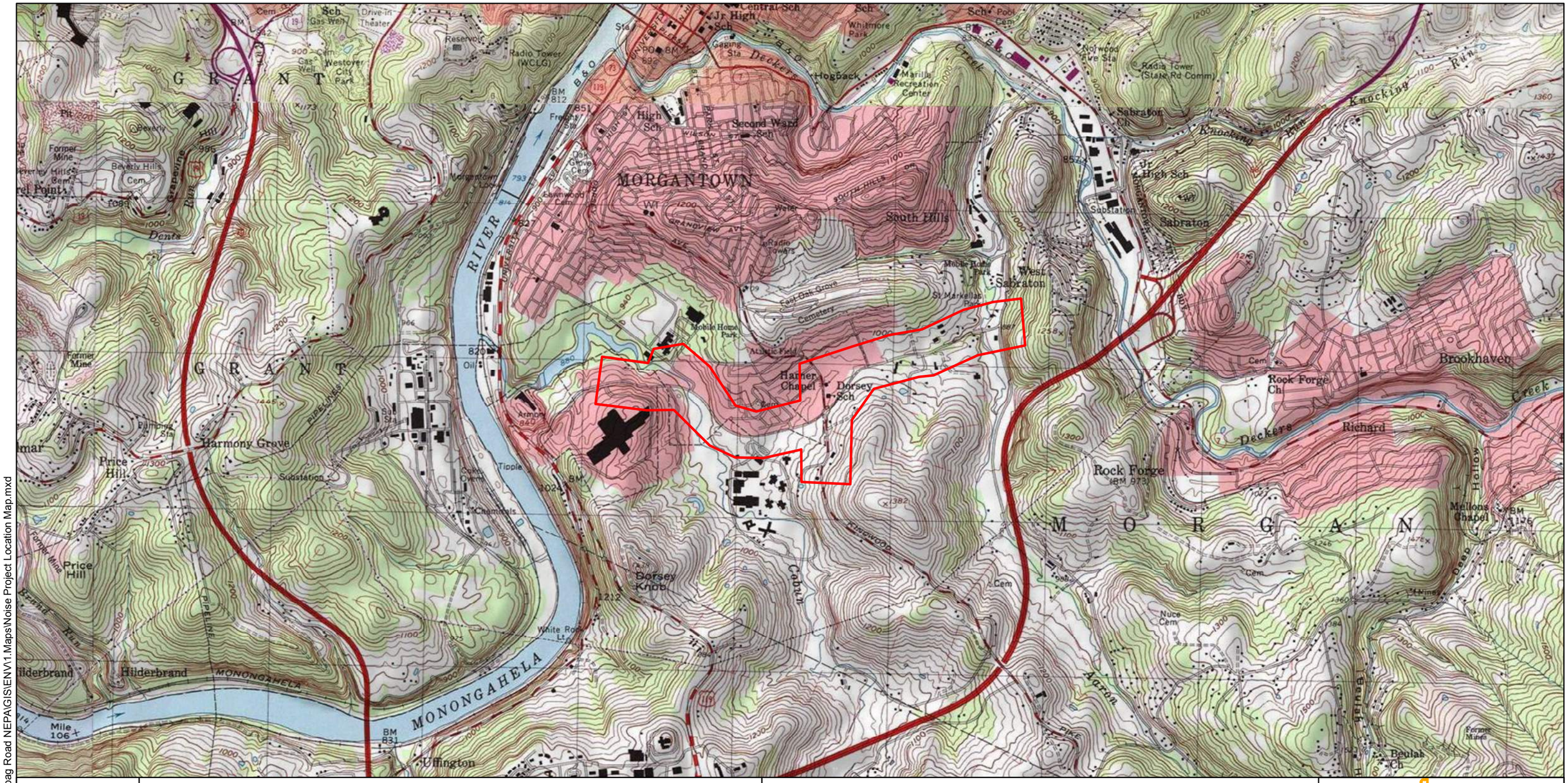
Criteria 7 – There are no existing weigh stations, rest stops, ride-share lots, or toll plazas to be modified and none are proposedas a part of this project. Therefore, the Greenbag Road project does not meet the requirements of criteria 7.

Criteria 8 – No receptors are affected by any of the previously mentioned criteria. Therefore, the Greenbag Road project does not meet the requirements of criteria 8.

Narrative Analysis Conclusion

All potential noise receptor sites within the project study corridor have been assessed according to the methodology described above. Based on this assessment, it has been determined the Greenbag Road project is a Type 3 Project and no further noise analysis is required. None of the receptors within the study corridor meet the criteria to qualify as a Type 1 project. The project scope does not include the construction of noise abatement for existing conditions therefore, the project does not qualify as a Type 2 project. The Greenbag Road project qualifies as a Type 3 project. As stated in the project description, the work associated with the project includes roadway corridor improvements that enhance corridor safety and usability for bicyclists, pedestrians, and motorists. Due to the lack of any Type 1 or 2 criteria which would affect a receptor in the vicinity of the project corridor, it has been determined that project will not require any further noise analysis.

APPENDIX A
Project Location Map



MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Project Location Map

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Topography Source:
National Geographic Society (NGS)

Noise Study Boundary

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

Date: 11/14/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV1\Maps\Noise Project Location Map.mxd

APPENDIX B
Noise Impact Study Map

NSA 1

NSA 2

NSA 3

NSA 4

405'

90'

78'

51'

67'

207'

377'

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 1, NSA 2, NSA 3

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

MARKOSKY

N W E S

0 100 200 400 Feet

0 25 50 100 Meters

- Proposed Distance
- Existing Distance
- Proposed Edge of Pavement
- Proposed Fill Limit
- Proposed Cut Limit
- Noise Study Area
- Noise Study Boundary

Date: 11/26/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV1.Maps\Noise Study Map.mxd



MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 4

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

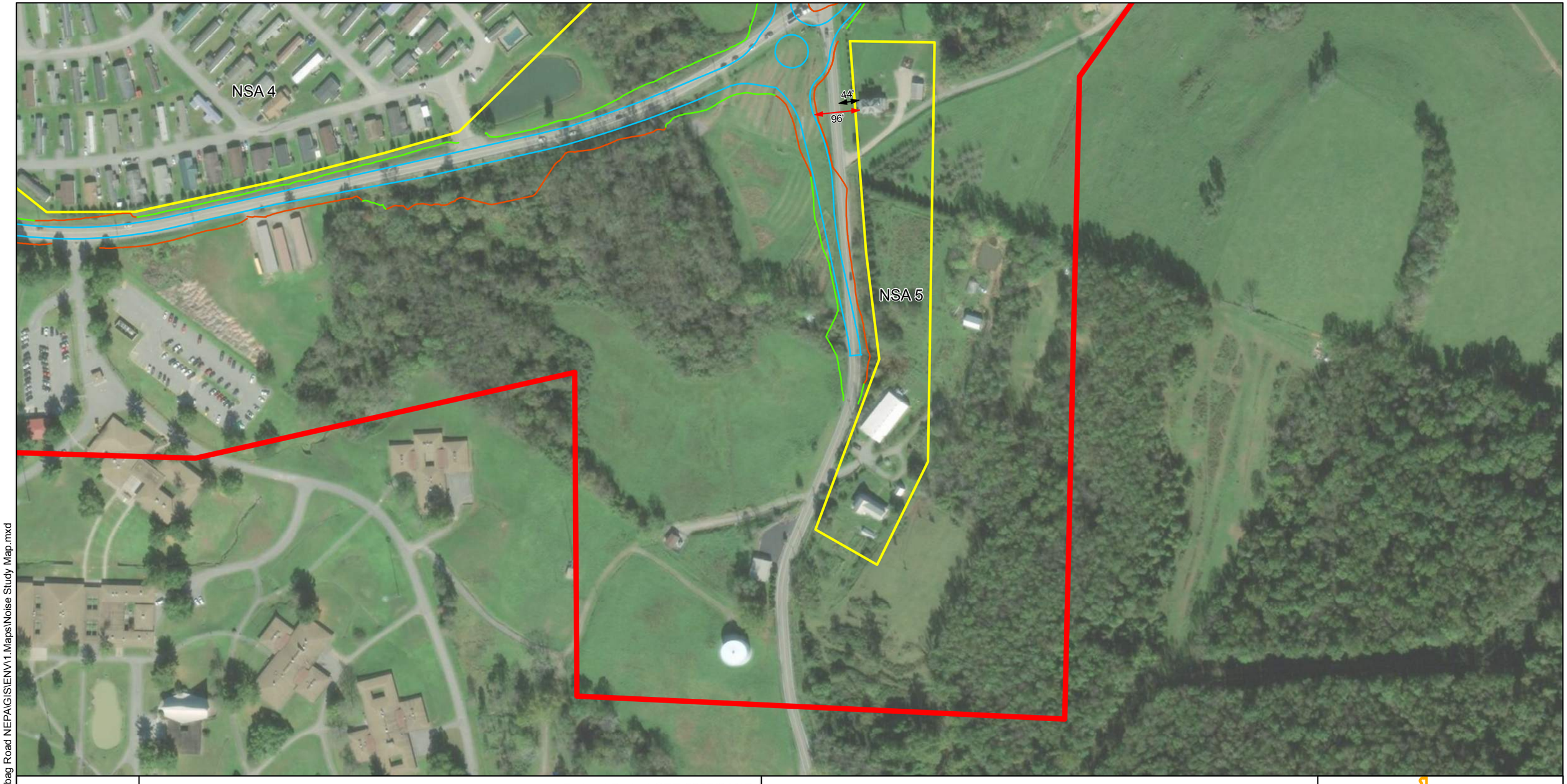
0 100 200 400 Feet

0 25 50 100 Meters

- Proposed Distance
- Existing Distance
- Proposed Edge of Pavement
- Proposed Fill Limit
- Proposed Cut Limit
- Noise Study Area
- Noise Study Boundary

Date: 11/26/2019

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MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 5

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

0 100 200 400 Feet

0 25 50 100 Meters

Proposed Distance
Existing Distance
Proposed Edge of Pavement
Proposed Fill Limit
Proposed Cut Limit
Noise Study Area
Noise Study Boundary

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV\1.Maps\Noise Study Map.mxd

Date: 11/26/2019



MARKOSKY

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 6, NSA 7

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

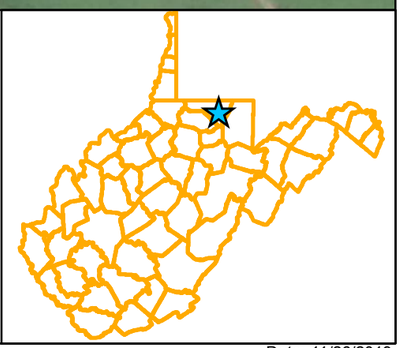
Aerial Photography Source:
World Imagery (ESRI)

N W E S

0 100 200 400 Feet

0 25 50 100 Meters

- Proposed Distance
- Existing Distance
- Proposed Edge of Pavement
- Proposed Fill Limit
- Proposed Cut Limit
- Noise Study Area
- Noise Study Boundary



Date: 11/26/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV1.Maps\Noise Study Map.mxd



Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 8, NSA 9, NSA 10

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

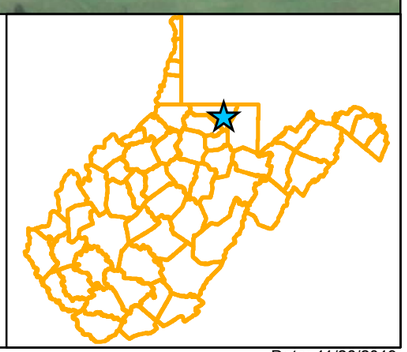
MARKOSKY

N W E S

0 100 200 400 Feet

0 25 50 100 Meters

- Proposed Distance
- Existing Distance
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- Proposed Fill Limit
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- Noise Study Area
- Noise Study Boundary



Date: 11/26/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV\1.Maps\Noise Study Map.mxd

NSA 11

NSA 10

NSA 12

NSA 8

NSA 9

46'

57'

33'

45'

60'

Greenbag Road Improvement Project
West Virginia Division of Highways
Monongalia County, West Virginia
USGS Quadrangle - Morgantown South
Noise Impact Study Map
NSA 11, NSA 12

Federal Project STP-0857(019)D
State Project U331-857-0.67 00

Aerial Photography Source:
World Imagery (ESRI)

MARKOSKY

N W E S

0 100 200 400 Feet

0 25 50 100 Meters

Proposed Distance

Existing Distance

Proposed Edge of Pavement

Proposed Fill Limit

Proposed Cut Limit

Noise Study Area

Noise Study Boundary

Date: 11/26/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV\1.Maps\Noise Study Map.mxd

Greenbag Road Improvement Project

Appendix D

Agency Coordination

RECEIVED
MAR 11 2019
ENGINEERING
DIVISION

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Elkins Operations Center
738 Ward Rd., PO Box 67
Elkins, WV 26241
Telephone 304-637-0245
Fax 304-637-0250

Stephen S. McDaniel
Director

March 7, 2019

Mr. Ben Hark
Division of Highways
Engineering Division
1334 Smith Street
Charleston, WV 25301

Dear Mr. Hark:

We have reviewed Natural Heritage Program files for information on rare, threatened and endangered (RTE) species and natural trout streams for the areas of the proposed highway projects:

TW	State Project S311-22-0.00 Revere Deck Girder Gilmer County	There are no known occurrences of any RTE species or natural trout streams within the project area.
RE, SM TC, SB	State Project S310-13-0.0200 Federal Project BR-0013-(039)E Kanawha Falls Bridge Project Fayette County	There are no known occurrences of any RTE species or natural trout streams within the project area. A mussel survey is required.
TBM	State Project T224-ECL/PS-0.00 Eclipse Bottom Bridge McDowell County	There are no known occurrences of any RTE species or natural trout streams within the project area. Surveys for mussels and the Big Sandy crayfish are required.
RE	State Project 40-38/1-0.03 McClanahan Bridge Replacement Putnam County	There are no known occurrences of any RTE species or natural trout streams within the project area. It has been noted that the mussel survey has been completed, and has received WVDNR clearance.
SB	State Project U331-857-0.67 00 Federal Project NFA 2317(022)D Greenbag Road Improvement Monongalia County	There are no known occurrences of any RTE species or natural trout streams within the project area. A mussel survey will be required if any in-stream work is anticipated in Cobun Creek.

From: Burke, Sydney T <Sydney.T.Burke@wv.gov>
Sent: Friday, December 13, 2019 12:31 PM
To: Karen Reed
Cc: Cummings, Traci L
Subject: FW: U331-857-0.67 Greenbag Rd. Improvement Project, Morgantown Monongalia County

FYI

From: Wakeford, Anne M <Anne.M.Wakeford@wv.gov>
Sent: Monday, December 9, 2019 1:19 PM
To: Burke, Sydney T <Sydney.T.Burke@wv.gov>
Cc: Bennett, Danny A <Danny.A.Bennett@wv.gov>
Subject: U331-857-0.67 Greenbag Rd. Improvement Project, Morgantown Monongalia County

Following are my original comments regarding this project.

Anne

From: Wakeford, Anne M
Sent: Wednesday, April 10, 2019 4:11 PM
To: Lowther, Chad S; Cummings, Traci L
Cc: Bennett, Danny A; Wellman, David I; Elliott, Danielle A; Clayton, Janet L
Subject: Greenbag Rd. PIE Study Preliminary fields reivew

Dear Chad Lowther,

Thank you for the opportunity to review the Greenbag road project, Morgantown, Monongalia County.

The coordinates you provided: Start 39 36 31N 79 57 35 W and End 39 36 35 N 79 56 31 W

show that the road will cross Corbin Creek, a high quality warmwater stream.
If you wish to perform in channel work from to April 1 to June 30 a request for a spawning waiver must be made to the WV Coordination Unit (304)637-0245 Danielle.A.Elliott@wv.gov

According to Traci Cummings, “The location of the crossing of the road at Corbin Creek is approximately at 39.608339, -79.955212.
WVDOH is planning on doing a mussel survey there summer. The habitat looks marginal and has been dry when we’ve been there before.”

I will not be attending the preliminary field review on Tuesday April 16.

Please contact me if you have any questions.

Regards,

Anne

Anne M. Wakeford

Anne M. Wakeford
Coordination Biologist
WV DNR Elkins Operation Center
PO Box 67 Ward Rd
Elkins WV 26241
Email: Anne.M.Wakeford@wv.gov
Phone 304-637-0245 ex 2035
Fax 304-637-0250

WEST VIRGINIA
Division of Culture and History

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300
Randall Reid-Smith, Commissioner
Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562
EEO/AA Employer

November 19, 2019

Mr. Ben L. Hark
Environmental Section Head
Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25305

RE: Greenbag Road Improvement Project – Phase I Archaeological Survey Report
State Project No. U331-857-0.067; Federal Project No. STP-0857(019)D
FR: 20-203-MG

Dear Mr. Hark:

We have reviewed the Phase I archaeological survey report that was submitted for the above-referenced project to determine any effects it may have on cultural resources. As required by Section 106 of the National Historic Preservation Act of 1966, as amended, its implementing regulations, 36 CFR 800: "Protection of Historic Properties," we submit our comments.

According to the report, the West Virginia Department of Transportation, Division of Highways is proposing improvements to Greenbag Road in Monongalia County. The proposed improvements include widening lanes and shoulders and constructing a dedicated center turn lane along a section of road beginning at the intersection of Greenbag Road (CR 857) and US 119 and continuing to where Greenbag Road crosses Aaron Creek. A curb and gutter will also be installed along the west side of the road. Because project plans have not been finalized, a study area was delineated that attempted to encompass all areas proposed for ground disturbance.

Archaeological survey of the study area included pedestrian reconnaissance and the excavation of shovel test pits and one test unit. Approximately 40.39 acres of the APE exhibited steeply sloped terrain and/or extensive prior disturbance. The remaining 8.94 acres underwent shovel test pit excavation. A total of 213 shovel test pits and one test unit were excavated across 12 test areas. The test pits variably encountered fill deposits and intact soils. No archaeological sites were identified. As a result, we concur that no further archaeological investigations are warranted. We also concur that no archaeological historic properties are present within the study area as currently defined.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the Section 106 process, please contact Lora A. Lamarre-DeMott, Senior Archaeologist, at (304) 558-0240.*

Sincerely,

Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/LLD

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

February 21, 2019

Mr. Brian Bridgewater
Water Resources Section
Department of Environmental Protection
601 57th Street East
Charleston, West Virginia 25304

Dear Mr. Bridgewater:

State Project U331-857-0.67 00
Federal Project NFA 2317(022)D
Greenbag Road Improvement
Monongalia County

The Division of Highways is developing the subject project at the location shown on the attached vicinity maps. The project begins 0.40 miles east of the intersection of Greenbag Road (CR 857) and US 119 and ends 0.36 miles east of the intersection of Greenbag Road (CR 857) and Kingwood Pike/Dorsey Avenue at Jonathan Lane. The improvements to Greenbag Road include shoulder and lane widening, the addition of a sidewalk along the right side of the road, and improving both the Mississippi Street and the Dorsey Avenue/Kingwood Pike intersections. The box culvert carrying Greenbag Road over Cobun Creek will be replaced with a wider box culvert to accommodate the widened roadway.

The project will include work on four other intersecting roadways: Mississippi Street, Dorsey Avenue, Kingwood Pike, and Luckey Lane. On Mississippi Street, the project will widen the travel lane and improve the intersection with Greenbag Road. On Dorsey Avenue and Kingwood Pike the project will add a sidewalk and improve the intersection with Greenbag Road. On Luckey Lane, the project will improve the width of the travel lane within the existing right-of-way and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. The project falls on the USGS Morgantown South quadrangle (39.607165, -79.944962 DD).

The work will require takes for right-of-way, temporary construction easements, and permanent drainage easements along the route.

Traffic will be maintained during construction using single lane closures as needed.

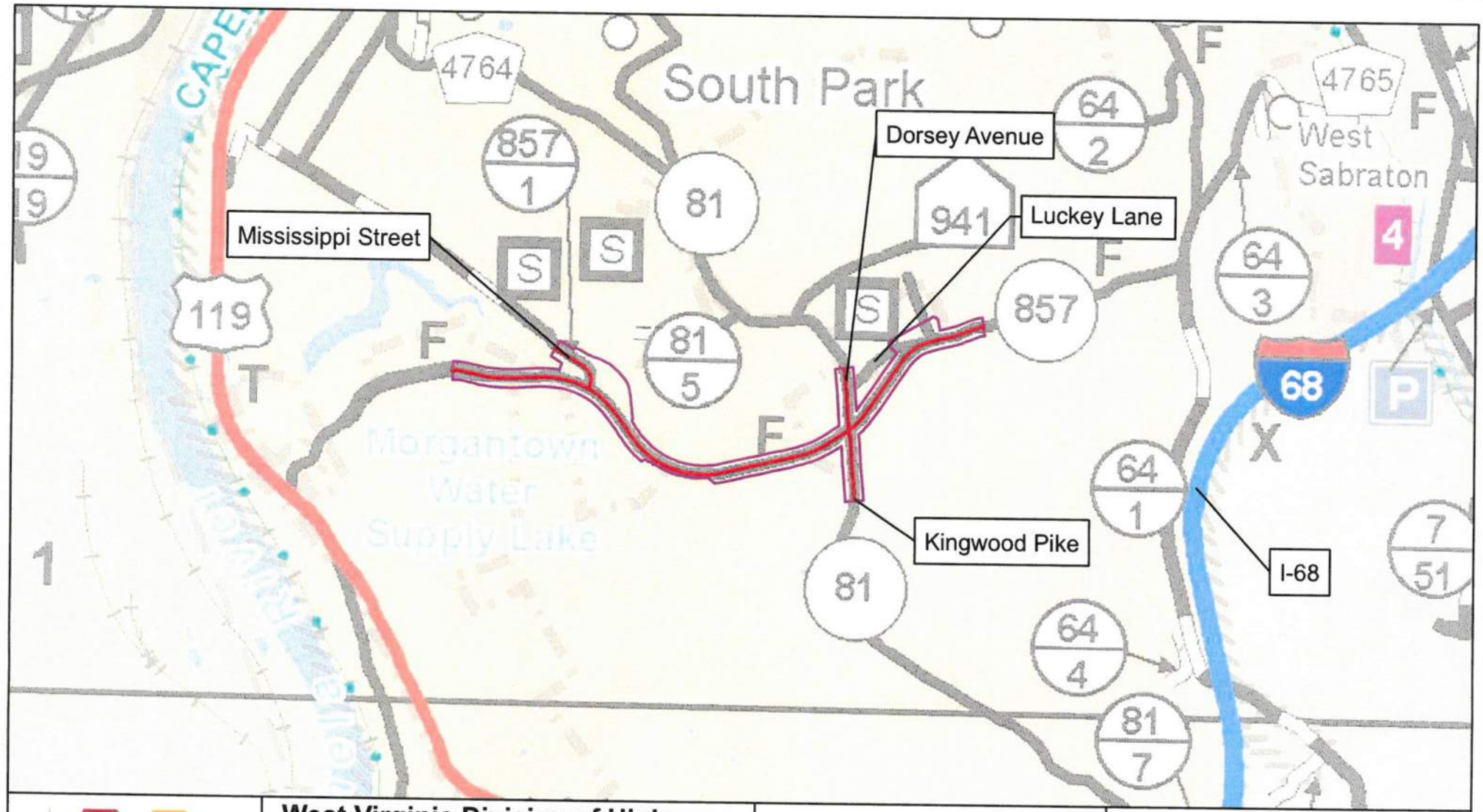
Your comments on possible water quality impacts are requested so that they may be included in our environmental studies. Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 558-9666.

Yours very truly,

Ben L Hark

Ben L. Hark
Environmental Section Head
Engineering Division

H:b
Attachments
Bcc: DDE(SB)



MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Base Map Source: WV DOH GIS County Maps

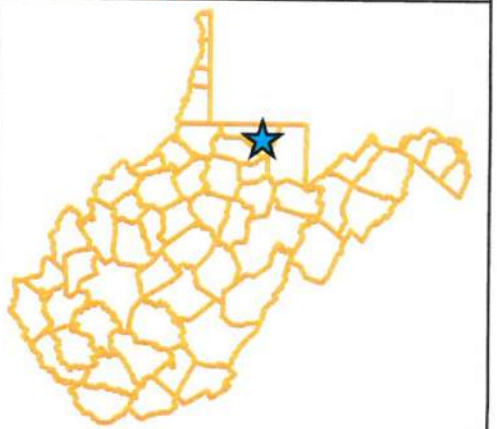
Project Alignment

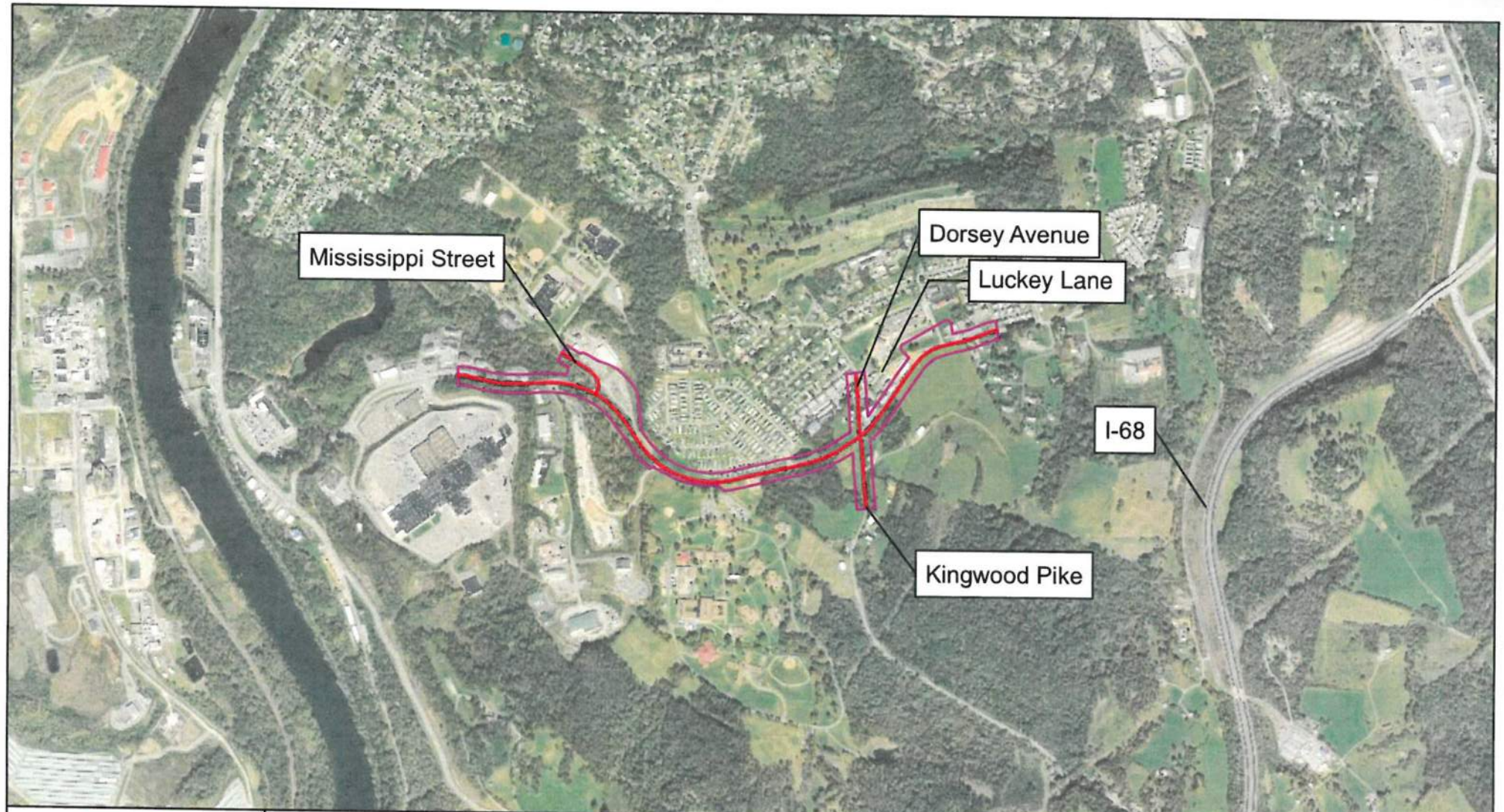
Environmental Footprint

N W E S

0 1,000 2,000 4,000 Feet

0 350 700 1,400 Meters





MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Aerial Photography Source: World Imagery (ESRI)

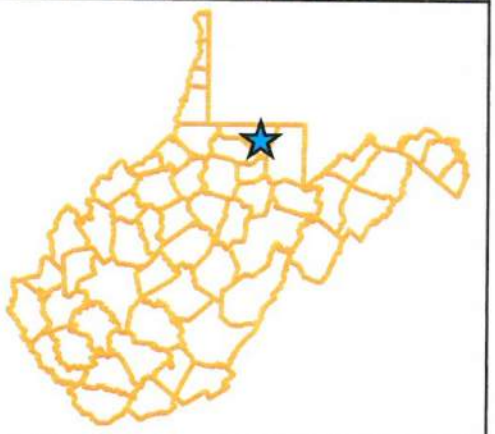
Project Alignment

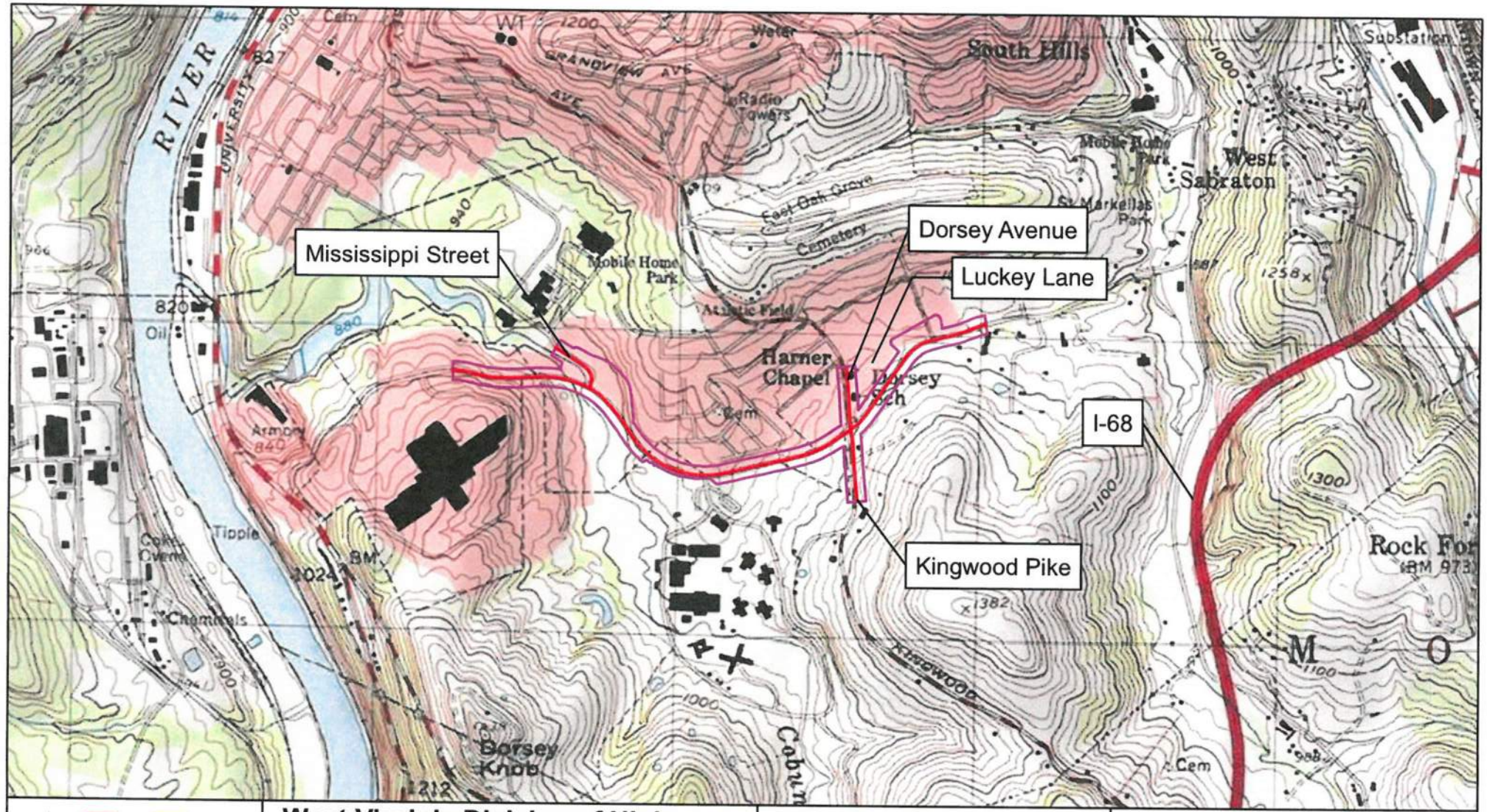
Environmental Footprint

N W E S

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0 350 700 1,400 Meters





MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Topography Source: National Geographic Society (NGS)

N
W E
S

0 1,000 2,000 4,000 Feet

0 350 700 1,400 Meters

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

February 21, 2019

Ms. Barbara Sargent
West Virginia Division of
Natural Resources
Post Office Box 67
Elkins, West Virginia 26241

Dear Ms. Sargent:

State Project U331-857-0.67 00
Federal Project NFA 2317(022)D
Greenbag Road Improvement
Monongalia County

The Division of Highways is developing the subject project at the location shown on the attached vicinity maps. The project begins 0.40 miles east of the intersection of Greenbag Road (CR 857) and US 119 and ends 0.36 miles east of the intersection of Greenbag Road (CR 857) and Kingwood Pike/Dorsey Avenue at Jonathan Lane. The improvements to Greenbag Road include shoulder and lane widening, the addition of a sidewalk along the right side of the road, and improving both the Mississippi Street and the Dorsey Avenue/Kingwood Pike intersections. The box culvert carrying Greenbag Road over Cobun Creek will be replaced with a wider box culvert to accommodate the widened roadway.

The project will include work on four other intersecting roadways: Mississippi Street, Dorsey Avenue, Kingwood Pike, and Luckey Lane. On Mississippi Street, the project will widen the travel lane and improve the intersection with Greenbag Road. On Dorsey Avenue and Kingwood Pike the project will add a sidewalk and improve the intersection with Greenbag Road. On Luckey Lane, the project will improve the width of the travel lane within the existing right-of-way and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. The project falls on the USGS Morgantown South quadrangle (39.607165, -79.944962 DD).

The work will require takes for right-of-way, temporary construction easements, and permanent drainage easements along the route.

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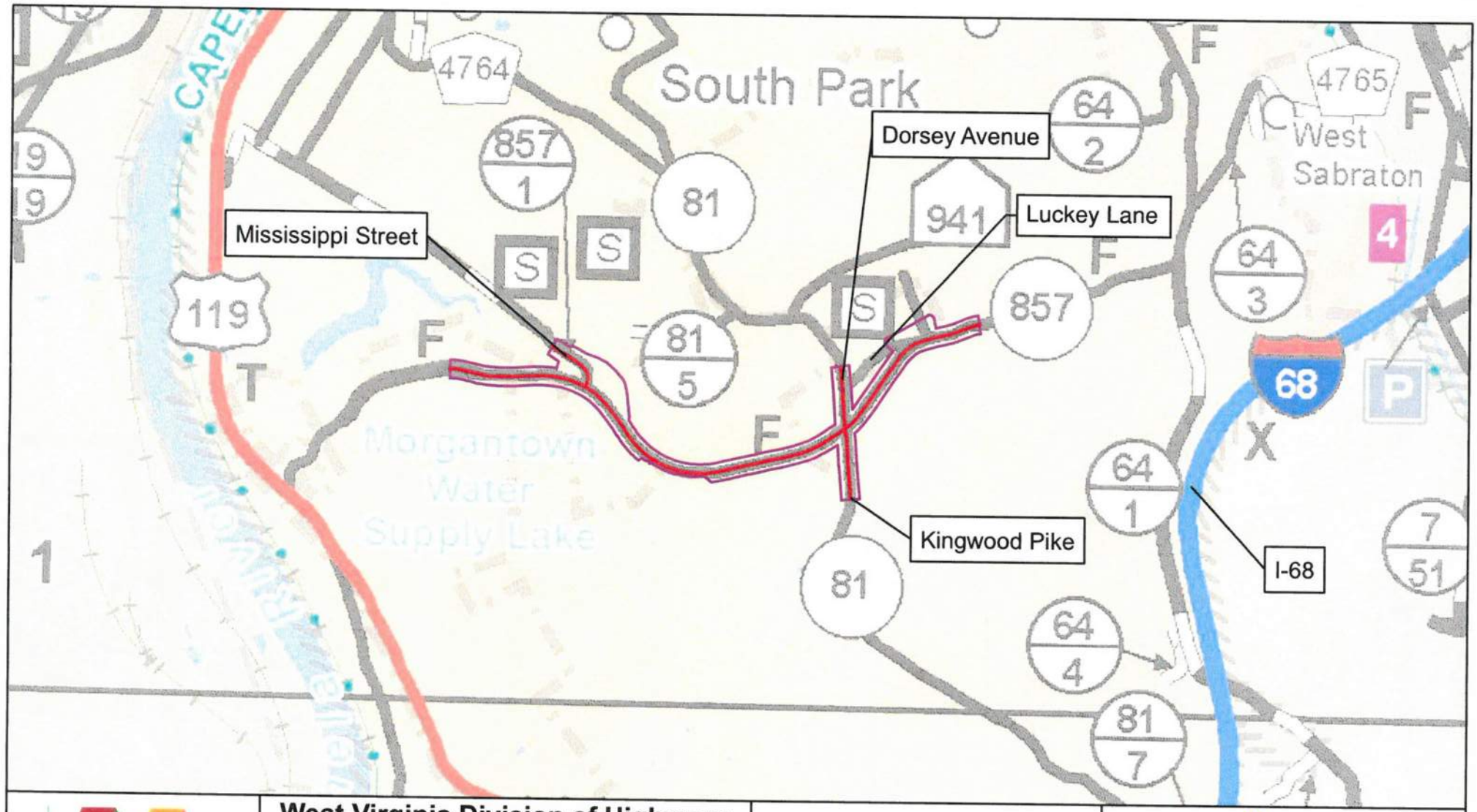
Your comments on rare or endangered species and natural trout streams are requested so that they may be included in our environmental studies. Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 558-9666.

Yours very truly,

Ben L. Hark

Ben L. Hark
Environmental Section Head
Engineering Division

H:b
Attachments
Bcc: DDE(SB)



MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Base Map Source: WV DOH GIS County Maps

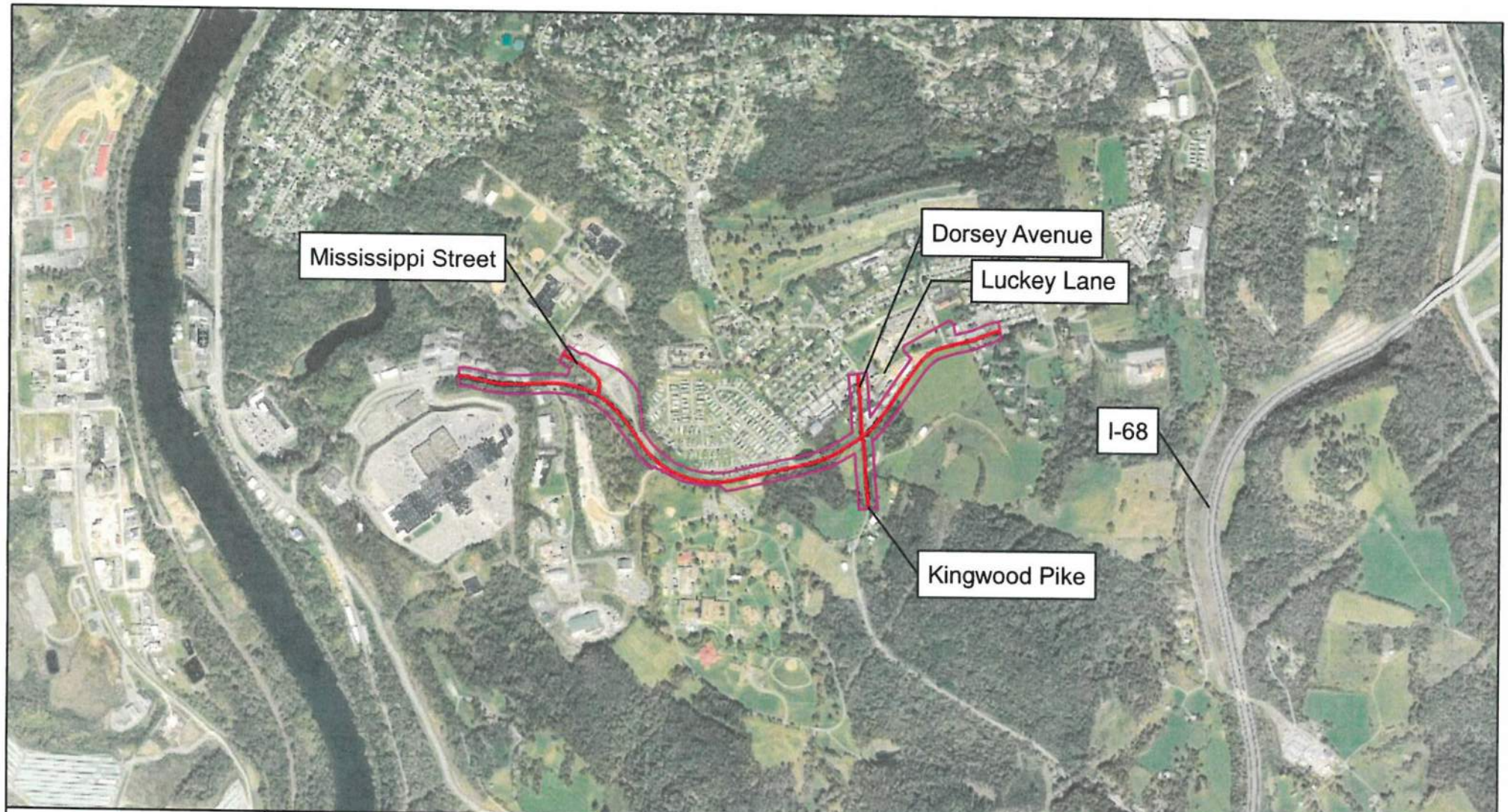
Project Alignment

Environmental Footprint

N W E S

0 1,000 2,000 4,000 Feet

0 350 700 1,400 Meters



MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Aerial Photography Source: World Imagery (ESRI)

Project Alignment

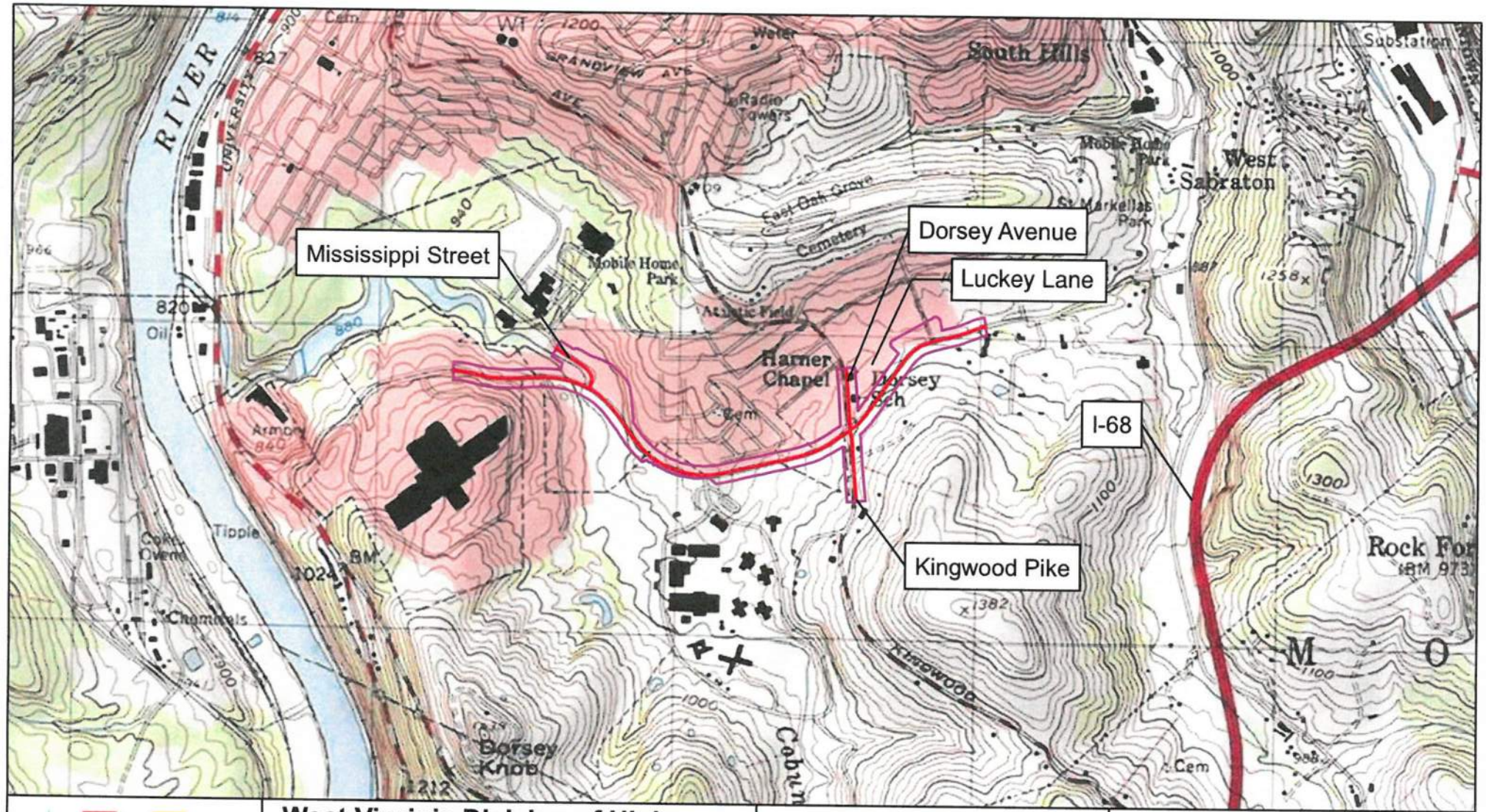
Environmental Footprint

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MARKOSKY

West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Topography Source: National Geographic Society (NGS)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Darby Clayton
D-4 District Manager/Engineer
WV Division of Highways
I-79 & Meadowbrook Road
Clarksburg, WV 26302-2570

Dear Mr. Clayton:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

The proposed project consists of the widening Greenbag Road lanes and providing intersection improvements at the Mississippi Street (CR 857/1) and Dorsey Avenue/ Kingwood Pike (CR81) intersections. The entire project length is approximately 1.65 miles in length and involves the replacement of one culvert structure over Cobun Creek. Attached are a project location map and the handout materials from the initial public meeting.

Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

E.E.O./AFFIRMATIVE ACTION EMPLOYER

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Barbara Evans Fleischauer
Member of the WV House of Delegates
Room 151R, Building 1
State Capitol Complex
Charleston, WV 25305

Dear Delegate Fleischauer:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

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Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

E.E.O./AFFIRMATIVE ACTION EMPLOYER

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Evan Hansen
Member of the WV House of Delegates
Room 150R, Building 1
State Capitol Complex
Charleston, WV 25305

Dear Delegate Hansen:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

The proposed project consists of the widening Greenbag Road lanes and providing intersection improvements at the Mississippi Street (CR 857/1) and Dorsey Avenue/ Kingwood Pike (CR81) intersections. The entire project length is approximately 1.65 miles in length and involves the replacement of one culvert structure over Cobun Creek. Attached are a project location map and the handout materials from the initial public meeting.

Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

William F. Durham
Director, Office of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304-2345

Dear Mr. Durham:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

The proposed project consists of the widening Greenbag Road lanes and providing intersection improvements at the Mississippi Street (CR 857/1) and Dorsey Avenue/ Kingwood Pike (CR81) intersections. The entire project length is approximately 1.65 miles in length and involves the replacement of one culvert structure over Cobun Creek. Attached are a project location map and the handout materials from the initial public meeting.

Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Austin Caperton, Cabinet Secretary
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Dear Secretary Caperton:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

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Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Brian Bridgewater
Water Resources Section
WV Department of Environmental Protection
601 57th Street
Charleston, WV 25304-2345

Dear Mr. Bridgewater:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

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Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
Attachments
bcc: DDE(SB)

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Scott G. Mandirola
Director, Division of Water and Waste Management
Permitting and Engineering Branch
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304-2345

Dear Mr. Mandirola:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. The project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019 the project has been changed to an Environmental Assessment due to public comment and FHWA recommendation. We request your input as to any concerns your office may have regarding this project.

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E.E.O./AFFIRMATIVE ACTION EMPLOYER

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Stephen S. McDaniel, Director
West Virginia Division of Natural Resources
324 Fourth Avenue
South Charleston, WV 25303

Dear Mr. McDaniel:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Danny Bennett
West Virginia Division of Natural Resources
P.O. Box 67
Elkins, WV 26241

Dear Mr. Bennett:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Mary Ann Tierney
Regional Administrator
Federal Emergency Management Agency
Region III
615 Chestnut Street
Philadelphia, PA 19106

Dear Ms. Tierney:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

William A. Kawecki, Mayor
City of Morgantown
389 Spruce Street
Morgantown, WV 26505

Dear Mayor Kawecki:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Rennetta McClure
County Administrator
Monongalia County Commission
243 High Street Room 202
Courthouse
Morgantown, WV 26505

Dear Ms. McClure:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Ben L. Hark
Section Head
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Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Paul Brake
Morgantown City Manager
389 Spruce Street
Morgantown, WV 26505

Dear Mr. Brake:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Very truly yours,

Ben L. Hark
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Environmental Section
Engineering Division

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Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Bill Austin
Morgantown/Monongalia MPO
243 High Street Room 110
Morgantown, WV 26505

Dear Mr. Austin:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Robert Beach
Member of the WV Senate
Room 204W, Building 1
State Capitol Complex
Charleston, WV 25305

Dear Senator Beach:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Environmental Section
Engineering Division

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Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Roman Prezioso
Member of the WV Senate
Room 245M, Building 1
State Capitol Complex
Charleston, WV 25305

Dear Senator Prezioso:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Ben L. Hark
Section Head
Environmental Section
Engineering Division

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Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Susan Pierce
Deputy State Historic Preservation Officer
Division of Culture and History
1900 Kanawha Blvd East
Charleston, WV 25305

Dear Ms. Pierce:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Ben L. Hark
Section Head
Environmental Section
Engineering Division

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E.E.O./AFFIRMATIVE ACTION EMPLOYER

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Michael E. Hatten
Chief Regulatory Division
U.S. Army Corps of Engineers - Huntington District
CELRH-RD
502 Eighth Street
Huntington, WV 25701-2070

Dear Mr. Hatten:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Environmental Section
Engineering Division

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E.E.O./AFFIRMATIVE ACTION EMPLOYER

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
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Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Environmental Coordinator
United States Department of Agriculture
Natural Resources Conservation Service
1150 Earl L. Core Road, Suite 200
Morgantown, WV 26505

Dear Coordinator:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Willie R. Taylor
Director, Office of Environmental Policy and Compliance
U.S. Department of Interior
1849 C. Street, NW (MS2462)
Washington, D.C. 20240

Dear Mr. Taylor:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Ben L. Hark
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Division of Highways
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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Samantha Beers, Director
Office of Community, Tribes, & Environmental Assessment
U.S. Environmental Protection Agency
Region III (3RA10)
1650 Arch St.
Philadelphia, PA 19103

Dear Ms. Beers:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

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Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

November 26, 2019

Ms. Elizabeth Stout
U.S. Fish and Wildlife Service
West Virginia Field Office
90 Vance Drive
Elkins, West Virginia 26241

Dear Ms. Stout:

State Project U331-857-0.67
Federal Project STP 0857(019)D
Greenbag Road Improvement Project
Morgantown, Monongalia County

Please be advised the West Virginia Division of Highways has initiated NEPA studies for the above referenced project. At this time it is anticipated that the level of documentation will be an Environmental Assessment, whereas in early 2019 the project was initially identified to be documented as a Programmatic Categorical Exclusion. Following a public meeting in April 2019, due to public comment, the project NEPA document was changed to an Environmental Assessment. We request your input as to any concerns your agency may have regarding this project.

The proposed project consists of the widening Greenbag Road lanes and providing intersection improvements at the Mississippi Street (CR 857/1) and Dorsey Avenue/Kingwood Pike (CR81) intersections. The entire project length is approximately 1.65 miles in length and involves the replacement of one culvert structure over Cobun Creek.

Attached please find an ArcView map and TOPO map showing the project location. After screening the project through our GIS Species Layers Running Buffalo Clover and state listed mussels are shown to possibly occur within the project location. On July 22, 2019, WVDOH Environmental Section staff reviewed the area for Running Buffalo Clover; no Running Buffalo Clover habitat was observed within the project area. If you have any comments or additional species that need to be considered please let us know.

The project will impact up to 7 acres of forested land depending on the alternative that will be selected. Due to the project alternatives all remaining below the 17 acres of forested land impacts and that the project is not located within a known bat zone, the WVDOH requests confirmation that no commitments to winter clearing are required for the project.

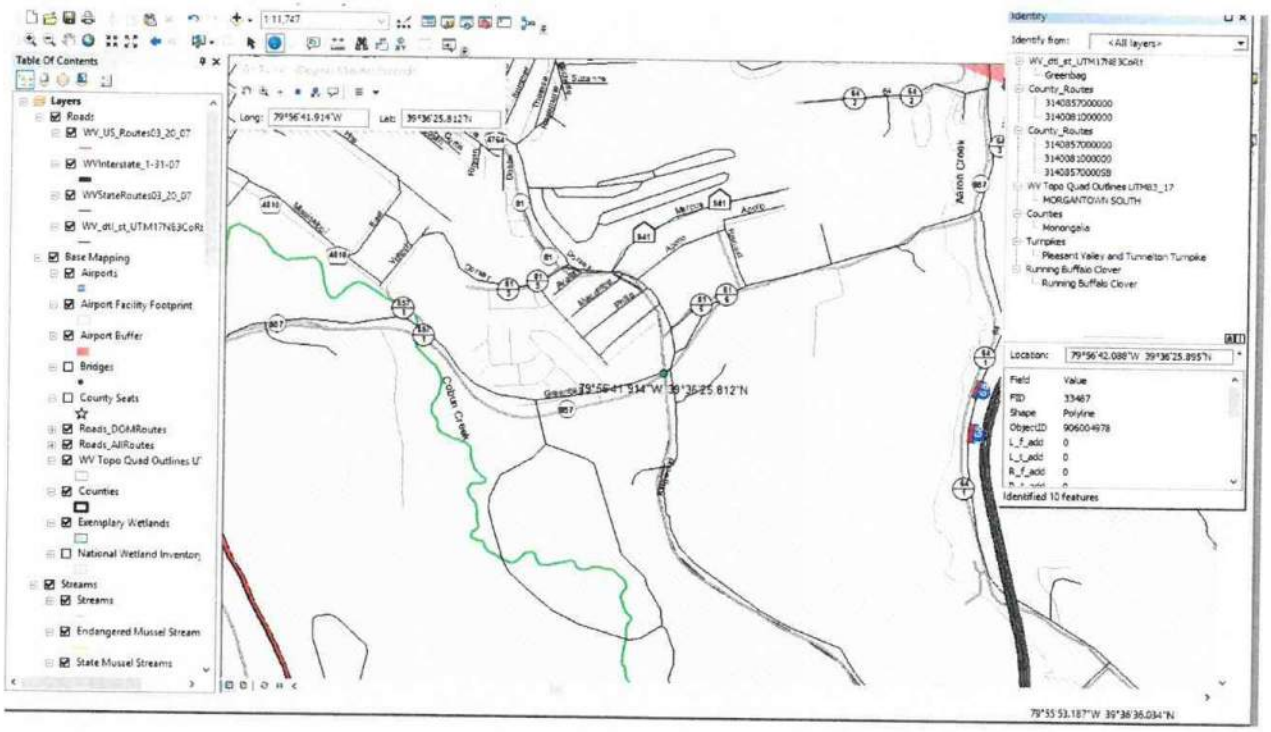
At this time we are asking you to concur with our plan of action and that our species list is correct. Should you require additional information, please contact Sydney Burke of our Environmental Section at (304) 414-6420 or Sydney.T.Burke@wv.gov.

Very truly yours,

Ben L Hark

Ben L. Hark
Section Head
Environmental Section
Engineering Division

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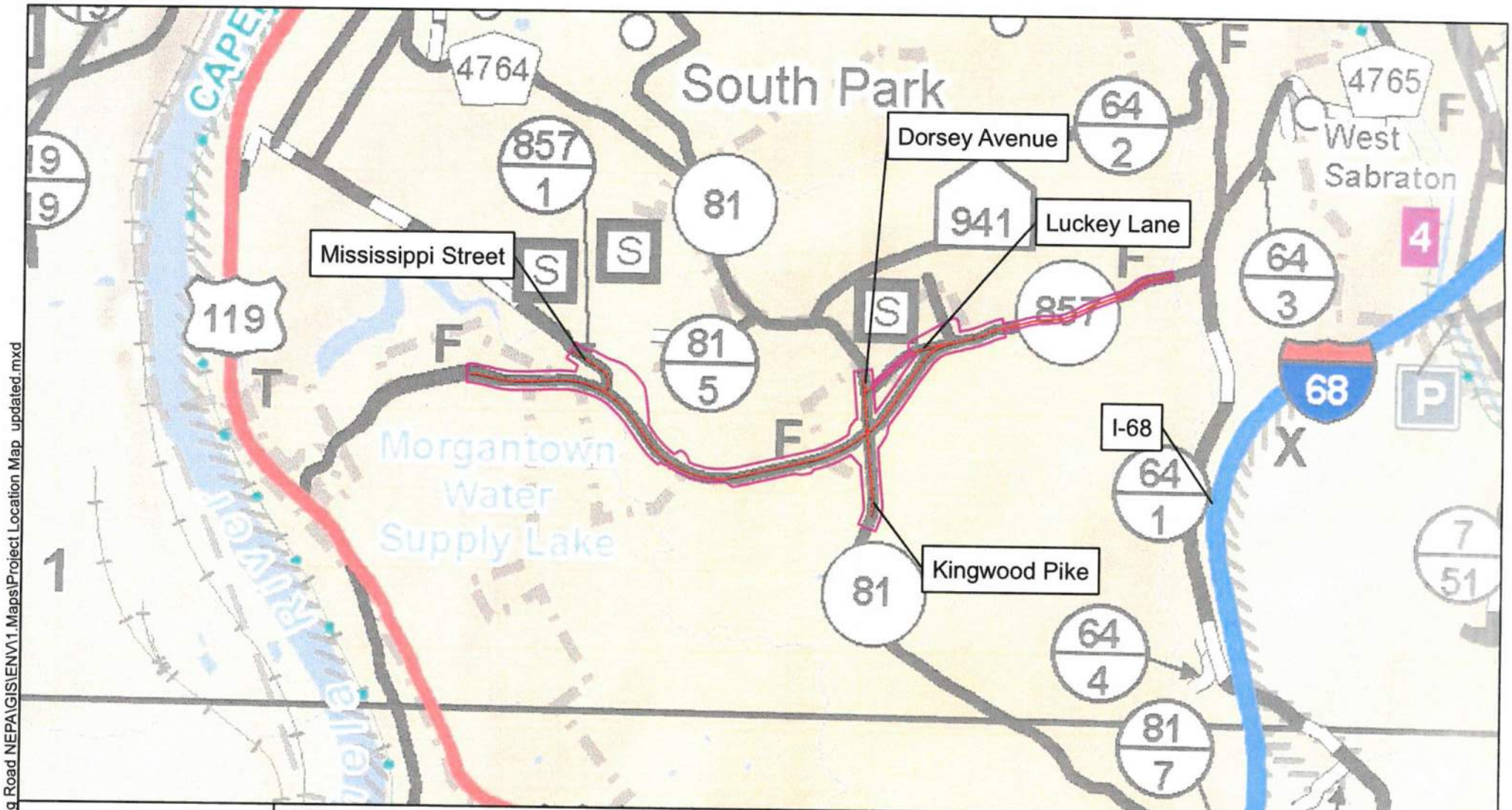
10/10/2019

Greenbag Road
U331-857-0.67 00
NFA-2317(022)D
Monongalia County
39.607170, -79.944976 DD

Zone 7 – Running Buffalo Clover, no suitable habitat

Within ¼ and ½ mile buffers of state listed mussel stream – mussel survey 7/22/2019, no mussels

Morgantown South Quad



MARKOSKY

West Virginia Division of Highways
Federal Project STP 0857(019)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Topography Source: National Geographic Society (NGS)

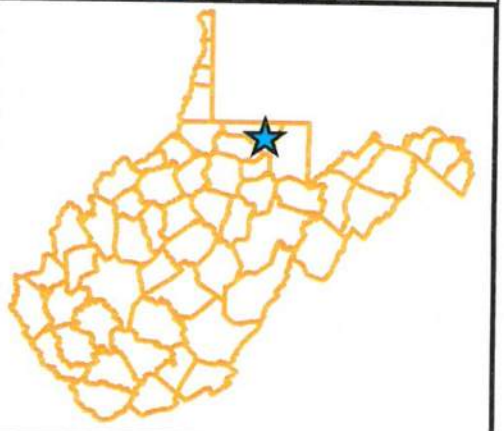
Project Alignment

Environmental Footprint

N W E S

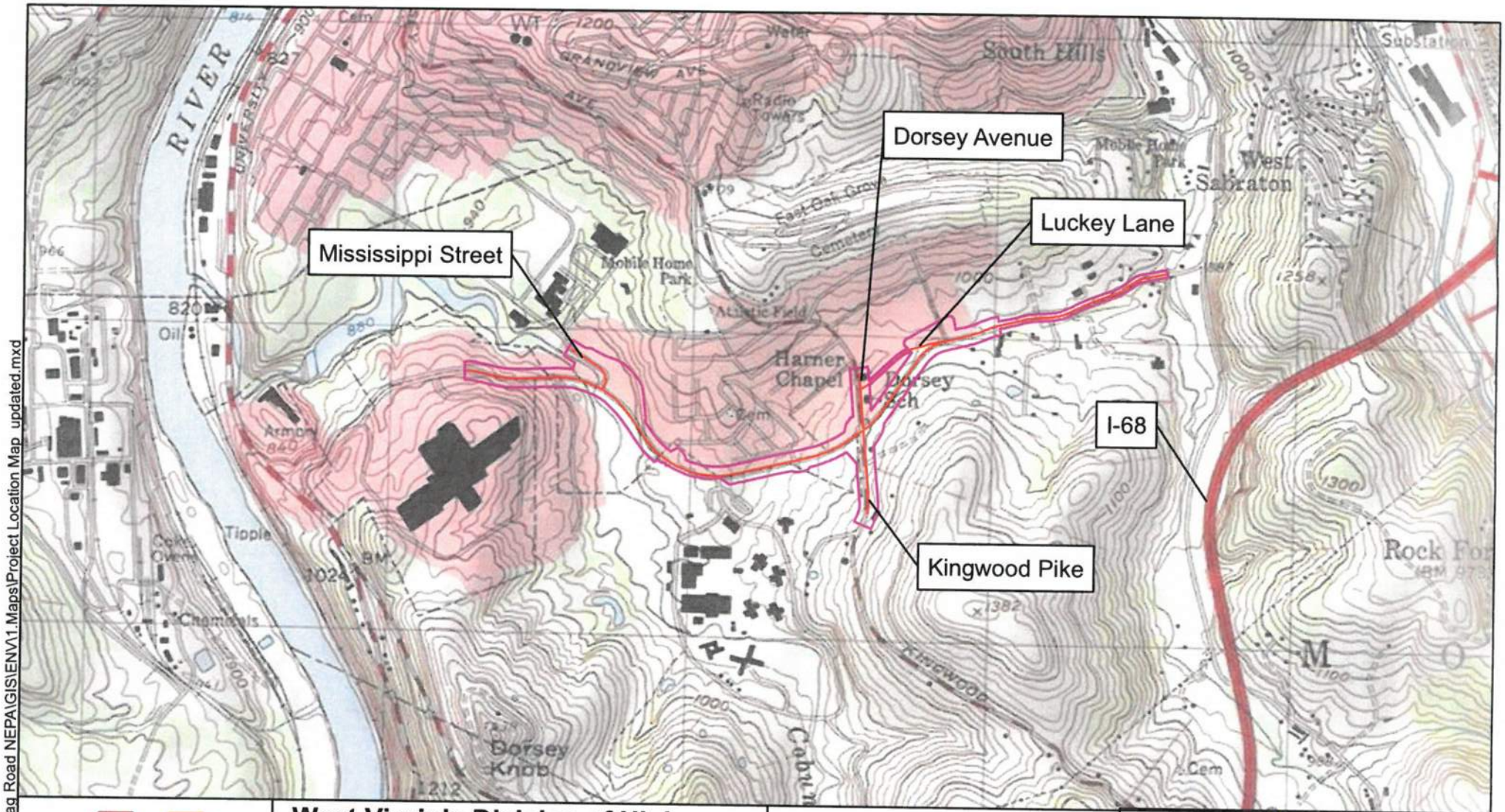
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Date: 11/21/2019

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MARKOSKY

West Virginia Division of Highways
Federal Project STP 0857(019)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

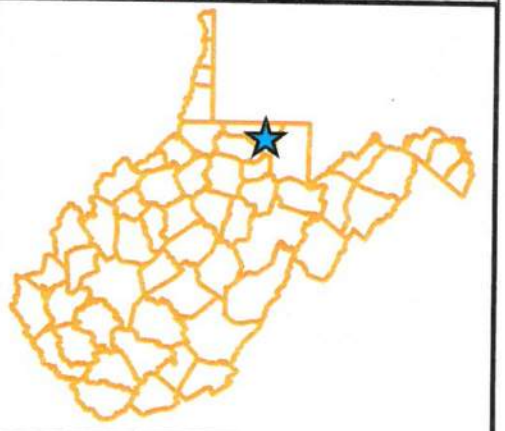
Topography Source: National Geographic Society (NGS)

Project Alignment

Environmental Footprint

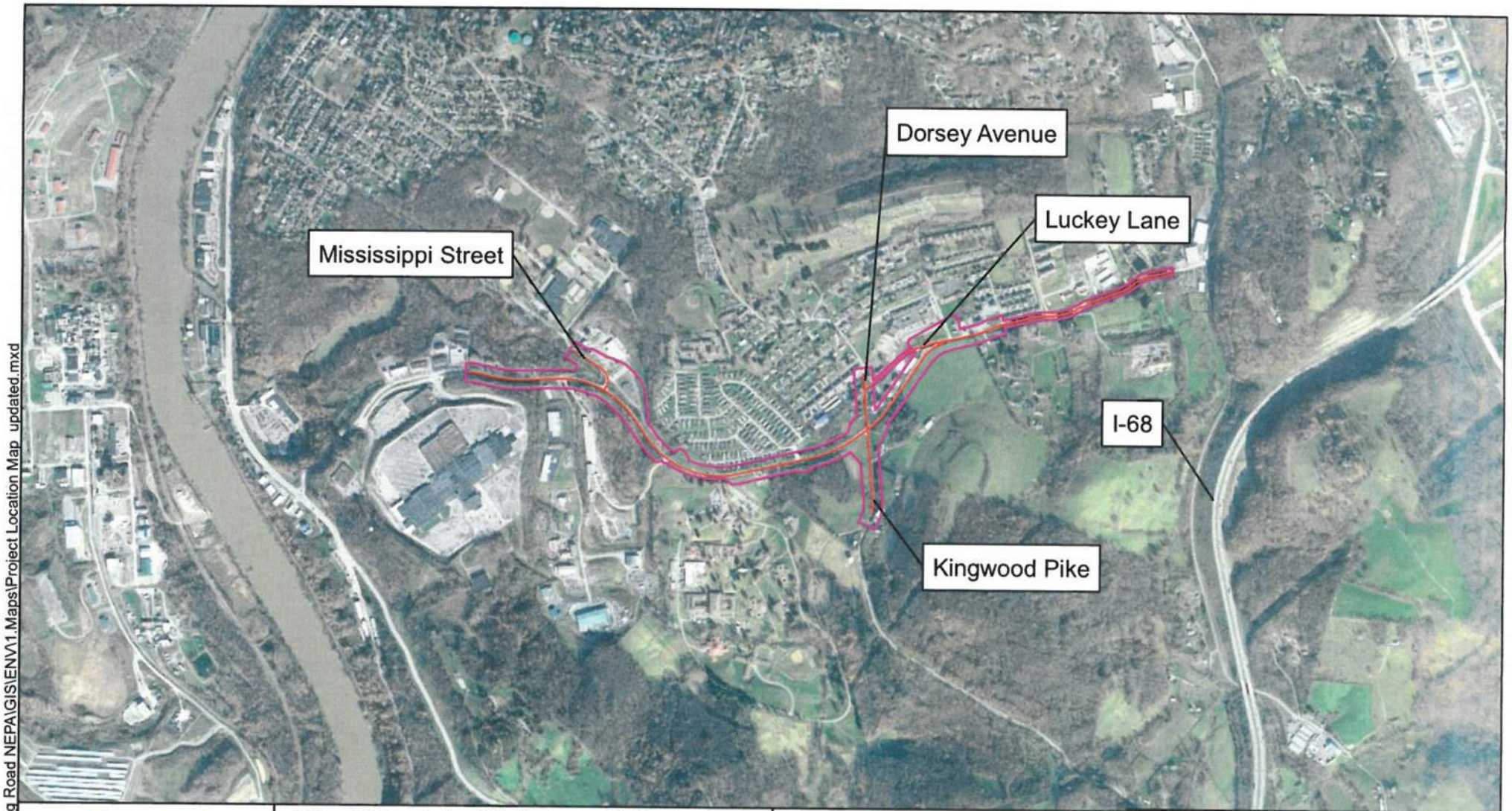
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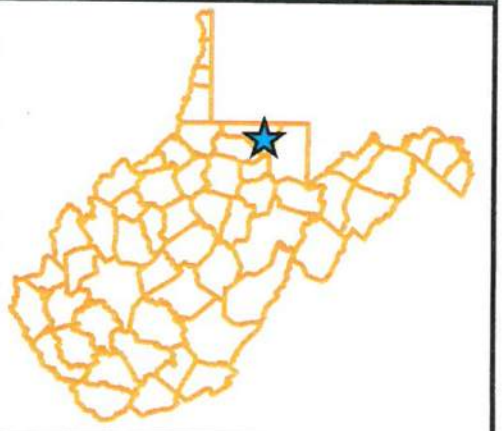
West Virginia Division of Highways
Federal Project STP 0857(019)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

Topography Source: National Geographic Society (NGS)

Project Alignment
Environmental Footprint

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0 350 700 1,400 Meters



Date: 11/21/2019

Document Path: G:\18-062 WVDOH Greenbag Road NEPA\GIS\ENV1.Maps\Project Location Map_updated.mxd

GREENBAG ROAD IMPROVEMENT PROJECT

State Project U331-857-0.67
Federal Project NFA-2317 (022) D
Monongalia County, West Virginia

PUBLIC MEETING

Tuesday, April 16, 2019

WELCOME!

Thank you for participating in the public informational workshop for the Greenbag Road Improvement Project in Morgantown, WV. This meeting is being hosted by the West Virginia Division of Highways (WVDOH) to present the preliminary designs for the project and to collect public opinion and comments on the plans. We invite you to browse the displays and encourage discussions with the project team. There will be **no formal presentation** during the meeting. There is a comment sheet available on the final page of this handout. Please submit your comments at the meeting, by mail, or via the WVDOH website at http://go.wv.gov/dotcomment.

This meeting complies with the public involvement requirements of the National Environmental Policy Act and Section 106 of the National Historic Preservation Act.

PROJECT BACKGROUND AND PURPOSE

The project is based on a study by the Morgantown Monongalia MPO (MMMPO) Unified Working Program (FY2014-2015). The overall goal of the study was to identify ways to improve Greenbag Road (CR 857) as an alternative truck route to reduce and/or eliminate trucks from traveling through downtown Morgantown by providing a safer, continuous route from WV 7 to US 119. The study reviewed the roadway from the intersection with WV 7 to the intersection with US 119. Recommendations from the study included roadway improvements, intersection improvements, multi-modal improvements, and on-going monitory of safety and development. Specific proposed projects were to widen and resurface Greenbag Road and provide shoulders along both sides; adding turn lanes and optimizing signals at the Dorsey Ave/Greenbag Road intersection and the US119/Greenbag Road intersection; and provide a sidewalk along the north side of Greenbag Road to increase pedestrian safety.

The current project will improve and upgrade the Dorsey Ave/Greenbag Road intersection, widen and resurface Greenbag Road from just west of Mississippi Street to Jonathan Lane, and provide a sidewalk and shoulders along Greenbag Road, as identified in the MMMPO study. These improvements will address several of the major issues identified in the study including: inadequate turning radius and intersection delays at Dorsey Ave/Greenbag Road; limited sight distance at Mississippi Street/Greenbag Road; and the lack of safe non-motorized facilities connecting the neighborhoods along the corridor.

PROJECT DESCRIPTION



The current project extends from ¼ mile west of the Mississippi Street intersection along Greenbag Road (CR 857) to the intersection with Jonathan Lane, approximately 1/10 mile east of Luckey Lane and includes intersection improvements at Mississippi Street (CR 857/1) and at Dorsey Avenue/Kingwood Pike (CR 81). These intersection improvements will increase the overall traffic capacity of Greenbag Road (CR 857) between WV 7 and US 119.

The overall roadway improvements include wider lanes and shoulders along with a dedicated center turn lane prior to the Mississippi Avenue intersection. A curb and gutter will be installed along the west side of Greenbag Road to help address drainage issues and to provide a sidewalk along the entire route to the Dorsey Avenue/Kingwood Pike intersection. In addition, the west side shoulder will be utilized as a shared bike lane for the corridor between the commercial district and the residential areas. The sidewalks and crosswalks will provide a safer route for pedestrian traffic from the current commercial area to the numerous residential areas located along Greenbag Road.

The two major intersections will be reconstructed as a single lane roundabouts to provide for continuous traffic flow and to increase the safety of the traveling public as they enter each intersection. The roundabouts have been selected instead of signalized intersections based on traffic analysis and level of service. The roundabouts will also be developed to allow the safe movement of pedestrians along the sidewalk on the west side of Greenbag Road and will include lighting on each approach to the roundabout.

The roadway improvements incorporate two 11-foot travel lanes with a 12-foot center turn lane with curb and gutter on each side up to Mississippi Street. Between Mississippi Street and Dorsey Avenue/Kingwood Pike, the roadway will be improved to two 12-foot travel lanes and a 4-foot paved east shoulder. A 3-foot paved shoulder with a curb and gutter will be on the west side. The 5-foot concrete sidewalk will be located along the entire corridor on the west side of Greenbag Road (CR 857).

Maintenance of Traffic during Construction

Traffic patterns will be temporarily impacted. A maintenance of traffic (MOT) plan will be in place to minimize delays, maintain access to residences and businesses, and maintain safety for travelers and construction workers. The proposed MOT plan will include either the use of a detour on existing roads or temporary signals or flaggers.

The Mississippi Street roundabout will be constructed adjacent to Greenbag Road. When the northern portion of the roundabout is complete, traffic will shift to the newly created approaches and through the constructed portion of the roundabout while the southern portion is constructed. Mississippi Street will remain open to traffic throughout the construction of the roundabout.

For the roundabout at Greenbag Road and Dorsey Ave/Kingwood Pike, construction will be completed in multiple stages to allow for continued access. The **proposed stages** are:

Stage 1 will widen the existing Greenbag Road between the entrance to Bluegrass Village and the intersection at CR 81 (Dorsey Ave/Kingwood Pike). The widening will take place on the north side of Greenbag Road. When complete, westbound traffic will shift onto the newly constructed roadway and eastbound traffic will utilize the existing westbound lanes.

Stage 2 will close Kingwood Pike and construct the southern approach and half of the east/west approaches to the roundabout. This will include the construction of the proposed retaining wall on the eastern approach.

Stage 3 will shift traffic to the newly created east/west approaches and through the constructed portion of the roundabout, then re-open Kingwood Pike. Dorsey Avenue will be closed and traffic will utilize Luckey Lane using temporary lights at both the Luckey Lane/Greenbag Road intersection and at Kingwood Pike and the re-aligned Greenbag Road.

Stage 4 will construct the north approach and the remaining east/west approach legs.

Stage 5 will open to traffic and install the islands while under traffic.

During Stage 2 when Kingwood Pike is closed, two detours will be posted. The **car detour** is 3.2 miles in length and requires approximately 10 minutes. When traveling north on Kingwood Pike (CR 81), turn right onto Aarons Creek Road (CR 70). Make a left turn onto Lower Aarons Creek Road (CR 64/1). Turn left onto Greenbag Road (CR 857) and continue until the Dorsey Ave/Kingwood Pike intersection. The same detour will exist for southbound traffic with directions reversed.

The **truck detour** is 10.6 miles and requires approximately 25 minutes. When traveling north on Kingwood Pike (CR 81), turn right onto Summers School Road (CR 72). Continue on Summers School Road (CR 72) when it becomes CR 70/1. Continue right on Summers School Road where it joins with CR 70 (Aarons Creek Road) and bear left onto 70/3 when CR 70 splits to the right. Turn left onto Earl Core Road (WV 7) and continue into Sabraton. Make a left turn onto Greenbag Road (CR 857) and continue until the Dorsey Ave/Kingwood Pike intersection. The same detour will exist for southbound traffic with directions reversed.

PROJECT IMPACTS AND SCHEDULE

Acquisition of new right-of-way for the project includes a total of 8.9 acres from 24 properties. Utilities will be relocated to eliminate conflicts with the proposed roadway upgrade and close coordination with the utility companies will be necessary to ensure service will not be disrupted.

PROJECT SCHEDULE

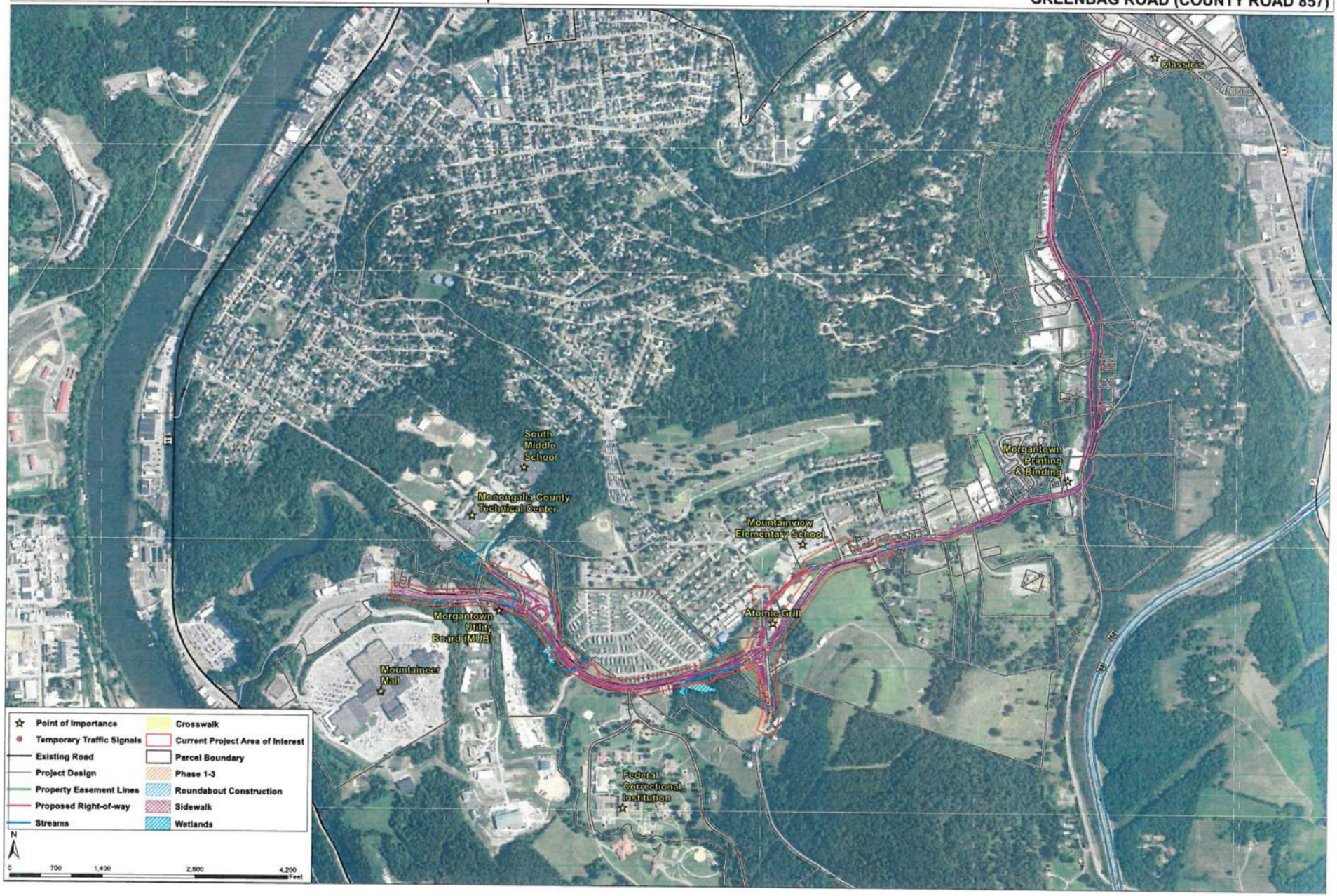
April 16, 2019	Public Meeting
May 16, 2019	Public comments due to the WVDOH
July 1, 2019	Environmental Clearance
Fall 2019	Project Letting
Spring 2020	Right-of-Way Acquired
Summer 2020	Construction Begins

Comments are due May 16, 2019 and should be sent to the following:
Mr. RJ Scites, P.E., Director Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25301
Or electronically at http://go.wv.gov/dotcomment

GREENBAG PUBLIC MEETING - 04/16/2019

MORGANTOWN/MONONGALIA PLANNING STUDY AREA

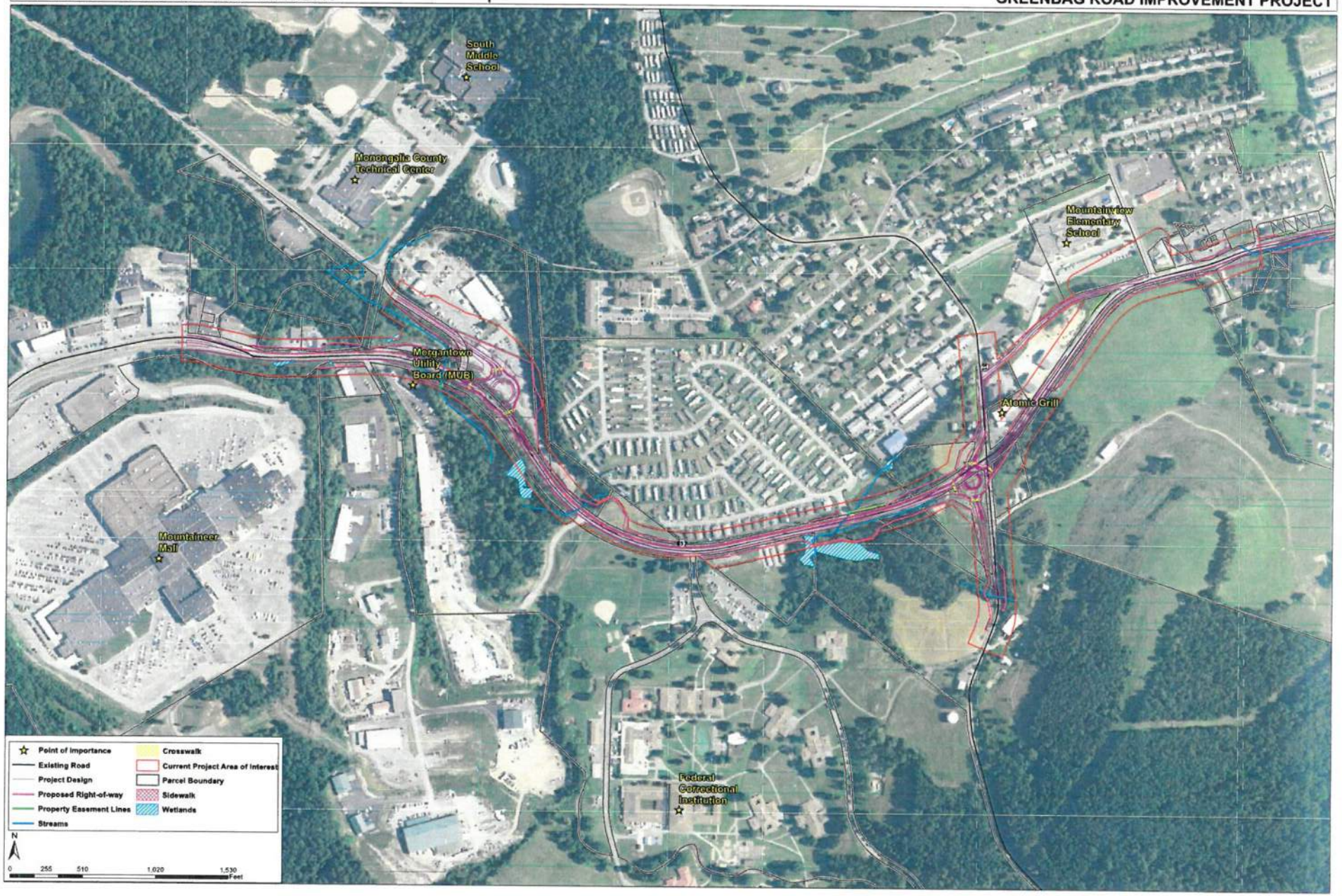
GREENBAG ROAD (COUNTY ROAD 857)



GREENBAG PUBLIC MEETING - 04/16/2019

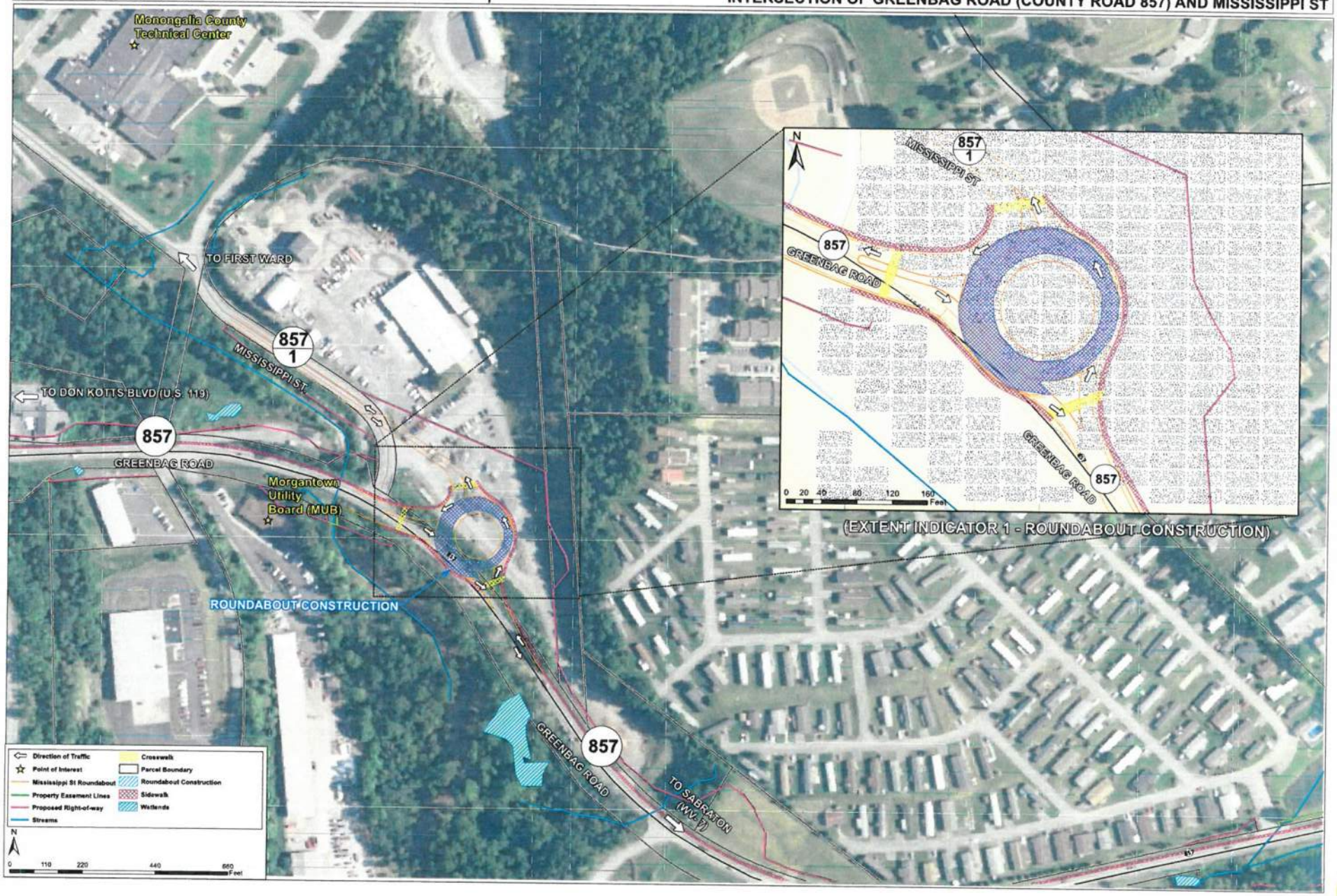
GREEN BAG ROAD PROJECT OVERVIEW

GREENBAG ROAD IMPROVEMENT PROJECT



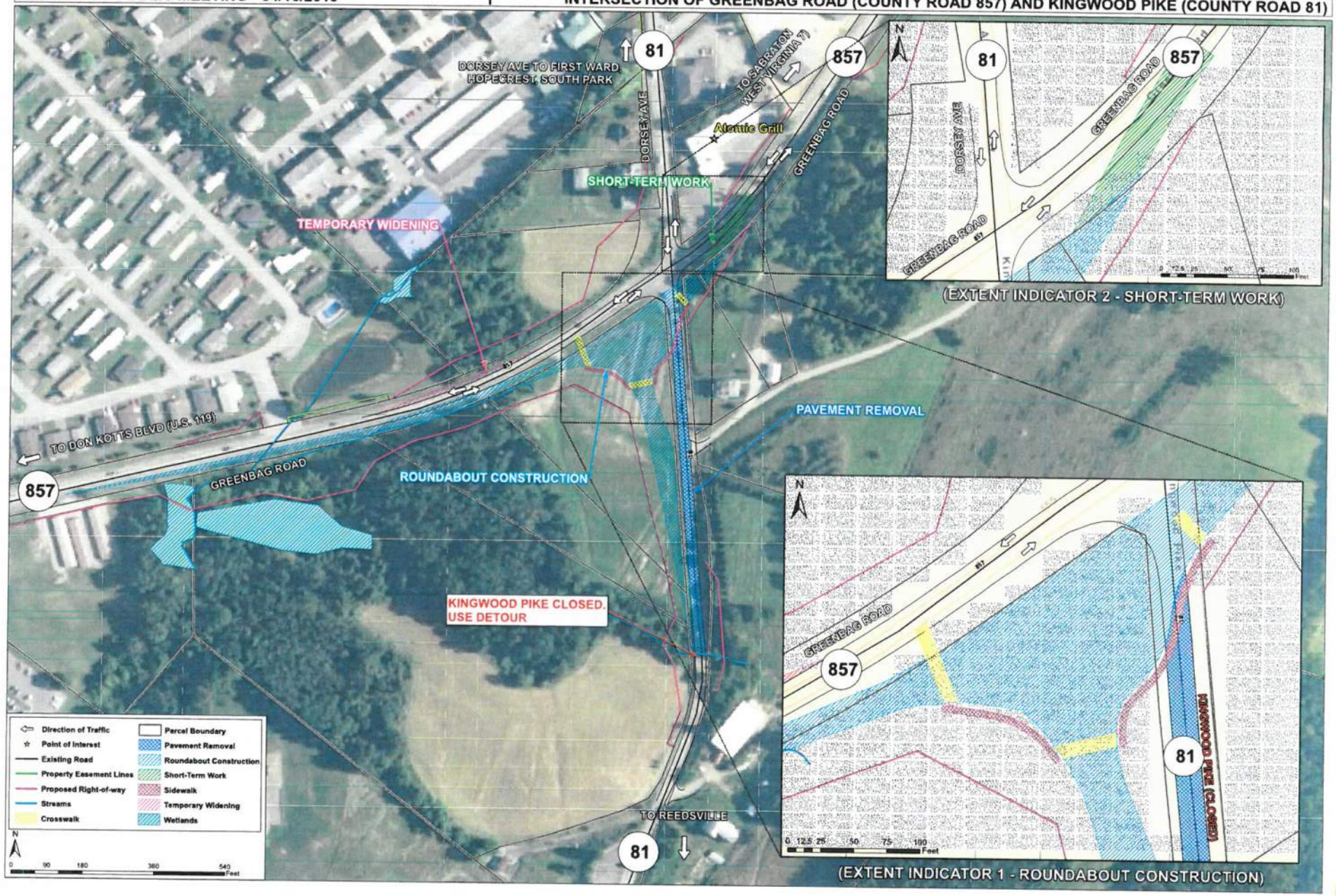
GREENBAG PUBLIC MEETING - 04/16/2019

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND MISSISSIPPI ST



GREENBAG PUBLIC MEETING - 04/16/2019

STAGES 1-3
INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)



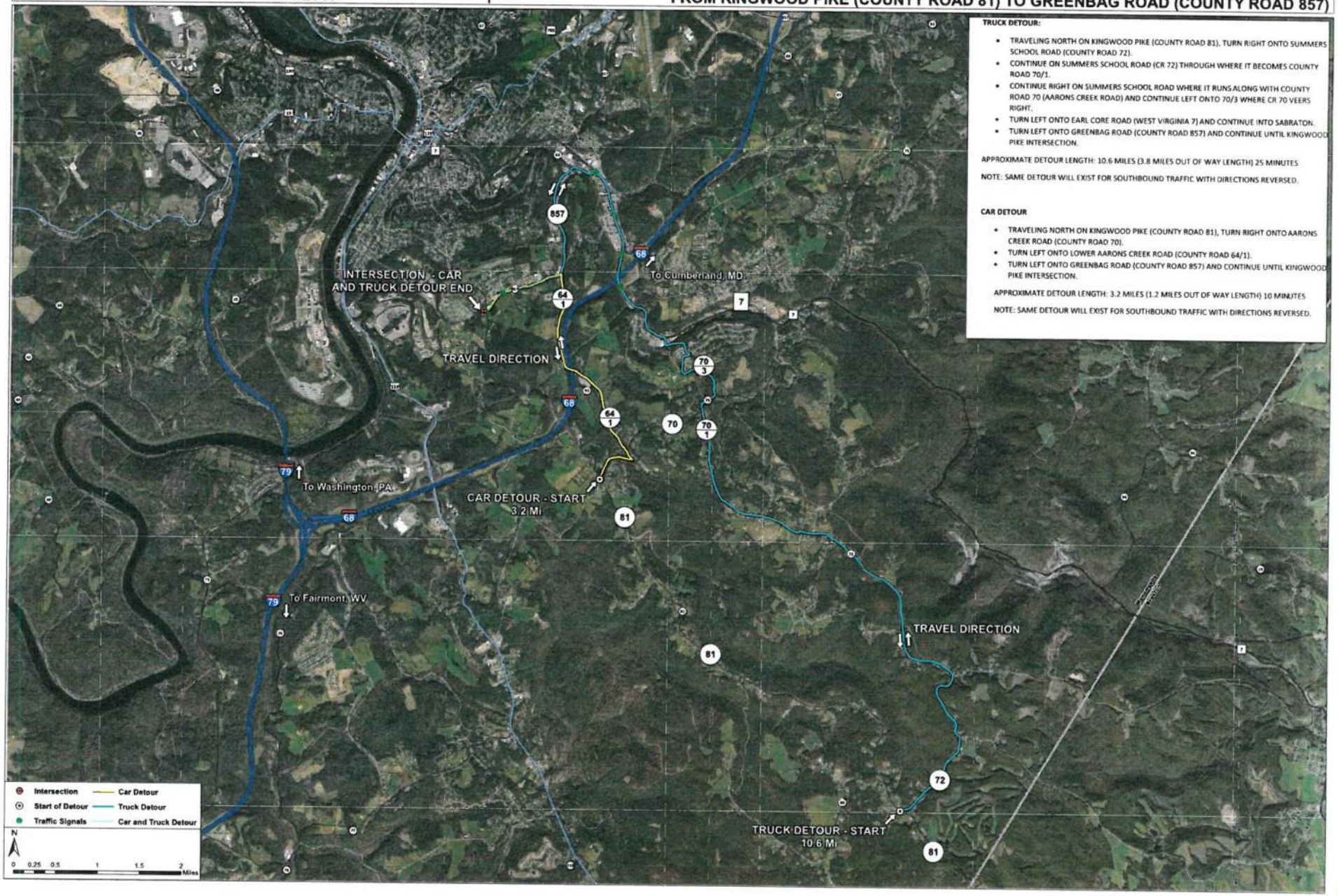
(EXTENT INDICATOR 2 - SHORT-TERM WORK)

(EXTENT INDICATOR 1 - ROUNDABOUT CONSTRUCTION)

GREENBAG PUBLIC MEETING - 04/16/2019

TRAFFIC DETOUR

FROM KINGWOOD PIKE (COUNTY ROAD 81) TO GREENBAG ROAD (COUNTY ROAD 857)



TRUCK DETOUR:

- TRAVELING NORTH ON KINGWOOD PIKE (COUNTY ROAD 81), TURN RIGHT ONTO SUMMERS SCHOOL ROAD (COUNTY ROAD 72).
- CONTINUE ON SUMMERS SCHOOL ROAD (CR 72) THROUGH WHERE IT BECOMES COUNTY ROAD 70/1.
- CONTINUE RIGHT ON SUMMERS SCHOOL ROAD WHERE IT RUNS ALONG WITH COUNTY ROAD 70 (AARONS CREEK ROAD) AND CONTINUE LEFT ONTO 70/3 WHERE CR 70 VEERS RIGHT.
- TURN LEFT ONTO EARL CORE ROAD (WEST VIRGINIA 7) AND CONTINUE INTO SABRATON.
- TURN LEFT ONTO GREENBAG ROAD (COUNTY ROAD 857) AND CONTINUE UNTIL KINGWOOD PIKE INTERSECTION.

APPROXIMATE DETOUR LENGTH: 10.6 MILES (3.8 MILES OUT OF WAY LENGTH) 25 MINUTES

NOTE: SAME DETOUR WILL EXIST FOR SOUTHBOUND TRAFFIC WITH DIRECTIONS REVERSED.

CAR DETOUR

- TRAVELING NORTH ON KINGWOOD PIKE (COUNTY ROAD 81), TURN RIGHT ONTO AARONS CREEK ROAD (COUNTY ROAD 70).
- TURN LEFT ONTO LOWER AARONS CREEK ROAD (COUNTY ROAD 64/1).
- TURN LEFT ONTO GREENBAG ROAD (COUNTY ROAD 857) AND CONTINUE UNTIL KINGWOOD PIKE INTERSECTION.

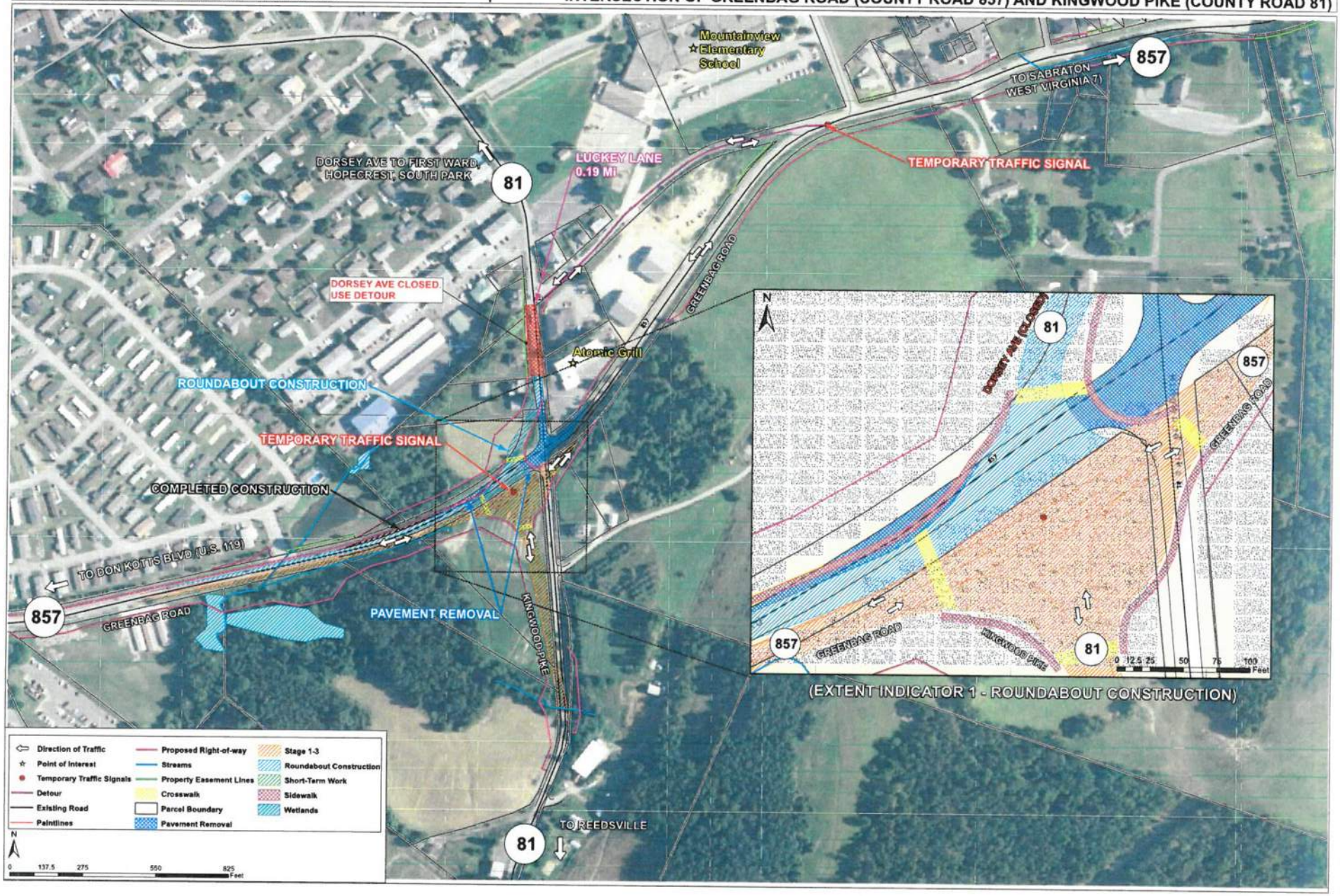
APPROXIMATE DETOUR LENGTH: 3.2 MILES (1.2 MILES OUT OF WAY LENGTH) 10 MINUTES

NOTE: SAME DETOUR WILL EXIST FOR SOUTHBOUND TRAFFIC WITH DIRECTIONS REVERSED.

GREENBAG PUBLIC MEETING - 04/16/2019

STAGE 4

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)



(EXTENT INDICATOR 1 - ROUNDABOUT CONSTRUCTION)

GREENBAG PUBLIC MEETING - 04/16/2019

INTERSECTION OF GREENBAG ROAD (COUNTY ROAD 857) AND KINGWOOD PIKE (COUNTY ROAD 81)



DATE:

Mr. RJ Scites, P.E.
Director, Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25301

DATE: **Tuesday, April 16, 2019**
LOCATION: **South Middle School**
SUBJECT: **Public Meeting**
PROJECT: **Greenbag Road Improvement Project**
State Project: U331-857-0.67
Monongalia County

COMMENTS DUE BY: **Thursday, May 16, 2019**

Please consider the following comments:

(Please print the following information)

NAME:

ADDRESS:

ORGANIZATION (IF ANY):

How did you hear about today's meeting?

Project Information and Comment Sheets can also be found at http://go.wv.gov/dotcomment under Engineering Projects, open and click Greenbag Road Improvement Project.

HM	State Project U206-60-12.57 00 Merritt's Creek to West Mall Road Widening Cabell County	There are no known occurrences of any RTE species or natural trout streams within the project area. A mussel survey will be required if any in-stream work is anticipated in the Mud River.
HM	State Project 38-28-16.13 Moore Run Plate Arch Pocahontas County	There are no known occurrences of any RTE species or natural trout streams at the project site; however, the project is within a habitat buffer for the Indiana bat. Additionally, Moore Run is a permanent tributary of Sitlington Creek, which is critical habitat for the endangered Candy darter. This project may require US Fish and Wildlife Service consultation.
RE	State Project S328-104-1.93 Federal Project STP-0104(011)D Brick Street Bridge Mercer County	There are no known occurrences of any RTE species or natural trout streams within the project area.
RC	State Project 42-5/9-0.90 Isner Creek No. 4 Culvert Replacement Randolph County	There are no known occurrences of any RTE species or natural trout streams at the project site; however, the project is within a habitat buffer for the Virginia big-eard bat.
NM	State Project 38-17-3.72 Hatchery Pipe Replacement Pocahontas County	There are no known occurrences of any RTE species or natural trout streams at the project site; however, the project is within a habitat buffer for the Indiana bat.

The Wildlife Resources Section knows of no surveys that have been conducted in these areas for rare species or rare species habitat. Consequently, this response is based on information currently available and should not be considered a comprehensive survey of the areas under review.

Thank you for your inquiry, and should you have any questions please feel free to contact me at the above number, extension 2048.

Sincerely,

MAR 0 7 2019

Barbara Sargent
Environmental Resources Specialist
Environmental Coordination
Operations Unit

WEST VIRGINIA
Division of Culture and History

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300
Randall Reid-Smith, Commissioner
Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562
EEO/AA Employer

January 2, 2020

Mr. Ben L. Hark
Environmental Section Head
Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, West Virginia 25305

RE: Greenbag Road Improvement Project
Federal Project No. STP-0857(019)D
State Project No. U331-857-0.067
FR: 20-203-MG-2

Dear Mr. Hark:

We received your submission dated December 17, 2019, which included documentation intended to facilitate our review of the undertaking. As required by Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties," we submit our comments.

According to the report, the West Virginia Department of Transportation, Division of Highways proposes to make improvements to Greenbag Road in Monongalia County, West Virginia. Improvements will include widening lanes and shoulders and constructing a dedicated center turn lane along a section of road beginning at the intersection of Greenbag Road (CR 857) and US 119 and continuing to where Greenbag Road crosses Aaron Creek. A curb and gutter will also be installed along the west side of the road. Because project plans have not been finalized, a study area was delineated that attempted to encompass all areas proposed for ground disturbance.

Architectural Resources:
We have reviewed the submitted documentation, including the report titled "Greenbag Road Improvement Project, Monongalia County, West Viginia," which Markosky Engineering Group prepared for the undertaking. We concur with Markosky's definition of the area of potential effects (APE) and note that within that APE the consultant identified 25 historic aboveground resources that are 45 years or older.

Of the 25 identified resources, Markosky recommended 23 be considered not eligible for inclusion in the National Register of Historic Places. Those properties are identified with the following SHPO site ID numbers:

MG-1332	MG-2646	MG-2651	MG-2656	MG-2661
MG-2640	MG-2647	MG-2652	MG-2657	MG-2665
MG-2642	MG-2648	MG-2653	MG-2658	MG-2666
MG-2643	MG-2649	MG-2654	MG-2659	
MG-2644	MG-2650	MG-2655	MG-2660	

Those properties are considered not eligible for inclusion in the National Register because they do not share any direct association with individuals or events that have influenced the broad patterns of our nation's history, either at a local, state, or national level. Nor do those properties embody the distinctive characteristics of any particular type, period, or method of construction. Several have lost a high degree of historic integrity of materials, workmanship, and design. Conversely, Markosky argued two resources are eligible for inclusion in the National Register.

The Campbell Farmhouse (MG-2641) was recommended eligible under Criterion C as a vernacular example of late Italianate architecture. Unfortunately, the surrounding agricultural property has lost much integrity. Accordingly, the property is not recommended eligible under Criteria A or B.

The Robert F. Kennedy Youth Center (aka FCI Morgantown Kennedy Center / MG-2645) was recommended eligible under Criterion A for reflecting developments in American penal history. The property was one of the earliest sites designed specifically to implement the "unit management" philosophy in the 1960s. As the survey team was unable to access the property, it was not evaluated under Criterion C, though it remains possible the property is eligible under that criterion.

We concur with Markosky's recommendations described above.

As the undertaking will remain largely shielded by existing tree buffers and will require limited visual intrusions, if any, we also concur with Markosky's assessment that the undertaking will impose *no adverse effect* on the two historic properties. No further consultation is necessary regarding architectural resources; however, we ask that you contact our office if your project should change.

Consulting Parties/Public Comments:
We note that your office sent letters about the proposed project to the Monongalia County Historic Landmarks Commission, the Morgantown Historic Landmarks Commission, Preservation Alliance of West Virginia, and the Monongalia Historical Society on January 30, 2019, with various follow-up communications occuring thereafter. We understand that any further correspondence or comments will be sent to our office.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the Section 106 process, please contact Mitchell K. Schaefer, Structural Historian, at (304) 558-0240.*

Sincerely,

Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/MKS

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
90 Vance Drive
Elkins, West Virginia 26241

Contact Name: Sydney Burke

Email Address or Fax Number: sydney.t.burke@wv.gov

FWS File # 2020-I-0282 **All future correspondence should clearly reference this FWS File #.**

Project: Greenbag Road Improvement Project, Monongalia County

Date of Letter Request: November 26, 2019

This is in response to your letter requesting threatened and endangered species information in regard to the proposed project listed above. These comments are provided pursuant to the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U. S. C. 1531 *et seq*.).

Two federally listed species could occur in the project area: the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septentrionalis*) (NLEB).

The Indiana bat and NLEB may use the project area for foraging and roosting between April 1 and November 15. Indiana bat summer foraging habitats are generally defined as riparian, bottomland, upland forest, and old fields or pastures with scattered trees. Roosting/maternity habitat consists primarily of live or dead hardwood tree species which have exfoliating bark that provides space for bats to roost between the bark and the bole of the tree. Tree cavities, crevices, splits, or hollow portions of tree boles and limbs also provide roost sites. In West Virginia, the U.S. Fish and Wildlife Service (Service) considers all forested habitat containing trees greater than or equal to 5 inches in diameter at breast height to be potentially suitable as summer roosting and foraging habitat for the Indiana bat.

Indiana bats feed on emerged aquatic and terrestrial flying insects. Moths, caddisflies, flies, mosquitoes, and midges are major prey items. Aquatic insects that have concentrated emergences or that form large mating aggregations above or near water appear to be preferred prey items. As a result, streams, wetlands, and associated riparian forests are often preferred foraging habitats for pregnant and lactating Indiana bats. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (e.g., old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. Increased erosion and sedimentation of streams reduces diversity and biomass of benthic invertebrates, i.e. insects. Some projects propose impacts to aquatic features such as streams or wetlands, which could result in a decrease in insects available to both bat species for foraging.

Similar to the Indiana bat, NLEB foraging habitat includes forested hillsides and ridges, and small ponds or streams. NLEB are typically associated with large tracts of mature, upland forests with more canopy cover than is preferred by Indiana bats. NLEB seem to be flexible in selecting roosts. They choose roost trees based on suitability to retain bark or provide cavities or crevices, and this species is known to use a wider variety of roost types than the Indiana bat. Males and non-reproductive females may also roost in cooler places like caves and mines. Although rare, this bat has also been found roosting in structures like barns and sheds.

Indiana bats and NLEB use caves or mine portals for winter hibernation between November 15 and March 31. These species also use the hibernacula and the areas around them for fall-swarming and spring-staging activity (August 15 to November 14 and April 1 to May 14, respectively). Some males have been known to stay close to the hibernacula during the summer and may use the hibernacula as summer roosts. There may be other landscape features being used as hibernacula by NLEB during the winter that have yet to be documented.

The Service has reviewed the number of acres of potentially suitable foraging and roosting habitat on the West Virginia landscape available to each Indiana bat, versus the total acreage of forest. On that basis, we have determined that small projects, more than 10 miles from a known priority 1 or 2 Indiana bat hibernaculum, more than 5 miles from a known priority 3 or 4 Indiana bat hibernaculum, or more than 2.5 miles from any known maternity roost, or more than 5 miles from summer detection sites where no roosts were identified, that affect less than 17 acres of forested habitat, and will not affect any potential hibernacula, will have a very small chance of resulting in direct or indirect effects to the Indiana bat, and therefore these effects are considered discountable. **Please note that the Service may review and update this assessment at any time as new information becomes available.**

The Service has determined that this project is not likely to adversely affect the Indiana bat because your project: 1) will affect less than 17 acres of potential Indiana bat foraging or roosting habitat; 2) is not within any of the Indiana bat hibernacula or summer use buffers described above; 3) will not affect any potential caves or mines that could be used as hibernacula for this species; and 4) effects to aquatic features used for foraging habitat will be insignificant.

The NLEB may occur within the range of the proposed project, and may be affected by the proposed construction and operation of this project. Any take of NLEB occurring in conjunction with these activities that complies with the conservation measures (as outlined in the 4(d) rule), as necessary, is exempted from section 9 prohibitions by the 4(d) rule and does not require site specific incidental take authorization. Note that the 4(d) rule does not exempt take that may occur as a result of adverse effects to hibernacula and that no conservation measures are required as part of the 4(d) rule unless the proposed project: 1) involves tree removal within 0.25 miles of known NLEB hibernacula; or 2) cuts or destroys known, occupied maternity roost trees or any other trees within a 150-foot radius around known, occupied maternity tree during the pup season (June 1 to July 31). This proposed project is not located within any of these radii around known hibernacula or roost trees and will not affect any known NLEB hibernacula, therefore any take of NLEB associated with this project is exempted under the 4(d) rule and no conservation measures are required.

Should project plans change or amendments be proposed that we have not considered in your proposed action, or if additional information on listed and proposed species becomes available, or if new species become listed or critical habitat is designated, this assessment may be reconsidered.

If you have any questions regarding these comments, please contact the biologist listed below at (304) 636-6586 or at the letterhead address.

Liz Stout Date: January 6, 2020
Biologist

Barbara Douglas Acting Date: 01/10/2020
Field Supervisor

Greenbag Road Improvement Project

Appendix E

Historic Structures Report

GREENBAG ROAD IMPROVEMENT PROJECT
MONONGALIA COUNTY, WEST VIRGINIA

State Project # U331-857-0.67 00
Federal Project # STP-0857(019)D

HISTORIC STRUCTURES SURVEY AND DETERMINATION OF ELIGIBILITY REPORT

Prepared for:

West Virginia Department of Transportation
Division of Highways

Prepared by:

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ABSTRACT

The Markosky Engineering Group, Inc. (Markosky) performed a historic structures survey for the Greenbag Road Improvement Project (Project) in Monongalia County, West Virginia for the West Virginia Department of Transportation's Division of Highways (WVDOH). The Project stretches approximately 1.65 miles beginning 0.40 miles east of the intersection of Greenbag Road (CR 857) and US 119 and ending where Greenbag Road (CR 857) crosses Aaron Creek.

The survey resulted in the identification of 25 structures that are 45+ years old within the Project's Area of Potential Effect (APE), one of which was previously identified by the West Virginia State Historic Preservation Office (WV SHPO): MG-1332 / Harner Chapel. Markosky completed West Virginia Historic Property Inventory (WV HPI) forms for all 25 properties. Of the 25 identified 45+ year old structures, two resources were recommended as eligible for listing in the National Register of Historic Places (NRHP). The MG-2641 / Campbell Farmhouse is a two-story brick dwelling from ca. 1886 that is significant under Criterion C for Architecture as a strong local example of an Italianate farmhouse, and the MG-2645 / Federal Correctional Institution (FCI) Morgantown Kennedy Center / Robert F. Kennedy Youth Center is a prison complex from 1968 that is significant under Criterion A for the embodiment in its design of an experimental new approach to youth rehabilitation and penal system practices.

The Project has been designed to avoid and/or minimize any potential impacts to the Campbell Farmhouse. The recommended NRHP boundary of the MG-2641 / Campbell Farmhouse encompasses 10.9 acres of surviving farmland, the Italianate dwelling, and several mid-20th century outbuildings that are situated on a flattened hilltop above a steep embankment at the edge of Greenbag Road. Project activities in this area are currently being refined, but, at most, they may include limited cuts into the sloping embankment and the possible acquisition of limited required right-of-way (ROW) on the south side of Greenbag Road in the vicinity of the resource. It is assumed that these activities will occur either outside the property's recommended NRHP boundary or at its edge where they will not have an effect on the Italianate farmhouse or its viewshed because they are screened by an existing buffer of trees and the elevational difference between the property within the boundary and the roadway below, which ranges between approximately ten to seventeen feet in height.

The Project has also been designed to avoid and/or minimize any potential impacts to the FCI Morgantown Kennedy Center. The MG-2645 / FCI Morgantown Kennedy Center prison complex is set back from Greenbag Road with the closest building located approximately 400 feet south of the road. All Project construction work will take place within WVDOH ROW without impacting the buildings or the design of the complex. At the Greenbag Road entrance to the prison complex, the only planned alteration will be the removal and replacement or upgrade of the triangular island that splits traffic at the entrance. The island is a standard road element/device, and this example is of typical construction and is not of significance to the original prison complex design. There are no planned impacts to the existing wood rail fencing and signage that are associated with the prison property. Project related construction is not anticipated to impact any structures associated with the prison, and it will not compromise any of the character defining features of the complex.

The remaining structures surveyed within the Project APE lack either the integrity and/or the significance to be considered eligible for listing in the NRHP, and, thus, Section 106 effects do not apply to those structures.

Markosky recommends that the Project work will not adversely affect any NRHP-eligible historic resources or structures and that no further historic structures investigations are needed. However, if any changes to the scope or design of the Project are introduced, additional historic structures investigations may be necessary.

Historic Structures Survey and Determination of Eligibility Report

Greenbag Road Improvement
Morgan District and City of Morgantown
Monongalia County, West Virginia

State Project Number U331-857-0.67 00

Federal Project Number STP-0857(019)D

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1.0 PROJECT DESCRIPTION AND DEFINITION OF APE

1.1 Project Description

The West Virginia Division of Highways (WVDOH) is proposing the Greenbag Road Improvement Project (Project) located southeast of the city of Morgantown in Monongalia County (Appendix A: Figures 1-3; Appendix B). The 1.65-mile long Project begins 0.40 miles east of the intersection of Greenbag Road (CR 857) and US 119 and ends where Greenbag Road crosses Aaron Creek (Insets 1-4). The overall roadway improvements include wider lanes and shoulders along with a dedicated center turn lane prior to the Mississippi Street (CR 857/1) intersection. A curb and gutter will be installed along the north side of Greenbag Road to help address drainage issues and to provide a sidewalk along the route from the western terminus of the Project to the Dorsey Avenue / Kingwood Pike (CR 81) intersection. In addition, the north side shoulder will be utilized as a shared bike lane for the corridor between the commercial district and the residential areas.



Inset 1. Project area overview from Dorsey Knob, facing northeast (Markosky 2019-02-05)



Inset 2. Project overview of Greenbag Road near Mississippi Street (right), facing northwest (Google Earth 2018)

The roadway will be improved to incorporate two 11-foot travel lanes with a 12-foot center turn lane with curb and gutter on each side up from the western terminus of the Project to Mississippi Street. Between Mississippi Street and Dorsey Avenue / Kingwood Pike, the roadway will be improved to two 12-foot travel lanes and a 4-foot paved shoulder on the south side. A 3-foot paved shoulder with a 2-foot curb and gutter will be added on the north side. The 5-foot

concrete sidewalk will be located on the north side of Greenbag Road and will connect with the sidewalk at Mountainview Elementary School. Both the Mississippi Street and Dorsey Avenue / Kingwood Pike intersections with Greenbag Road are proposed to be reconstructed as single-lane roundabouts to provide for continuous traffic flow along the route and to increase the safety of the traveling public as they enter each intersection. The roundabouts will also be developed to allow the safe movement of pedestrians along the sidewalk on the north side of Greenbag Road and will include lighting on each approach to the roundabout. Additional work on Luckey Lane will improve the width of the travel lanes within the existing right-of-way (ROW) and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. From the intersection of Greenbag Road and Jonathan Lane to the crossing of Aaron Creek at the eastern terminus of the Project, the design will include drainage improvements as necessary to address stormwater run-off.



Inset 3. Project overview of the intersection of Greenbag Road (left to right) with Dorsey Avenue / Kingwood Pike, facing north (Google Earth 2018)



Inset 4. Project overview of Greenbag Road at Luckey Lane (left), facing northeast (Google Earth 2018)

The work will require the acquisition of ROW, temporary construction easements (TCEs), and permanent drainage easements along the route. Traffic will be maintained during construction through the use of a maintenance of traffic (MOT) plan to minimize delays, maintain access to businesses, and maintain safety for travelers and for construction workers. The proposed MOT plan will include either the use of a detour on existing roads or temporary signals or flaggers. Construction will be completed in multiple stages to allow for continued

access through the intersection at Greenbag Road and Dorsey Avenue / Kingwood Pike.

1.2 Definition of the Area of Potential Effect (APE)

The APE for historic structures was developed using the limits of the Project with an additional buffer to account for potential effects to properties adjacent to Greenbag Road or to properties that share a significant viewshed with the Project (Appendix A: Figures 2 and 3). The Project is set within low, rolling hills comprised primarily of open fields with small areas of tree cover (Insets 5 and 6). Much of the area surrounding the Project was historically farm land that has seen areas of non-historic development and infill. Non-historic infill is prevalent on the north and south sides of Greenbag Road near the Mountaineer Mall; to the north of the Federal Correctional Institution (FCI) Morgantown Kennedy Center; on the north side of Greenbag Road to the east of Luckey Lane; and on the north side of Greenbag Road east of Jonathan Lane (Insets 7 and 8) (Appendix A: Figure 3).



Inset 5. Overview of Project APE near the Mountaineer Veterinary Clinic (left), facing east (Google Earth 2018)



Inset 6. Overview of Project APE showing MG-2647 / Anderson House with farmland (right) and intersection of Greenbag Road and Dorsey Avenue / Kingwood Pike (left), facing northeast (Google Earth 2018)

The historic structures APE extends along Greenbag Road and includes portions of Mississippi Street, Dorsey Avenue / Kingwood Pike, and Luckey Lane. The APE extends to include the Mountaineer Mall, which is located to the south of Greenbag Road at the western limit of the Project. Due to the position of the shopping mall atop a small bluff, the Project is located within its viewshed. Greenbag Road can be seen from the eastern section of the mall parking lot, and the mall can be seen from the intersection of Greenbag Road and Dorsey Avenue / Kingwood Pike.



Inset 7. Overview of Project APE showing non-historic Bluegrass Village mobile home park (left) and the grounds of MG-2645 / FCI Morgantown Kennedy Center (right), facing northeast (Google Earth 2018)



Inset 8. Overview of Project APE showing non-historic Mountainview Elementary School (left) and Dollar General (right) along Luckey Lane, facing northeast (Google Earth 2018)

2.0 PRE-FIELD RESEARCH AND SURVEY METHODOLOGY

In advance of fieldwork, Markosky compiled background research and developed an APE for historic structures investigations with guidance from WVDOH. Markosky performed desktop background research, including a review of the West Virginia State Historic Preservation Office's (WV SHPO) Interactive Map Viewer to determine the potential for previously recorded resources in the Project APE. One (1) previously recorded historic structure, MG-1332 / Harner Chapel, is located within the APE. The Harner Chapel, built ca. 1914, was surveyed in 1982 but was not evaluated for listing in the National Register of Historic Places (NRHP) by WV SHPO at that time.

The *West Virginia Statewide Historic Bridge Survey* was consulted in relation to the MG-2661 / Cobun Creek Box Culvert and the MG-2666 / Aaron Creek Box Culvert, which are both located within the APE (KCI et al. 2015). The small ca. 1965 Cobun Creek culvert was not included in the survey because it was built at or near the 1965 cut off for the study and because its span length is shorter than the requisite 20 feet for evaluation (KCI et al. 2015). The ca. 1966 Aaron Creek Box Culvert was also excluded from the survey because of its construction date.

Additional online resources were consulted to assemble historic-era maps and atlases of the greater Project area and Monongalia County and to inform the historic context. Survey and reporting were completed following the guidance in WV SHPO's *National Register and Architecture/History Survey Manual* (WV SHPO 2016). The WVDOH Historical Pre-Screening Checklist is included in Appendix D.

Markosky architectural historian Elizabeth Williams performed a field survey of the Project's historic structures APE on December 4, 2018 and February 5, 2019 with additional field survey performed by architectural historian Laura Ricketts on October 25, 2019. Using a high definition digital camera, they photographed historic structures within the APE from the public ROW. At the direction of WVDOH, Markosky surveyed any resources within the APE that were 45 years old or older. While in the field, detailed notes were taken concerning the style, type, approximate construction year, primary building material, and additional notes on the property including outbuildings and any landscapes features. Following confirmation of the final Project APE, Markosky requested 24 new inventory numbers from the WV SHPO and incorporated them into the report and the West Virginia Historic Property Inventory (WV HPI) forms.

On-site archival background research was conducted to collect information regarding the history of Monongalia County and to provide a context for the evaluation of the historic structures identified during the field survey. The repositories visited include the Office of the Monongalia County Clerk at the Monongalia County Courthouse and the West Virginia and Regional History Center at West Virginia University's library in Morgantown, West Virginia.

3.0 PUBLIC INVOLVEMENT

WVDOH initiated consultation with local organizations concerning the Project beginning on January 30, 2019 (Appendix E). Initial correspondence was sent to the Monongalia County Historic Landmarks Commission (MCHLC); the Morgantown Historic Landmarks Commission (MHLC); the Preservation Alliance of West Virginia (PAWV); and the Monongalia Historical Society (MHS). Follow-up emails were sent to the MCHLC, MHLC, and MHS on February 11, 2019. MCHLC responded via email on February 11, 2019 and indicated that the WVDOH correspondence had been shared with all MCHLC members and would be discussed at the next meeting on February 21, 2019. On February 25, 2019 MCHLC sent an email indicating that there were no comments related to the Project at the February 21 meeting. MHLC responded via email on February 13, 2019 and indicated that it had no comments as the Project is located outside of the city of Morgantown and therefore outside of the jurisdiction of the organization. As of the submission date for this report, no additional responses have been received.

Due to the expansion of the Project area in the latter half of 2019, WVDOH emailed updated project information to MCHLC and MHS on November 4, 2019. MCHLC responded that there were no historic property concerns. MHS has not responded to WVDOH's November 4, 2019 email at the time of the submission of this report.

In advance of fieldwork, Markosky attempted to coordinate access to MG-2645 / FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center, a prison complex from 1968 located within the APE, in order to field survey and photograph its structures. Though coordination has been ongoing, Markosky has not been granted access to the facility as of the submission date of this report.

4.0 HISTORIC CONTEXT

The Project is located along Greenbag Road approximately 1.65 miles southeast of the city of Morgantown in Monongalia County (Google Earth 2018). This area of Monongalia County historically comprised rural farm land owned by a handful of families who settled in the area in the early to mid-19th century. Greenbag Road was constructed in the early 1960s by the Green Bag Cement Company as a bypass road south of Morgantown. Today, the area is characterized by a few surviving late 19th and early 20th century farms and residences; mid-century residences and later non-historic residential development; the FCI Morgantown Kennedy Center complex, a minimum security prison built in 1968 as a juvenile detention center; and large scale commercial and industrial development including the Mountaineer Mall which was constructed in 1974.

The first Euro-American settlers arrived in the vicinity of the Project and modern day Morgantown in 1758 when Tobias Decker, along with 50 other pioneers, built a rudimentary settlement near Morgantown at the confluence of Deckers Creek and the Monongahela River (approximately 1.65 miles northwest of the Project). This area of what was historically northwest Virginia and southwestern Pennsylvania was still highly contested between pioneer settlers and Native Americans. When Decker's settlement was raided in 1766, its residents were dispersed to other nearby settlements. That same year, Zackquill Morgan and his brother David registered a land claim and attempted to establish a settlement in the vicinity of what would become Morgantown. Virginia and Pennsylvania also had a longstanding dispute concerning the exact location of Pennsylvania's southern and western borders (Carvell 2018).

During the late 18th century, small stockades and forts were established throughout southwestern Pennsylvania and northwestern Virginia as reinforcement for pioneer settlers. Among these strongholds was Coburn's Fort located approximately one mile southwest of the Project and to the east of the Monongahela River. The fort was established by Jonathan Coburn, who arrived in the area around 1770 (Muttillo and Blosser 2018). It is said that the meeting for the organization of Monongalia County was held at Coburn's house in 1776 (Core 1976:379-380). Monongalia County was formed from what was historically known as the Western Augusta district on the western frontier of Virginia. The district had been formed in 1775 and the following year was divided into three counties: Monongalia, Yohogania, and Ohio. Monongalia County, at that time, included land that now constitutes counties in modern day northern West Virginia and southwest Pennsylvania (Carvell 2018). Monongalia County would later become known as the "mother county" of northern West Virginia as so many counties were formed from it (Monongalia County Commission 2018).

Around the time of the formation of Monongalia County, the path of modern day Kingwood Pike was cut through the local wilderness. The road, later referred to as the Morgantown, Kingwood, and Evansville Pike, intersects modern day Greenbag Road within the APE and is noted as the oldest road in Monongalia County in Wiley's *History of Monongalia County, West Virginia* (Wiley 1883:653). The road was established as a pack horse road between 1772 and 1776. Settlers used the road to transport salt and iron from Winchester, Virginia into Monongalia County. The road later provided access to land further west in Ohio (Wiley 1883:536). No discernable

structural remains of the turnpike appear to exist in the Project APE. Around 1783, Zackquill Morgan received a land grant of 400 acres and hired a land surveyor to divide 50 acres along the Monongahela River into lots and lay out streets. Morgan's Town (or Morgantown, as it later became known) was established by an act of legislation in 1785. A stipulation of the purchase of a lot in Morgan's Town was that a structure was to be constructed within five years. This encouraged development and deterred absentee landowners, a problem which often plagued early pioneer settlements (Monongalia County Commission 2018; Carvell 2018; WVGenWeb 2010).

In 1793, the *Pittsburgh Post-Gazette* began newspaper delivery to Morgantown which prompted the construction of an early north-south route between the communities. This, in addition to the discovery of iron ore in the nearby ridges, helped to jumpstart growth in Morgan's Town (WVGenWeb 2010). A 1795 map of Virginia illustrates Morgan's Town on the east bank of the Monongahela River, as well as the general vicinity of the Project APE (Appendix A: Figure 4 [Lewis 1795]). Two established roads are illustrated leading to Morgantown from Maryland; the road traveling southeast of Morgan's Town is likely modern day Kingwood Pike. No other settlements are indicated in the area, and the closest identified towns were Pittsburgh, Pennsylvania to the north and Fort Cumberland, Maryland to the east (Lewis 1795).

In 1803, Jonathan Coburn sold his property southwest of the APE to George Dorsey who moved to the area from Elk Ridge, Maryland, a suburb of Baltimore. The natural rock formation on the property became known as Dorsey's Knob and functioned as a tourist attraction beginning in the late 19th century. An 1827 map of Virginia shows the early development around the APE and Morgan's Town, labeled at this time as Morgantown (Appendix A: Figure 5 [Boye 1827]). A larger network of early roads is illustrated around Morgantown, while grist mills and iron furnaces were situated along the rivers and smaller streams. Two grist mills and two iron furnaces are illustrated along Deckers Creek (Boye 1827).

Agriculture and iron industries sustained the economy of Monongalia County into the middle of the 19th century. Morgantown was formally incorporated in 1858. Monongalia County supported the Union during the Civil War, and Morgantown was briefly raided in 1863, the same year West Virginia acquired its statehood (Carvell 2018). After West Virginia was formed, the Morrill Act of 1863 awarded Morgantown a land grant for a college. Morgantown was considered a favorable location due to the existing academic buildings of the Monongalia Academy (established in 1814) and the Morgantown Female Collegiate Institute (established in 1831). The West Virginia Agricultural College was organized in 1867 and the following year the name of the college was changed to West Virginia University, as it is known today (Carvell 2018).

White's *Topographical County and District Atlas of West Virginia* of 1873 shows a general overview of the Project APE and nearby Morgantown (Appendix A: Figure 6 [White 1873]). The road network around Morgantown continued to develop and numerous small communities with established post offices surrounded the city. Kingwood Pike is illustrated traveling southeast from Morgantown along the border of the Morgan and Clinton Districts (White 1873).

In 1886, the Fairmont, Morgantown, and Pittsburgh Branch of the Baltimore and Ohio (B&O) Railroad was constructed to Morgantown. The line was eventually constructed to Connellsville, Pennsylvania, providing service from Morgantown to Pittsburgh and Cumberland (Carvell 2018; Frey 2018). An 1886 map of Monongalia County, including the Morgan District, illustrates the Project APE and Morgantown (Appendix A: Figure 7 [Lathrop 1886]). The orderly grid of Morgantown is illustrated on the east bank of the Monongahela River. The Fairmont, Morgantown, and Pittsburgh Branch of the B&O Railroad is illustrated traveling along the east bank of the river to its terminus in the southwestern area of the city. The alignment of Kingwood Pike is illustrated traveling through the APE. The Dorsey School House No. 1, the original school building on the site which has since been replaced by a ca. 1920 building, was at this time located at the intersection of Kingwood Pike (labeled on the map as the Kingwood, Morgantown, and West Union Turnpike) and modern day Luckey Lane. No roadway following the modern path of Greenbag Road existed at this time. Members of the Dorsey family were still living in the vicinity of Dorsey's Knob southwest of the APE. Other surnames in the immediate vicinity of the APE include Anderson, Morris, Patton, Wood, and Campbell (Lathrop 1886).

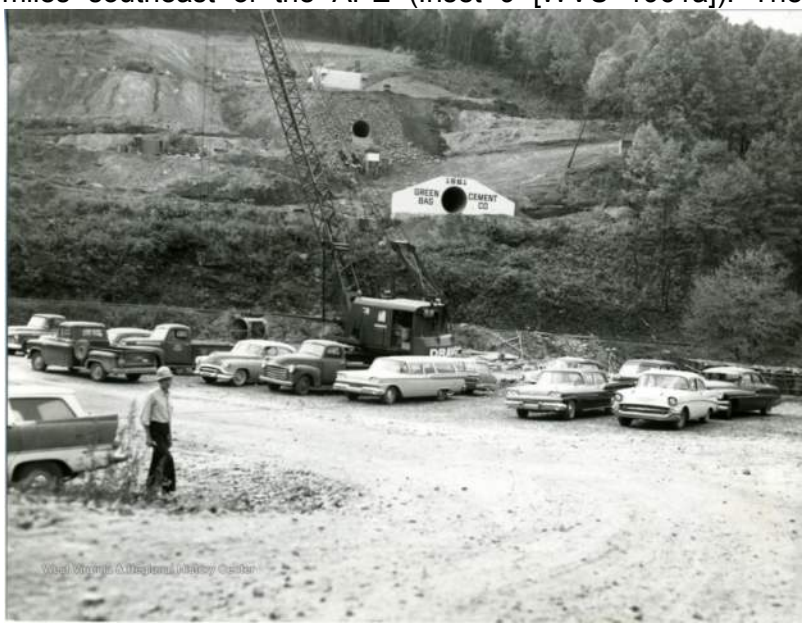
Oil was discovered in central Monongalia County (northwest of the APE) in 1889 which prompted an oil boom throughout the county. The Eureka Pipeline Company, a subsidiary of Standard Oil of Ohio which was founded by John D. Rockefeller, was organized in 1890 to transport oil extracted in West Virginia via pipelines. The company acquired a large amount of land along Coburn Creek (referred to presently as Cobun Creek) northwest of the APE and south of Morgantown for a pumping station and storage tanks to hold oil waiting for transport. Eight tanks were constructed by the end of 1890 and seven more were proposed for the following year. Each tank held approximately 25,000 to 30,000 barrels of oil (Core 1982:143-144). Two photographs from 1895 show a collection of oil tanks south of Morgantown dotting the rolling landscape of rural Monongalia County (Appendix A: Figures 8 and 9 [WVU 1895a and 1895b]). The close of the 19th century also saw the first coal mines opened in Monongalia County. With an established railroad network and the discovery of the lucrative Pittsburgh Coal Seam in central and eastern Monongalia County, mining companies and workers were drawn to the area (Carvell 2018).

The storage tanks of the Eureka Pipeline Company are illustrated as dots northwest of the APE on a 1902 topographic map (Appendix A: Figure 10 [USGS 1902]). The oil tanks were located to the southwest of modern day Dorsey Avenue and mostly north of Cobun Creek. In the vicinity of the APE, a few dwellings were scattered along the existing road network although the area was rural and largely undeveloped. Dorsey Knob is illustrated south of the APE; it was by this time a local tourist attraction and popular picnic spot (USGS 1902). In 1909, the organization of a chapel was proposed after several successful Methodist revival meetings were held at the Dorsey School House. As a result the Harner Chapel was constructed opposite the school on the north side of Luckey Lane, east of Dorsey Avenue. The chapel was formally dedicated in 1914. The land for the chapel was donated by Fairchild Harner, who owned land in the vicinity of the APE, as well as elsewhere in Monongalia County (The Monongalia Historical Society 1954).

A 1925 topographic map shows additional oil storage tanks constructed within and surrounding the western limits of the APE (Appendix A: Figure 11 [USGS 1925]). Morgantown continued to expand to the southwest nearer to the APE, and Kingwood Pike was signed as a highway by this time. A church (MG-1332 / Harner Chapel) and school (MG-2651 / Dorsey School) are labeled at the intersection of Dorsey Avenue and Luckey Lane, although they are not named as were other churches and schools in the vicinity. The school illustrated on the map is likely the existing ca. 1920 Dorsey School standing at the intersection today. An early road alignment in the vicinity of what would become Greenbag Road is illustrated west of the APE traveling through the oil tank field (USGS 1925).

As Morgantown advanced into the middle of the 20th century, its economy was sustained by the established coal industry which saw a boom during both World Wars. Agriculture supplemented the economy of the county. West Virginia University doubled its enrollment after World War II, and the campus expanded rapidly in response (Carvell 2018). While development within Morgantown was steady, little change had taken place in the vicinity of the APE by the middle of the 20th century. A 1957 topographic map shows that some additional residential development had occurred at the intersection of Kingwood Pike and Luckey Lane (Appendix A: Figure 12 [USGS 1957]). Both Harner Chapel and the Dorsey School are labeled at the intersection. A cemetery is labeled outside of the APE to the west of the church and school. The vast field of oil tanks illustrated in the previous topographic maps was at this time reduced to just three as the oil industry waned within the county by the late 1930s (Allen and Matchen 2017). No extant remnants of the oil tanks or associated infrastructure were noted within the APE.

In the early 1960s, the Green Bag Cement Company of Pittsburgh established a limestone plant on Deckers Creek near the unincorporated community of Greer, located approximately 5.75 miles southeast of the APE (Inset 9 [WVU 1961a]). The company bought land south of Morgantown and west of the APE along the Monongahela River and constructed a loading dock to ship their products to Pittsburgh on barges (Inset 10 [Rote 2015:52; WVU 1961b]). The company also paid for the construction of a four and a half mile bypass road leading from their docks south of Morgantown to Sabraton located roughly 1.46 miles to the east of Morgantown and 1.80 miles northeast of the APE. Greenbag Road, which was named for the company, was constructed to provide a throughway from Route 119 south of Morgantown to Route 7



Inset 9. Greenbag Cement Company plant near Greer, Monongalia County, ca. 1961 (WVU 1961a).



Inset 10. Greenbag Cement Company loading dock along the Monongahela River west of Project, ca. 1961 (WVU 1961b).

near Sabraton (Rote 2015:52). The construction of Greenbag Road encouraged the residential, commercial, and industrial development of the rural area surrounding the APE.

The relatively undeveloped and rural setting along Greenbag Road also made it an ideal location for the creation of an experimental juvenile detention facility that was constructed just south of the APE in 1968. The MG-2645 / Robert F. Kennedy Youth Center (now known as the FCI Morgantown Kennedy Center) was designed as a prototype for the experimental penal system model known as "unit management", a management model in which juvenile offenders were treated more as students and put into groups of 5-200 managed by multidisciplinary teams. (Kasey 2015:51; Balchen 1971:15). The sprawling campus-style complex covers approximately 103 acres and was built on former farm land likely owned at one time by heirs of George Dorsey.

Development around the APE progressed during the 1960s and into the 1970s. MG-2655 / Mountain View Manor, a multi-unit housing complex, was constructed around 1970 north of the APE and west of Dorsey Avenue. A small housing development was constructed behind Mountain View Manor north of the APE on the west side of Dorsey Avenue. The postwar development is composed predominantly of Ranch and Split Level homes (see MG-2656 and MG-2657) typical for the time period and was laid out along three straight dead end roads extending southwest from Dorsey Avenue (Google Earth 2018). In the western limit of the APE, the construction of the MG-2643 / Mountaineer Mall in 1974 brought the first large-scale, air conditioned multi-store shopping center to northern West Virginia (Latrobe Bulletin 1975). The construction of the mall prompted more commercial construction in its vicinity on the north side of Greenbag Road. It was also during this time that the MG-2644 / Morgantown City Garage was constructed by the Mellon-Stuart Company of Pittsburgh, Pennsylvania. The company was well known in the Pittsburgh region for its railroad related construction and construction of grand office buildings in Pittsburgh. During the 1970s the company began to pursue more construction projects outside of Pittsburgh during the decline of the steel industry. The Morgantown City Garage is a very modest and utilitarian example of the firm's work (Funding Universe 2019).

A 1976 aerial photograph shows the APE and vicinity (Appendix A: Figure 13 [USGS 1976]). The area that was once made up of rural farm land now appears as a developed suburb of Morgantown. The complex of the detention facility, which by this time had been converted to an

adult correctional institution, is visible on the south side of Greenbag Road. The housing development north of the APE on the west side of Dorsey Avenue is also visible. Two farms (MG-2646 and MG-2647) are shown on Kingwood Pike south of its intersection with Greenbag Road, and both the Dorsey School and Harner Chapel are visible at the intersection. The Mountaineer Mall dominates the western limit of the APE (USGS 1976).

Commercial and residential development north and south of the APE has continued into the 21st century, as evidenced in a modern aerial photograph (Appendix A: Figures 2 and 3 [Google Earth 2018]). Non-historic commercial and industrial development surrounds the Mountaineer Mall, while a large non-historic mobile home park is located on the north side of Greenbag Road west of its intersection with Kingwood Pike and Dorsey Avenue. Commercial and residential development has continued along Greenbag Road, particularly east of the intersection of Dorsey Avenue / Kingwood Pike and east of Jonathan Lane. Today, the heavily trafficked road is one of the main arteries in southeastern Morgantown.

5.0 FIELD RECONNAISSANCE AND EVALUATIONS

Markosky identified 25 structures that are 45+ years old within the Project APE, one of which was the previously recorded MG-1332 / Harner Chapel. Two of the structures surveyed within the APE were recommended as NRHP eligible: the MG-2641 / Campbell Farmhouse and the MG-2645 / FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center. A summary of the 45+ year old structures in the APE is provided below (Table 1) and a detailed description of each structure including setting, physical description, and discussion of significance follows. All of the identified 45+ year old structures in the APE are mapped on Figure 2 in Appendix A and photographs of each are included in Appendix C. The locations of the photographs are mapped on Figure 14 in Appendix A. WV HPI forms for all 25 structures are included in Appendix F.

Table 1. Summary of Identified Historic Structures in APE

WV SHPO Inventory ID	Address	Common / Historic Name	Year Built	Style or Type	Recommended NRHP Eligibility
MG-1332	100 Luckey Lane	Harner Chapel	Ca. 1914	Gothic – Carpenter	Not Eligible
MG-2640	796 Greenbag Road	House at 796 Greenbag Road	Ca. 1940	Craftsman Style Bungalow	Not Eligible
MG-2641	834 Greenbag Road	Campbell Farmhouse	Ca. 1886	Italianate	Eligible, Criterion C
MG-2642	851 Greenbag Road	House at 851 Greenbag Road	Ca. 1970	Modern; Ranch	Not Eligible
MG-2643	5000 Greenbag Road	Mountaineer Mall	1974	Late 20th Century Commercial	Not Eligible
MG-2644	2020 Mississippi Street	Morgantown City Garage	1975-1976	Modern Garage/Storage	Not Eligible
MG-2645	446 Greenbag Road	FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center	1968	Modern; Ranch	Eligible, Criterion A
MG-2646	87 Kingwood Pike	Patton Farm	Ca. 1880	National Folk	Not Eligible
MG-2647	27 Kingwood Pike	Anderson House	Ca. 1922	American Four-Square	Not Eligible
MG-2648	1440 Dorsey Avenue	House at 1440 Dorsey Avenue	Ca. 1915	Bungalow	Not Eligible

WV SHPO Inventory ID	Address	Common / Historic Name	Year Built	Style or Type	Recommended NRHP Eligibility
MG-2649	1436 Dorsey Avenue	Smith House	Ca. 1915	American Four-Square	Not Eligible
MG-2650	1451 Dorsey Avenue	Atomic Grill	1974	Late 20th Century Commercial	Not Eligible
MG-2651	1433 Dorsey Avenue	Monongalia County Head Start / Dorsey School	Ca. 1920	Classical Revival	Not Eligible
MG-2652	1432 Dorsey Avenue	House at 1432 Dorsey Avenue	Ca. 1915	Bungalow	Not Eligible
MG-2653	102 Luckey Lane	House at 102 Luckey Lane	Ca. 1940	Minimal Traditional	Not Eligible
MG-2654	104 Luckey Lane	House at 104 Luckey Lane	Ca. 1940	Minimal Traditional	Not Eligible
MG-2655	1201 – 7304 Mountain View Manor	Mountain View Manor	Ca. 1970	Modern	Not Eligible
MG-2656	500 Parkway Drive	House at 500 Parkway Drive	Ca. 1970	Modern Ranch	Not Eligible
MG-2657	502 Parkway Drive	House at 500 Parkway Drive	Ca. 1970	Modern Split-Level	Not Eligible
MG-2658	693 Greenbag Road	House at 693 Greenbag Road	Ca. 1955	Modern Ranch	Not Eligible
MG-2659	703 Greenbag Road	Clinton Water Association	Ca. 1900	American Four-Square	Not Eligible
MG-2660	710 Greenbag Road	House at 710 Greenbag Road	Ca. 1930	American Four-Square	Not Eligible
MG-2661	Mississippi Street at Greenbag Road	Cobun Creek Culvert	Ca. 1965	20th Century Box Culvert	Not Eligible
MG-2665	918 Greenbag Road	The Sube Shop	Ca. 1970	Commercial	Not Eligible
MG-2666	Greenbag Road at Aaron Creek	Aaron Creek Box Culvert	Ca. 1966	Continuous Concrete Culvert	Not Eligible

5.1 MG-1332 / Harner Chapel
100 Luckey Lane



MG-1332 / Harner Chapel is located on the northeast quadrant of the intersection of Luckey Lane and Dorsey Avenue. The chapel is located approximately 1.55 miles southeast of the city of Morgantown and is set within an area of mixed single family and multi-unit residences and commercial development. Harner Chapel was previously surveyed in 1982, but it was not evaluated for NRHP eligibility (Toth 1982). Harner Chapel is a ca. 1914 Carpenter Gothic frame building covered in vinyl siding and capped by a hipped roof covered in asphalt shingle (Appendix C: Photograph 1). The chapel rests on a rock faced concrete block foundation, and its façade features a narthex with a full height bell tower capped by a simple ca. 1990 spire with fixed Gothic arch windows. The fenestration of the chapel consists of Gothic arch windows and paired vinyl sash, one-over-one windows in the ca. 1955 two-story rear addition. A ca. 1990 partial width, shed roof addition has been appended to the northeast elevation. The reconfiguration of the bell tower with a non-historic spire, the large rear addition, and the use of replacement roofing and cladding materials has compromised the historic integrity of the chapel.

Harner Chapel was organized in 1909. The impetus for its organization and eventual construction was the success of Methodist revival meetings that were held at the Dorsey Schoolhouse (which was replaced by the Dorsey School ca. 1920). The land for the chapel was donated by local resident Fairchild Harner and the chapel was dedicated in 1914 (The Monongalia Historical Society 1954:82). In 1939 the chapel became known as the United Methodist Church, and the rear addition was added ca. 1955 (Toth 1982:4). The chapel continues to hold services.

No information was recovered linking the Harner Chapel to events significant on the local, state, or national level. The chapel stands as a common example of an early 20th century rural religious structure which can be found throughout Monongalia County. Therefore, Harner Chapel is not eligible for NRHP listing under Criterion A. The land on which the chapel was built was donated by Fairchild Harner, a local resident. No information was recovered to suggest that Harner was significant on the local, state, or national level. Therefore, Harner Chapel is not eligible under Criterion B.

Harner Chapel stands as a common, unexceptional, and altered example of a rural religious structure. Harner Chapel does not possess high artistic value, represent the work of a master, or embody the distinctive characteristics of a type, period, or method of construction. Therefore, it is not eligible for listing under Criterion C. The church has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or

prehistory. The church is not eligible for NRHP listing under Criteria Consideration A: Religious Properties as it is not significant on architectural, artistic, or historic grounds.

5.2 MG-2640 / House at 796 Greenbag Road

796 Greenbag Road



MG-2640 / House at 796 Greenbag Road sits at the top of a steep drive in a heavily wooded lot on former farmland on the south side of Greenbag Road. It is surrounded to the west, south, southeast, and northeast by non-historic churches that have been built to serve the increasingly suburban area.

The altered house appears to be a late (ca. 1940) example of a Craftsman Style bungalow with front and rear shed roof dormers protruding from the steep side gable roof (Appendix C: Photograph 2). It retains knee braces under the gables, but otherwise features replacement siding, roofing, and windows. The formerly open integral front porch has been partially enclosed. An outbuilding--presumed to be a detached garage--was obscured by tree cover.

The House at 796 Greenbag Road represents an altered and unremarkable example of a common house type from the early 20th century. It does not appear to be associated with any significant events; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

5.3 MG-2641 / Campbell Farmhouse

834 Greenbag Road



MG-2641 / Campbell Farmhouse located at 834 Greenbag Road is a two-story Italianate farmhouse, which was constructed ca. 1886. It sits on a flattened hilltop above Greenbag Road on a property comprised of gently rolling farmland with a meandering creek, several tree lines, and a number of outbuildings dating to the mid-20th century. The 19th century farm formerly occupied at least 126 acres in the vicinity of Aaron Creek, but its tax parcel currently measures closer to 23.9 acres since much of the former farmland has been subdivided and sold off to support

nearby suburban development. It is surrounded by mid- and late 20th century residences and housing developments, commercial buildings, and several non-historic churches.

A long gravel driveway leads up a steep embankment from Greenbag Road at the north edge of the farm to the two-story brick Campbell Farmhouse at the heart of the farmstead (Appendix C: Photograph 3). The Italianate farmhouse, which was built ca. 1886, has a T-shaped plan formed by the five bay front section of the farmhouse and a perpendicular two-story rear ell. The farmhouse has a three gable roof with prominent gable returns and replacement asphalt shingle roofing. Two interior end brick chimneys flank the main section of the house and a third brick chimney is located at the center of the rear ell. The brick walls are laid in an American common bond pattern with seventh row headers and feature tall segmental arch window openings on all elevations, although at least one window on the south (side) elevation has been bricked in and one window on the east (rear) elevation has been resized. The current windows are one-over-one metal sash replacements. The farmhouse has a full width front porch with a shallow half hipped roof, turned posts, and scroll sawn brackets. Similar scrolled brackets line the cornice under the eaves. A secondary porch is located on the north elevation of the rear ell. The farmhouse has the characteristic massing, design, and ornamentation of a classic Italianate Style dwelling.

The other buildings on the property are part of the setting of the Campbell Farmhouse, but they do not contribute to its significance. They represent changes made to the property in the 1940s and 1950s that replaced the earlier outbuildings and farm structures that would have been associated with the farmhouse historically. A two-tone concrete block dairy barn from ca. 1948 is located behind the farmhouse to the east (Appendix C: Photograph 4). The upper story of the main section of the barn has a frame structure clad with faux brick asphalt sheeting over vertical wood boards. A contemporary one-story milkhouse section is appended to the south elevation of the barn, and two concrete stave silos from ca. 1954 are located behind the barn to the east. A small frame barn that appears to date to ca. 1948 is located to the east of the barn but was not visible for survey with limited access to the property. A secondary dwelling, built ca. 1940, is located to the north of the dairy barn closer to Greenbag Road (Appendix C: Photograph 4). The one-story front gable dwelling is vacant and is in a partially dilapidated state with a partially removed front porch and collapsing roof. It is clad with a mixture of particle board, plywood, and weatherboard. There is also a small outbuilding from ca. 1940 located at the end of a row of pine trees to the southwest of the farmhouse. The one-story, rectangular plan outbuilding appears to have a structure composed of both concrete block and frame. It has a front gable roof that is covered in tar paper and an exterior brick chimney on the west (side) elevation.

The Campbell Farmhouse retains its integrity. Despite a few alterations to its historic form (replacement windows and roofing as well as minor changes to the fenestration pattern), the farmhouse retains its integrity of design, materials, and workmanship. Its location remains intact, and its immediate setting remains rural and agricultural though the surviving outbuildings date from a later period. Its larger setting has been impacted by the loss of more than 100 acres of farmland and relatively dense highway-oriented suburban development. The Campbell

Farmhouse retains the feeling of a late 19th century Italianate farmhouse, but it lacks the association with former outbuildings and farmland.

The deed history for the property refers to the bulk of the farm (about 100 acres) as the Bunner Home Farm, but also associates the property with a 26-acre holding that formerly belonged to the Campbell Family that was consolidated in the late 19th century (Monongalia County Deeds). A detailed map of the Morgan District from 1886 identifies the home of Dr. F. Campbell at the approximate location of the farmstead, and the deed history suggests that it was around this era that the farm was established, which is corroborated stylistically by the architecture of the Italianate farmhouse. L.F. Campbell was listed in the 1880 federal population census as a 59 year old physician suffering from rheumatism, who was living in the Morgan District of Monongalia County with his wife Eliza and his 14 year old son William (US Census 1880).

By 1911, the farm with the Campbell Farmhouse was fully under the control of the Bunner family and being referred to as the Bunner Home Farm. In that year, the property was transferred by the last will and testament of Emma J. Bunner to her husband Francis M. Bunner and their son Thompson Orth Bunner (Monongalia County Wills 1911). The 1910 population census records 60 year old Emma J. Bunner living on the farm with her husband, who was a steamboat engineer, their son Arthur, who was a farm laborer, a servant, and three boarders (US Census 1910). Ten years later in 1920, the census describes Orth T. Bunner as a 34 year old farmer living on a dairy farm with his wife Bessie and their 13 year old nephew (US Census 1920).

In 1920, the deed recording the sale of the farm from Thompson Orth Bunner to a single woman named Mabel Student provided additional information about the personal property situated on the Bunner Home Farm:

> Seventeen (17) head of milch cows; three (3) heifers coming two years old; one (1) registered Holstein Bull; five (5) head of calves six months old; all dairy equipment including Empire Mechanical Milker and gasoline engine; two (2) road wagons; one (1) milk wagon, plow, harrows, and all other machinery now on said farm, three (3) head of work horses, one thousand dollars ($1,000.00) worth of stock in a Percheron Stallion named “Impotent” and two (2) sets of work harness (Monongalia County Deeds 1920).

The deed also referenced a silo on the property, which predated the two ca. 1954 silos located there currently. The following year, Mabel Student sold the 126-acre property to George Yuhost and Howard Jenkins and made reference to additional farm equipment—two mowing machines, one hay fork, plows, cultivators, one grain drill, and one corn drill—in the deed (Monongalia County Deeds 1921).

Howard Jenkins and his wife Goldie Pearl Jenkins lived on the dairy farm with their children through the 1930s and 1940s (US Census 1930 and 1940). Beginning ca. 1940, the concrete block outbuilding and the frame secondary dwelling were added to the property. Ca. 1948, a concrete block dairy barn with milkhouse and a smaller frame barn were constructed; it is assumed that they replaced earlier barns and outbuildings. Ca. 1954, two concrete stave silos were erected between the two barns.

The former Bunner Home Farm continued to operate as a dairy farm under Jenkins, though by the early 1940s, sections of the farm began to be parceled off for sale. After the construction of Greenbag Road in the mid-1960s, which replaced a narrow rural road by excavating a slightly revised path at the current north edge of the farm parcel, the trend to make more of the former farmland available for development continued. The farm is currently surrounded by suburban development with non-historic church properties located to the south, west, and northwest; individual residences located to the west and north; a residential development located to the north; and commercial development located to the northwest, northeast, and east.

The Campbell Farmhouse is recommended as eligible for listing in the National Register of Historic Places (NRHP) under Criterion C for Architecture as an intact and evocative example of an Italianate farmhouse. The larger farm property was evaluated under Criterion A for Agriculture, but it failed to convey a sense of its historic appearance and production as a late 19th/early 20th century dairy farm. None of the Campbells, Bunners, and the Jenkinses appear to meet the requirements for significance under Criterion B. The property was not evaluated under Criterion D for its potential to provide information important to the understanding of history or prehistory.

The recommended National Register boundary for the Campbell Farmhouse relies on natural and manmade features to provide an appropriate context for the Italianate dwelling that includes substantial farmland within its 10.9-acre area as well as the numerous mid-20th century outbuildings that are part of the farmhouse's setting even though they do not contribute to its significance. The boundary begins on the north side following the top of the embankment above Greenbag Road that was created during the excavation and construction of the road in the mid-1960s; this embankment varies in height from roughly ten to seventeen feet. The top of the embankment is lined with trees, and its elevation obscures views of the roadway below. To the east and south, the recommended boundary follows the meandering path of Aaron Creek and its unnamed tributary, and to the west the boundary follows the driveway leading from Greenbag Road to the Covenant Evangelical Methodist Church.

The recommended period of significance for the property is ca. 1886 to represent the period when the Italianate farmhouse was built.

5.4 MG-2642 / House at 851 Greenbag Road

851 Greenbag Road



MG-2642 / House at 851 Greenbag Road is located in a suburban area to the southeast of the Morgantown city limits. The recent nearby development (post-2000) of a commercial warehouse complex (to the west) and a townhome residential plan (to the east) occupy former farmland.

The one-story hipped roof ranch residence has a partially-exposed basement level featuring an integral two-car garage (Appendix C: Photograph 5). A one-bay front porch was added to the house ca. 2010 and a three-season rear enclosed porch was added ca. 2010. A lower level side porch was also added ca. 2010.

MG-2642 / House at 851 Greenbag Road represents an unremarkable example of a common house type from the postwar era (ca. 1970). It does not appear to be associated with any significant events; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

5.5 MG-2643 / Mountaineer Mall
5000 Greenbag Road

MG-2643 / Mountaineer Mall is located on the south side of Greenbag Road and east of Route 119 on a bluff above the Monongahela River. The shopping mall is surrounded by wooded areas as well as commercial and industrial buildings, the majority of which were built after construction of the mall was completed. The mall is located approximately 1.66 miles southwest of Morgantown.

The Mountaineer Mall, an approximately 500,000 square foot steel frame enclosed shopping center, was constructed in 1974 by Dill Construction Company of Latrobe, Pennsylvania (Appendix C: Photographs 6-8 [Morgantown Dominion-Post 1974]). The original architect of the mall is presently unknown. Its original footprint was a long, roughly rectangular shape with small asymmetrical projections on each elevation. The shopping mall is covered in stretcher bond brick, aluminum panels and tiles, and smooth and rock faced concrete block in portions of the rear (southeast) elevation. The mall features multiple entrances, each with a variation of a Post Modern projecting semi-circular arched entryway that likely dates from the ca. 1987 additions and updates to building. The ca. 1987 addition projects from the northwest elevation of the mall.



The present main entrance to the mall is located on the northwest corner of the ca. 1987 addition. The angled entrance leads to a wide walkway that travels diagonally through the double height addition. Interior materials include terrazzo floors, glazed brick and tile pilasters decorating the walls, and brick veneer applied to some walls. The interior is decorated with simple free standing wood planters along with L-shaped and triangular planters covered in white tile. Decorative domed recessed lighting with simulated leading is located in the center of the addition. The addition is connected to the original portion of the mall by a terraced walkway

flanked by steps featuring a wood handrail with brass railings. Clerestory windows are located above the central cross axis of the original 1974 section of the mall. The 1974 section is organized along a wide double loaded corridor with a secondary perpendicular walkway providing access to some of the shopping mall's original anchor tenants at the center of the complex. The northeast and southwest sections of the mall which originally housed anchor stores now function as office space.

The Mountaineer Mall brought the first large-scale, air conditioned multi-store shopping center to northern West Virginia (Latrobe Bulletin 1975). Laurel of Morgantown, a subsidiary of the Laurel Development Company of Latrobe, Pennsylvania, was responsible for the development of the 75 store mall whose anchor stores included Montgomery Ward, J.C. Penney, G.C. Murphy, and a Giant Eagle grocery store. The mall was constructed by Dill Construction Company of Latrobe, Pennsylvania and was financed by Equibank N.A. of Pittsburgh, which had also financed two large scale hotels near Morgantown and an extended care nursing facility near the West Virginia University Hospital (Morgantown Dominion-Post 1974; Latrobe Bulletin 1975). The Mountaineer Mall saw its peak in the late 1970s and into the early 1980s. In 1990, however, the Morgantown Mall was opened nearby on the west side of the Monongahela River with direct access to Interstate 79 roughly two and half miles northwest of the Mountaineer Mall. Mountaineer Mall immediately lost one of its anchor stores when J.C. Penney relocated to the Morgantown Mall shortly after it opened. As more retailers left the mall in the late 1990s and into the first decade of the 2000s, the mall began to lease space for offices. Current tenants include Fresenius Kidney Care, Mylan, TeleTech, Focus Mon Learning Center, and Mountaineer Home Medical, as well as other retail and non-retail tenants (Way 2010).

No information was recovered linking the Mountaineer Mall to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the mall was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. Mountaineer Mall stands as a common and unexceptional example of late mid-century commercial architecture and construction technique. The mall was constructed by Dill Construction Company of Latrobe, Pennsylvania. However, the company was a small firm operating primarily in southwestern Pennsylvania and the mall is not a noteworthy example of the company's work. The mall has also undergone a loss of integrity due to a major addition, the removal of original interior decorative material, and alterations to original entrances in 1987. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.6 MG-2644 / Morgantown City Garage
2020 Mississippi Street



MG-2644 / Morgantown City Garage is located on the northeast side of Mississippi Street approximately 384 feet north of its intersection with Greenbag Road. The garage complex is set within an area of commercial and residential development approximately 1.39 miles south of the city of Morgantown.

The Morgantown City Garage was constructed between 1975 and 1976 by the Mellon-Stuart Company of Pittsburgh, Pennsylvania (Appendix C: Photographs 9-11 [Morgantown Dominion-Post 1975b, 1975c, and 1976]). The steel frame pole barn is covered in ridged metal cladding. The structure is capped by a low-pitched side gable roof covered in standing seam metal roofing. The front (southwest) elevation of the garage features four oversized vehicle-bay openings.

A ca. 1975 barrel vaulted, prefabricated storage outbuilding set atop concrete blocks is located west of the garage. A ca. 2000 storage barn resting on a poured concrete foundation is located northwest of the garage. The barn is covered in vertical siding and capped by a front gable roof covered in asphalt shingle. Four additional outbuildings dating to ca. 1995 are located northwest of the garage; however, they were not visible from the public ROW.

No information was recovered linking the Morgantown City Garage to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the building was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Morgantown City Garage was constructed by the Mellon-Stuart Company of Pittsburgh, Pennsylvania (Morgantown Dominion-Post 1975b, 1975c, and 1976). The company was incorporated in 1917 and represented the merging of two Pittsburgh construction companies, one of which was owned by local financier Thomas Mellon. While the company specialized in railroad related construction, it was responsible for the construction of many notable office buildings in downtown Pittsburgh. The company is considered one of the oldest continually operating construction companies in the United States (Funding Universe 2019). However, the Morgantown City Garage does not represent a noteworthy example of the company's work. The Morgantown City Garage stands as a common and unexceptional example of a late mid-century utilitarian building. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.7 MG-2645 / FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center 446 Greenbag Road

MG-2645 / Robert F. Kennedy Youth Center is an approximately 103-acre federal correctional institution complex located on the south side of Greenbag Road west of Kingwood Pike. The complex is located approximately 1.68 miles southeast of the city of Morgantown and is surrounded by dense woods to the south and east, while a collection of large commercial and industrial buildings are located to the west. As the complex is a functioning correctional institution, the buildings were not accessible during field survey.



The complex was constructed in 1968 and includes approximately 18 buildings. It currently functions as a minimum security Federal Correctional Institution (Appendix C: Photographs 12-15). The entrance of the complex features a sign made of brick piers; the area fronting Greenbag Road is delineated by a simple wood post fence. The buildings visible from the public ROW are one-story Ranch style buildings clad in polychrome brick with a frame structural system. The roof profiles include low pitched hipped roofs covered in asphalt shingle with overhanging eaves. The majority of the buildings in the complex are rectangular in plan with projecting wings. A 1968 article in the Morgantown Dominion News shows a photograph of a mid-century Modern building although its use was not disclosed. The building, which appears to be a focal point within the complex, is clad in stone veneer and features a stylized hyperbolic-type roof (see Appendix C: Photograph 11 [Morgantown Dominion News 1968]). The Robert F. Kennedy Youth Center was built in a campus style. The complex is surrounded by a driveway and has paved walking paths that connect the various buildings. Cobun Creek passes through the southern portion of the complex, and three footbridges carry the walking paths over the creek. The complex includes tennis courts and a baseball field. A review of modern aerial photographs indicates that two additional buildings were constructed in the southern section of the complex ca. 1997.

The Robert F. Kennedy Youth Center was constructed in 1968 using designs by C.E. Silling and Associates (known today as Silling Architects) from Charleston, West Virginia (Balchen 1971:13). The firm is the oldest continually operating architectural firm in West Virginia (Silling Architects 2018). Construction and planning was overseen by Gary Mote, who at the time was the principal architect with the Office of Facilities Development Division of the Federal Bureau of Prisons (Balchen 1971:15). According to a 1968 article in the Morgantown Dominion News, at the time the facility was dedicated the grounds included a large educational facility which housed classrooms, an auditorium, and an indoor swimming pool (Morgantown Dominion News 1968).

The facility was designed as a prototype for the experimental penal system model known as "unit management" and was considered a model for other correctional systems projects (Kasey 2015:51; Balchen 1971:15). In the unit management model, the juvenile offenders were put into groups of 50-200 and were managed by a multidisciplinary team. At the Robert F. Kennedy Youth Center, the juvenile offenders were referred to as students. The eventual goal was to "graduate" each student from the facility. The staff was to be available and approachable, and open communication between students and staff was encouraged. The housing units were referred to as cottages, and there were no fences or bars within the facility (Kasey 2015:51; Balchen 1971:15).

This experimental model resulted in reduced violence among inmates, reduced program costs, increased morale among inmates and staff, and lower recidivism rates, and it generally produced inmates who were better prepared to reenter society. Within a decade of its opening, the facility was transitioned to house adult male inmates and the unit management model was eventually adopted in prisons throughout the country (Kasey 2015:51; Balchen 1971:15). Today, the facility is known as the Morgantown Kennedy Center Federal Correctional Institution, and it houses non-violent offenders, the majority of which have committed crimes related to financial fraud.

The Robert F. Kennedy Youth Center is significant for its association with the penal history of the United States. The center was constructed as an experimental juvenile detention center employing the "unit management" penal system model. The model was considered a success and was eventually applied to adult correctional institutions across the United States. The website of the Federal Bureau of Prisons includes a historical timeline outlining significant events related to United States prisons beginning in 1891 when the Federal Prison System was established. The opening of the Robert F. Kennedy Youth Center in 1969 is included on this timeline; the center is recognized for the innovative concepts and programs it implemented. The establishment of the center represents a significant moment in the institutional history of the Federal Bureau of Prisons (Federal Bureau of Prisons 2018). For this reason, the Robert F. Kenney Youth Center is eligible for NRHP listing under Criterion A. No information was recovered linking the prison to individuals significant on the local, state, or national level. Therefore, the complex is not eligible for NRHP listing under Criterion B.

The Robert F. Kennedy Youth Center was designed by C.E. Silling and Associates. The firm is known today as Silling Architects and is the oldest continually operating architectural firm in West Virginia. The firm designed numerous buildings in West Virginia which included academic buildings, health care facilities, prisons, airports, courthouses, and banks (Gioulis 2011:3). However, because the complex was not accessible during field survey there is not enough information to confirm the significance or integrity of the architectural design. Eligibility under Criterion C is not able to be determined. The complex has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.8 MG-2646 / Patton Farm
87 Kingwood Pike

MG-2646 / Patton Farm is located within an approximately 9.9 acre parcel on the east side of Kingwood Pike, approximately 0.21 miles south of its intersection with Greenbag Road. The surrounding area consists of dense woods to the east and south and an area of residential and commercial buildings to the north in the vicinity of Kingwood Pike and Greenbag Road.

The primary resource of the Patton Farm is a ca. 1880, two-story frame farmhouse (Appendix C: Photograph 16). The house is clad in vinyl siding and rests on a roughly coursed stone foundation. The three-gable roof is covered in standing seam metal and a two-story ell projects from the rear (southeast) elevation. Fenestration consists of replacement, metal sash one-over-one windows. Pairs of historic-era quarter round windows are extant in the gable ends. A hipped roof porch supported by square wood posts wraps around the façade (northwest elevation) and side (northeast elevation) of the farmhouse. The porch floor appears to be undergoing repairs.



Outbuildings on the property include a ca. 1880 root cellar located south of the farmhouse (Appendix C: Photograph 17). The root cellar is constructed of coursed stone and is capped by a front gable roof covered in corrugated metal with vertical board in the gable ends. A historic-era frame shed (Shed #1) is located to the northeast of the farmhouse (Appendix C: Photograph 18). The shed is clad in clapboard and capped by a front gable roof covered in standing seam metal. Another historic-era frame shed (Shed #2) is located to the northeast of Shed #1 (Appendix C: Photograph 18). The shed is clad in board and batten siding and is capped by a shed roof covered in corrugated metal with exposed rafter tails. A ca. 1980 pole barn clad in standing seam metal is located north of the farmhouse (Appendix C: Photograph 19). Another outbuilding that dates to ca. 1990 is located northeast of the pole barn but was not visible from the public ROW.

The Patton Farm is located within a parcel of land historically associated with George Dorsey, one of the earliest settlers in this area of Monongalia County. Dorsey came to the area in 1807 and acquired over 1,000 acres from Jonathan Coburn who had settled in the area in the late 18th century (Core 1976:379-381; Monongalia County Deeds 1803). The Patton Farm first appears on an 1886 map of Monongalia County (Appendix A: Figure 7 [Lathrop, et. al 1886]). The house is identified as belonging to Dr. F. (Frederick) Patton, the husband of Eliza Patton, who was the daughter of George Dorsey Jr. (Butcher 1912:873).

In 1893, Frederick and Eliza Patton deeded 205 acres of land to Philip Fairchild Harner. The deed indicates the land was formerly from the estate of George Dorsey Sr. and a cemetery was

located on the property; the cemetery contained the graves of members of the Dorsey family and their servants (Monongalia County Deeds 1893). It is unclear if Philip Harner resided on the Patton Farm, as the 1900 population census indicates that he and his wife lived in the Greenmont area of Morgantown, which was to the north of the Patton Farm (US Census 1900). In 1902, Philip Harner conveyed the 205 acres to Jefferson and Virginia Smith (Monongalia County Deeds 1902). The 1910 population census lists Jefferson Smith as a 33 year old farmer living with his wife Virginia and their three young children (Jeanette, Ralph, and Mary). The 1920 population census more specifically indicates that Smith was a dairy farmer (US Census 1910 and 1920). A 1925 topographic map reveals that a mine was located southeast of the Patton Farm on the east side of Kingwood Pike (Appendix A: Figure 11 [USGS 1925]). Jefferson Smith died in 1933 and left his property to his wife Virginia (Monongalia County Wills 1933).

In 1947, Virginia Smith deeded approximately 9.9 acres of land, which is the present day acreage of the Patton Farm to her daughter Mary Virginia Smith (Monongalia County Deeds 1947). A 1957 topographic map reveals the Patton Farm also included a barn (not extant) which was likely built in the late 19th or early 20th century and used by Jefferson Smith on his dairy farm (Appendix A: Figure 12 [USGS 1957]). The mine referenced in the 1925 map was no longer extant. The area to the southeast and southwest of the Patton Farm was largely undeveloped (USGS 1957). Mary Smith died in 1991 and left the property to the Robert M. Hastings Trust. The land was conveyed to Dewey Samuel Hastings, Mary's nephew, in 1998 (Monongalia County Deeds 1998).

A modern aerial photograph reveals that the barn referenced in the 1957 topographic map has been demolished and replaced with a ca. 1980 pole barn (Google Earth 2018). Areas of residential development dating to the 1960s and 1970s are located northwest of the house on the north side of Greenbag Road. The area southeast of the Patton Farm comprises dense woods. The sprawling complex of the Morgantown Kennedy Center Federal Correctional Institution is located west of the Patton Farm on the west side of Kingwood Pike.

The Patton Farm is not eligible for NRHP listing under Criterion A. Although the property was associated with dairy farming in Monongalia Township, the historic-era barn is no longer extant and the property no longer conveys its association with agricultural history. The Patton Farm is associated with Dr. Frederick Patton and his wife Eliza Patton as well as the Smith family. However, no information was recovered to suggest the Patton or Smith families were significant on the local, state, or national level. Therefore, the Patton Farm is not eligible for NRHP listing under Criterion B.

The Patton Farm has undergone a loss of integrity due to alterations to the farmhouse (including replacement windows, replacement siding and roof materials, the alteration of the large porch, and the removal of characteristic architectural elements) and the property (loss of the historic barn and historically associated farmland). For these reasons, the Patton Farm is not eligible for NRHP listing under Criterion C. The farm has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.9 MG-2647 / Anderson House
27 Kingwood Pike

MG-2647 / Anderson House at 27 Kingwood Pike is located within a 0.55 acre parcel on the east side of Kingwood Pike, approximately 254 feet south of its intersection with Greenbag Road. The house is located on a slope overlooking Greenbag Road. The surrounding area consists of open fields formerly used as farm land to the east and west and an area of residential and commercial buildings to the north.

The Anderson House is a ca. 1922, two-and-a-half-story American Four-Square house standing two bays wide and four bays deep (Appendix C: Photographs 20 and 21). The house rests on an ashlar stone foundation and is covered in stretcher bond brick. The hipped roof features overhanging eaves and is covered in asphalt shingle. The roof is pierced by two interior brick chimneys and includes three hipped roof dormer windows clad in vinyl siding. Fenestration consists of replacement one-over-one and vinyl sash windows with simple stone sills. The porch on the façade (west elevation) has been enclosed with vinyl sash hopper windows. The original entrance is located within the porch and an alternate entrance is now located on the south elevation. A one-story, partial width addition has been appended to the rear (east) elevation. A ca. 1980, two-bay detached garage clad in standing seam metal is located east of the house and a ca. 2010 pole barn located farther to the northeast was not visible from the public ROW.



The Anderson House was built ca. 1922 on land once owned by George Dorsey, an early settler who came to this area of Monongalia County in 1807 (Core 1976:381). Eliza (Dorsey) Patton and her husband Dr. Frederick Patton sold 73 acres of this land to George W. Morris in 1882 (Monongalia County Deeds 1882). An 1886 map of Monongalia County indicates there was no dwelling in the vicinity of the Anderson House at that time, although the land was occupied by J.E. Morris (Appendix C: Figure 7 [Lathrop, et. al 1886]). The residence of Dr. F. (Frederick) Patton is illustrated on the east side of the Kingwood, Morgantown, and West Union Turnpike (modern day Kingwood Pike) south of where the Anderson House is now located. The map also reveals that at this time, John Anderson (a future owner of the property) lived to the southwest of Frederick Patton along a no longer extant road. The greater vicinity at this time was dotted with dwellings along the established roadways. The Dorsey School House No. 1 was located north of John Anderson's land at the intersection of the Kingwood Pike and modern day Luckey Lane (Lathrop, et. al 1886).

In 1900, George Morris deeded his 73 acres to John Anderson and his wife Tillie (Monongalia County Deeds 1900). According to the 1900 population census, John Anderson was a 53 year

old farmer residing in a house with his wife Matilda (Tillie) and their three young sons (David J., Ray, and Roy) (US Census 1900). There is no dwelling indicated in the vicinity of the Anderson House on a 1902 topographic map. John Anderson died in 1913, and his will stipulated that his land was to be divided among his three sons. In 1922, Tillie, Ray, and Roy Anderson conveyed their shares of the 73-acre property to David Anderson (referred to in the property deeds as John D. Anderson) (Monongalia County Deeds 1922). David and his wife Opal had also acquired 62 acres of adjoining land in 1919 (Monongalia County Deeds 1919). A 1925 topographic map indicates that the Anderson House was constructed by this time on the east side of Kingwood Pike (Appendix C: Figure 11 [USGS 1925]). The Dorsey School House and a church (Harner Chapel) were located to the north of the house at the intersection of the Kingwood Pike and Luckey Lane. Dwellings were located along the established roads to the east and south.

David and Opal Anderson acquired an additional 31 acres of land from John and Ella Frum in 1926 for a farm covering approximately 166 acres (Monongalia County Deeds 1926). The 1930 population census indicates that David Anderson was a 37 year old farmer working on his own dairy farm (US Census 1930). He lived in a household with his wife Opal (also age 37), their three young children (John D., Richard, and Eleanor), and two boarders who worked on the farm. A 1957 topographic map indicates the property also contained a barn (no longer extant), which was located northeast of the Anderson House and was likely built around the same time (Appendix C: Figure 12 [USGS 1957]). Dwellings were scattered intermittently along the Kingwood Pike to the south and more concentrated development was beginning to occur to the north. The area to the southwest of the Anderson House was largely undeveloped.

David Anderson died in 1975, and in 1979, his son Richard, along with his wife Rachelle Anderson, deeded the three tracts of land to his siblings Elinor Richards and John D. Richards (Monongalia County Deeds 1979). In 2011, the approximately one-half acre subdivided parcel containing the Anderson House was conveyed to Garrett Richards, a grandson of Elinor Richards (Monongalia County Deeds 2011c). The large field located to the east of the Anderson House remains in the Richards family as part of a separate tax parcel (Monongalia County Deeds 2011b). The garage located northeast of the house was constructed ca. 1980 (Google Earth 2018). Greenbag Road, which was constructed in the early 1960s, extends east-west to the north of the Anderson House. Areas of residential development dating to the 1960s and 1970s are located northwest of the house on the north side of Greenbag Road. The sprawling complex of the Morgantown Kennedy Center Federal Correctional Institution is located southwest of the Anderson House on the west side of Kingwood Pike. The complex was built in 1968 as the Robert F. Kennedy Youth Center before it was converted into a federal prison in the 1970s (Kasey 2015:51).

The Anderson House is not eligible for listing in the National Register of Historical Places (NRHP) under Criterion A. Although the house was associated with dairy farming in Monongalia County, the historic-era dairy barn and associated farm acreage are no longer extant, and the property no longer conveys its association with agricultural history. The house is associated with the Anderson Family, namely John Anderson and his son David; however, no information was

recovered to suggest that the Anderson family was significant on the local, state, or national level. Therefore, the Anderson House is not eligible for NRHP listing under Criterion B. The Anderson House has undergone a loss of integrity due to replacement windows, replacement roof materials, the enclosure of the front porch, and alterations to original door openings. The house does not possess the architectural merit necessary for listing in the NRHP. For these reasons, the Anderson House is not eligible for NRHP listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.10 MG-2648 / House at 1440 Dorsey Avenue

MG-2648 / House at 1440 Dorsey Avenue is located on the west side of Dorsey Avenue approximately 170 feet north of its intersection with Greenbag Road. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road approximately 1.61 miles southwest of the city of Morgantown.



The house at 1440 Dorsey Avenue is a one-and-a-half-story ca. 1915 Bungalow style dwelling partially clad in vinyl siding and wood shingle (Appendix C: Photograph 22). The house rests on a rock faced concrete block foundation and is capped by a side gable roof covered in asphalt shingle. Decorative brackets adorn the overhanging eaves. The roof is pierced by an interior brick chimney and features a front gable dormer on the façade (east elevation). Fenestration consists of replacement one-over-one vinyl sash windows and fixed glass block windows in the basement level. The integral front porch has been partially enclosed with vinyl siding. A ca. 1990 two-bay detached garage covered in vinyl siding and capped by an asphalt shingle front gable roof is located immediately south of the house (Appendix C: Photograph 18). A ca. 2000 combination garage and shed clad in vinyl siding and capped by an asphalt shingle gable roof is located west of the house (Appendix C: Photograph 18).

No information was recovered linking the house at 1440 Dorsey Avenue to events significant on the local, state, or national level. Therefore, the house is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, the house is not eligible for listing under Criterion B.

The house at 1440 Dorsey Avenue lacks integrity because it has undergone alterations including the replacement of siding, windows, and roof materials and the partial enclosure of the front porch. While the house maintains some characteristic architectural elements of the Bungalow house type and Craftsman style, such as the brackets in the eaves, it stands as a common and unexceptional example of its kind and does not possess the architectural merit necessary for listing in the NRHP. Higher style examples of the Bungalow and Craftsman styles can be found in the NRHP listed Chancery Hill and South Park Historic Districts located approximately one mile to the northwest. Therefore, it is not recommended eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.11 MG-2649 / Smith House
1436 Dorsey Avenue

MG-2649 / Smith House at 1436 Dorsey Avenue is located on the west side of Dorsey Avenue approximately 250 feet north of its intersection with Greenbag Road. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road approximately 1.58 miles southwest of the city of Morgantown.



The Smith House is a ca. 1915 two-story modified American Four-Square dwelling clad in vinyl siding and resting on a foundation covered in stucco (Appendix C: Photograph 23). The steeply pitched hipped roof is covered in asphalt shingle and features three cross gable wall dormer windows with gable returns that appear to be variants on the Free-Classic Queen Anne Style. The roof is pierced by one interior brick chimney. Fenestration consists of replacement one-over-one vinyl sash windows, one fixed diamond shaped vinyl sash window, and an altered fixed vinyl sash picture window. The full width hipped roof porch on the façade (east elevation) is supported by simple square columns and features a cross gable pediment.

No information was recovered linking the Smith House to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. During the first decades of the 19th century the house was owned by Jefferson Smith who owned the property at 87 Kingwood Pike (approximately 0.26 miles to the southeast on the east side of Kingwood Pike). However, no information was recovered to suggest that Jefferson Smith was significant on the local, state, or national level. Therefore, the Smith House is not eligible for listing under Criterion B.

The Smith House has undergone a loss of integrity due to replacement siding and roof materials, alterations to some original window openings, and the removal of other historic

materials. It stands as a common and unexceptional example of its style. Higher style examples of the Four-square type can be found in the NRHP listed Chancery Hill Historic District and South Park Historic District located approximately one mile to the northwest. The Smith House is therefore not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.12 MG-2650 / Atomic Grill
1451 Dorsey Avenue

MG-2650 / Atomic Grill is located on the east side of Dorsey Avenue immediately northeast of its intersection with Greenbag Road. The commercial building, which currently functions as a restaurant and commercial garage, is located in an area of mixed single family and multi-unit residences and commercial development approximately 1.60 miles southeast of the city of Morgantown.

The Atomic Grill, built in 1974, is a steel-frame commercial building clad with standing seam metal panels and resting on a concrete block foundation (Appendix C: Photographs 24 and 25). The main portion of the L-shaped building is a steel frame structure capped by a side gable roof with an eight bay garage for commercial trucks. A storefront entrance projects from the southeast elevation with plate glass walls and a flat roof with covered in standing seam metal. The building is surrounded by a parking lot.



The Atomic Grill was constructed in 1974 as the Wonder Hostess Outlet (Morgantown Dominion-Post 1975a). In the early 2010s, the building was re-purposed as the Atomic Grill. No information was recovered linking the Atomic Grill or the Wonder Hostess Bakery Outlet to events significant on the local, state, or national level. Therefore, the building is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the building was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Atomic Grill stands as a common and unexceptional example of late mid-century roadside commercial architecture. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.13 MG-2651 / Monongalia County Head Start / Dorsey School 1433 Dorsey Avenue

MG-2651 / Dorsey School is located on the east side of Dorsey Avenue approximately 320 feet north of its intersection with Greenbag Road. The school is located in an area of mixed single family and multi-unit residences and commercial development approximately 1.58 miles southeast of the city of Morgantown.

The Dorsey School is a one-story ca. 1920 Classical Revival school house clad with American common bond brick walls (Appendix C: Photographs 26 and 27). The hipped roof is covered in asphalt shingle. Fenestration consists of replacement one-over-one vinyl sash windows, fixed vinyl sash windows, and louvered metal windows. The windows feature simple brick sills. A non-historic one-story concrete block rear addition with a flat roof is appended to the east elevation. A deeply recessed entrance on the façade (west elevation) features a segmental arch entry accented with decorative brickwork. The modern replacement door is surrounded by a modern simple transom and what are likely original sidelights.



The Dorsey School was named for the Dorsey family who were among the first settlers in this area of Monongalia County (Core 1976:381). The land on which the school stands was likely once owned by members of the Dorsey family. A school house first appears in the vicinity of the present Dorsey School in an 1886 map of Monongalia County (Appendix A: Figure 7 [Lathrop, et. al 1886]). The Dorsey School House No. 1 was located on the east side of the Kingwood, Morgantown, and West Union Turnpike (modern day Kingwood Pike) at its intersection with modern day Luckey Lane. This was likely a frame, one-room schoolhouse. A 1902 topographic map shows a structure in the vicinity of the Dorsey School House No. 1 although it is not labeled as a school (Appendix A: Figure 10 [USGS 1902]). A later topographic map from 1925 illustrates a school on the east side of Kingwood Pike south of Luckey Lane that is presumed to be the subject building (Appendix A: Figure 11 [USGS 1925]). Today, the school houses the Monongalia County Head Start program.

The Dorsey School is associated with the education history of Monongalia County. However, scant information was recovered concerning the school and its role in a rural area of Monongalia County on the outskirts of Morgantown. Therefore, the school is not eligible for listing under Criteria A.

While the school was likely built on land owned and possibly given by the Dorsey family, the school itself is not associated with any members of the Dorsey family. Further, no information was recovered suggesting the school was associated with other individuals significant on the

local, state, or national level. Therefore, the school is not eligible for listing under Criteria B. The Dorsey School stands as a common and unexceptional example of educational architecture in Monongalia County. It has undergone alterations and additions including a large rear addition and the removal of original character defining elements. The Dorsey School does not possess high artistic value, represent the work of a master, or embody the distinctive characteristics of a type, period, or method of construction. Therefore, it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.14 MG-2652 / House at 1432 Dorsey Avenue

MG-2652 / House at 1432 Dorsey Avenue is located on the west side of Dorsey Avenue immediately west of its intersection with Luckey Lane. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road, approximately 1.58 miles southwest of the city of Morgantown.

The house at 1432 Dorsey Avenue is a ca. 1915 one-and-a-half-story Bungalow style dwelling covered in vinyl siding and synthetic wood shingle (Appendix C: Photograph 28). The house rests on a rock faced concrete block foundation and is capped by a side gable roof covered in asphalt shingle. The roof is pierced by an interior central chimney and a front gable dormer window is located on the façade (east elevation). The façade features a partially enclosed integral shed roof porch resting on a concrete block foundation. Fenestration consists of simulated three-over-one vinyl sash windows and sliding vinyl sash windows in the basement level. A one-bay garage capped by a front gable asphalt shingle roof and covered in vinyl siding is located immediately south of the house (Appendix C: Photograph 28). A shed roof connects the garage and house.



No information was recovered linking the house at 1432 Dorsey Avenue to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 1432 Dorsey Avenue lacks integrity because it has undergone alterations with replacement siding, windows, and roofing as well as a partially enclosed front porch. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.15 MG-2653 / House at 102 Luckey Lane



MG-2653 / House at 102 Luckey Lane is located on the northwest side of Luckey Lane approximately 237 feet northeast of its intersection with Dorsey Avenue. The house is located within an area of single family and multi-unit residences and commercial development northwest of Greenbag Road.

The house at 102 Luckey Lane is a ca. 1940 one-and-a-half story Minimal Traditional style dwelling covered in aluminum siding and capped by a side gable roof covered in asphalt shingle (Appendix C: Photograph 29). The roof is pierced by one exterior brick chimney. The house rests on a concrete block foundation and fenestration consists of fixed and sliding vinyl sash windows. A partial width, second story addition supported by brick piers has been appended to the façade (southeast elevation). The addition is capped by a front gable roof covered in asphalt shingle. A two-story, full width addition has been appended to the rear (northwest) elevation. Two shed roof porch additions resting on concrete block foundations are appended to the northeast and southwest elevations.

No information was recovered linking the house at 102 Luckey Lane to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 102 Luckey Lane lacks integrity because it has undergone alterations (including replacement siding, roofing, and windows) and multiple additions (including a second story addition on the façade). For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.16 MG-2654 / House at 104 Luckey Lane

MG-2654 / House at 104 Luckey Lane is located on the northwest side of Luckey Lane approximately 266 feet northeast of its intersection with Dorsey Avenue. The house is located within an area of single family and multi-unit residences and commercial development northwest of Greenbag Road.

The house at 104 Luckey Lane is a ca. 1940 one-story Minimal Traditional style dwelling clad in vinyl siding and resting on a concrete block foundation (Appendix C: Photograph 30). The house is capped by a side gable roof covered in asphalt shingle and pierced by an exterior brick chimney. Fenestration consists of replacement one-over-one and fixed vinyl sash windows. A shed roof porch supported by metal posts has been appended to the façade (southeast

elevation), while a one-bay garage capped by a side gable roof has been appended to the northeast elevation.



No information was recovered linking the house at 104 Luckey Lane to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 104 Luckey Lane lacks integrity because it has undergone alterations and additions including replacement siding and roof materials, alterations or original window openings, and a one-bay garage addition. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.17 MG-2655 / Mountain View Manor
1201 – 7304 Mountain View Manor

MG-2655 / Mountain View Manor is located on the southwest side of Dorsey Avenue approximately 0.13 miles north of the intersection of Dorsey Avenue and Greenbag Road. The multi-unit housing complex is located in an area of mid-century residential development with non-historic residential and commercial development to the west. A handful of early 20th century dwellings are located south of Mountain View Manor. The complex is located approximately 1.55 miles southeast of Morgantown.



Mountain View Manor is a three-story, multi-unit housing complex constructed ca. 1970 comprising seven rectangular buildings, each with 10 units. In each building, four units face the northwest elevation, four units face the southeast elevation, and two additional units are included on the ground level of the southeast elevation (Appendix C: Photograph 31). Each building features a one-bay, central entrance with segmented plate glass panels from the floor to ceiling on their northwest elevations. Entrances on the southeast elevations are simple doors with one plain side light. The three-story buildings with exposed basements are covered in applied stretcher bond brick and capped by side gable

roofs covered in asphalt shingle. The roofs feature a slight overhang in the gable ends and eaves. Fenestration consists of tripartite metal sash sliding glass windows. Each unit features an integrated porch, either on the northwest or southeast elevation, with a simple metal balustrade, floor to ceiling plate glass windows, and a door for access. Unit 1, located at the northeast end of the complex, contains offices on the ground floor while the remaining units are residential.

No information was recovered linking Mountain View Manor to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the housing units were historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. Mountain View Manor stands as a common and unexceptional example of late mid-century multi-unit residential architecture. It does not possess the architectural merit necessary to be considered eligible under Criterion C. The housing development has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.18 MG-2656 / House at 500 Parkway Drive

MG-2656 / House at 500 Parkway Drive is located on the northwest side of Parkway Drive immediately west of its intersection with Dorsey Avenue. The house is located in a ca. 1970 residential development; the greater area consists of single family and multi-unit housing and commercial development approximately 1.50 miles southeast of the city of Morgantown.

The house at 500 Parkway Drive is a ca. 1970, one-story Ranch style dwelling covered in applied stretcher bond brick and vinyl siding and capped by a side gable roof covered in asphalt shingle (Appendix C: Photograph 32). The one-story dwelling rests on a concrete block foundation. Fenestration consists of one-over-one vinyl sash windows and a tripartite picture window on the façade (southeast elevation). The façade features a pedimented porch supported by simple columns. A partial width porch projects from the rear (northwest) elevation.



No information was recovered linking the house at 500 Parkway Drive to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision

and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.19 MG-2657 / House at 502 Parkway Drive

MG-2657 / House at 502 Parkway Drive is located on the northwest side of Parkway Drive immediately west of its intersection with Dorsey Avenue. The house is located in a ca. 1970 residential development; the greater area consists of single family and multi-unit housing and commercial development approximately 1.50 miles southeast of the city of Morgantown.



The house at 502 Parkway Drive is a ca. 1970, one-and-a-half story Modern Split-Level dwelling covered in applied stretcher bond brick and aluminum siding (Appendix C: Photograph 33). The house rests on a concrete block foundation and is capped by a gable roof covered in asphalt shingle. The L-shaped house features a two-story, projecting front gable with a garage on the ground level. A one-story ell projects from the northeast elevation of the front gable section of the house. An integral porch supported by simple square posts is located within the ell. The entry door within the porch is flanked by simple sidelights. Fenestration consists of double hung aluminum sash, simulated six-over-six windows and tripartite sliding windows.

No information was recovered linking the house at 502 Parkway Drive to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.20 MG-2658 / House at 693 Greenbag Road

MG-2658 / House at 693 Greenbag Road is located on the north side of Greenbag Road immediately east of its intersection with Richard Avenue. The house is located in an area of mixed residential and commercial development approximately 1.53 miles southeast of the city of Morgantown.



The house at 693 Greenbag Road is a ca. 1955 frame Ranch style building clad in applied stretcher bond brick and vinyl siding (Appendix C: Photograph 34). The side gable roof is covered in asphalt shingle and features overhanging eaves in the gable ends. Fenestration consists of sliding, fixed, and one-over-one metal sash windows. A partial width shed roof porch is appended to the façade (southeast elevation). An integral garage is located on the side (northeast elevation). A ca. 1980 two-bay detached garage clad in vinyl siding and capped by a side gable roof covered in asphalt shingle is located north of the house (Appendix C: Photograph 35).

No information was recovered linking the house at 693 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.21 MG-2659 / House at 703 Greenbag Road

MG-2659 / House at 703 Greenbag Road is located on the north side of Greenbag Road approximately 180 feet east of Richard Avenue. The house is located in an area of mixed residential and commercial development approximately 1.54 miles southeast of the city of Morgantown.

The house at 703 Greenbag Road is a heavily altered two-story American Four-Square dwelling from ca. 1900 that has been converted to offices for commercial use (Appendix C: Photograph 36). The house is clad in vinyl siding and capped by a steeply pitched hipped roof covered in asphalt shingle. The historic foundation material has been covered with applied brick. Fenestration consists of replacement one-over-one vinyl sash windows. A non-historic one-story addition clad in applied brick has been appended to the façade (southeast elevation) while a

non-historic one-story addition covered in vinyl siding has been appended to the rear (northwest) elevation. A ca. 1990 three-bay detached commercial-scale garage covered in standing seam metal is located immediately northwest of the house (Appendix C: Photograph 37).



No information was recovered linking the house at 703 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 703 Greenbag Road lacks integrity and has undergone extensive alterations and additions including front and rear additions, replacement siding and roof materials, and alterations to the original fenestration pattern and window openings. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.22 MG-2660 / House at 710 Greenbag Road

MG-2660 / House at 710 Greenbag Road is located on the south side of Greenbag Road approximately 1.58 miles southeast of the city of Morgantown. The house is located adjacent to an open field while the area immediately to the north comprises a dense area of mixed residential and commercial development.



The house at 710 Greenbag Road is a ca. 1930 two-and-a-half-story American Four-Square type dwelling resting on a coursed rubble stone foundation (Appendix C: Photograph 38). The house is clad in vinyl siding and is capped by a steeply pitched hipped roof covered in asphalt shingle. The roof is pierced by an interior chimney and includes hipped roof dormer windows on the façade (northwest) and rear (southeast) elevations. An altered hipped roof porch supported by simple Doric columns with a balustrade decorates to the façade. Three non-historic additions have been added to the rear of the house to quadruple the area of the building's footprint. A two-story non-historic living space addition, a patio partially covered by a

shed roof, and a ca. 2000 one-story, three-bay garage have been appended to the rear of the house. Fenestration consists of replacement one-over-one vinyl sash windows with simulated eight-over-eight vinyl sash windows in the garage addition.

No information was recovered linking the house at 710 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 710 Greenbag Road lacks integrity because it has undergone alterations and additions including large rear additions, replacement siding and roof materials, alterations to original openings, and disruption of the original fenestration pattern. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.23 MG-2661 / Cobun Creek Culvert
Mississippi Street at Greenbag Road

MG-2661 / Cobun Creek Culvert carries Greenbag Road over Cobun Creek immediately to the northwest of Greenbag Road's intersection with Mississippi Street. The culvert is set within an area of commercial development and intermittent wooded areas approximately 1.45 miles south of the city of Morgantown.

The ca. 1965 culvert is a single span, reinforced concrete box culvert that carries Greenbag Road and fill over Cobun Creek (Appendix C: Photograph 39). The culvert is 71 feet in overall length with a span that measures 14 feet wide. The culvert includes tapered reinforced concrete wingwalls on its north and south elevations.



No information was recovered linking the Cobun Creek culvert to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the culvert was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Cobun Creek culvert stands as a common and unexceptional example of a concrete box culvert. It does not possess the architectural merit or technological significance to be considered eligible for listing under Criterion C. The culvert has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

5.24 MG-2665 / The Sube Shop
918 Greenbag Road

MG-2665 / The Sube Shop is located to the southwest of the intersection of Greenbag Road and Lower Aarons Creek Road with a broad partially-paved parking lot to the north and west. It occupies former farmland to the east of Aaron Creek in a semi-suburban area to the southeast of the Morgantown city limits.

The tall, one-story, rectangular plan service building, built ca. 1970, is prefabricated with a standing seam metal roof and wall cladding (Appendix C: Photograph 40). A one-story shed-roof office area clad with brick veneer is attached to the north (front) elevation. Five oversize vehicle bays line the west (side) elevation. Parking lots frame the building to the north and west.



The Sube Shop consists of an unremarkable and utilitarian prefabricated service building with a small office area. It does not appear to have significance as a commercial/service industry building; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

5.25 MG-2666 / Aaron Creek Box Culvert
Greenbag Road at Aaron Creek

The MG-2666 / Aaron Creek Box Culvert (Structure No. 31A203) is a two-span continuous concrete culvert that was built ca. 1966 by the Greer Limestone Co. (WVDOH 1990) (Appendix C: Photograph 41). It is a cast in place structure consisting of two sidewalls, a center wall, a floor slab, and a roof slab, with two ten-foot span openings and a total length of 20.8 feet. A 2018 inspection of the culvert found that the structure was in fair condition (WVDOH 2018). The culvert retains integrity despite regular repairs to the structure and the addition of safety guardrails ca. 1996 (WVDOH 1990).

The Aaron Creek Box Culvert was constructed when Greenbag Road was laid out in the mid-1960s. The Greer Limestone Company, who was responsible for its construction, was founded in 1914 and is still active today as part of Greer Industries, Inc (Greer Industries, Inc. 2006). In the late 1960s, when the construction of this culvert was included among the company's minor endeavors, Greer Limestone Company advertised itself as a local construction company with a location ten miles southeast of Morgantown in Greer, West Virginia (The Dominion News 1968). When the West Virginia Statewide Historic Bridge Survey was completed in 2015, the Aaron

Creek Box Culvert was not among the structures that were evaluated, which could have been due to its late build date or small size (KCI Technologies, Inc. et al. 2015).



The Aaron Creek Box Culvert is not eligible for listing on the National Register of Historic Places (NRHP). It is an unremarkable example of a common structure type that does not demonstrate technological or historical significance. It is not significant under NRHP Criteria A, B, or C. It has not been evaluated under Criterion D for its potential to provide information important to our understanding of history or prehistory.

6.0 RECOMMENDATIONS

Markosky surveyed 25 structures within the Project APE dating to 1975 or before. Of the 25 structures surveyed within the APE, two properties were recommended eligible for listing in the NRHP: MG-2641 / Campbell Farmhouse and MG-2645 / FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center. The Project has been designed to avoid and/or minimize any potential impacts to the farmhouse and the prison complex.

The recommended NRHP boundary of the MG-2641 / Campbell Farmhouse encompasses 10.9 acres of surviving farmland, the Italianate dwelling, and several mid-20th century outbuildings that are situated on a flattened hilltop above a steep embankment at the edge of Greenbag Road. Project activities in this area are currently being refined, but, at most, they may include limited cuts into the sloping embankment and the possible acquisition of required right-of-way (ROW) on the south side of Greenbag Road in the vicinity of the resource. It is assumed that these activities will occur either outside the property's recommended NRHP boundary or at its edge, where they will not have an effect on the Italianate farmhouse or its viewshed because they are screened by an existing buffer of trees and the elevational difference between the property within the boundary and the roadway below, which ranges between approximately ten to seventeen feet in height.

The MG-2645 / FCI Morgantown Kennedy Center prison complex is set back from Greenbag Road with the closest building located approximately 400 feet south of the road, which is well outside the project construction area. All Project construction work will take place within WVDOH ROW without impacting the buildings or the design of the complex. At the Greenbag Road entrance to the prison complex, the only planned alteration will be the removal and replacement or upgrade of the triangular island that splits traffic at the entrance. The island is a standard road element/device, and this example is of typical construction and is not of significance to the original prison complex design. There are no planned impacts to the existing wood rail fencing and signage that are associated with the prison property. Project related construction is not anticipated to impact any structures associated with the prison, and it will not compromise any of the character defining features of the complex.

The remaining structures surveyed within the Project APE lack either the integrity and/or the significance to be considered eligible for listing in the NRHP, and, thus, Section 106 effects do not apply to those structures.

Markosky recommends that the Greenbag Road Improvement Project work will not adversely affect any NRHP-eligible historic resources or structures and that no further historic structures investigations are needed. However, if any changes to the scope or design of the Project are introduced, additional historic structures investigations may be necessary.

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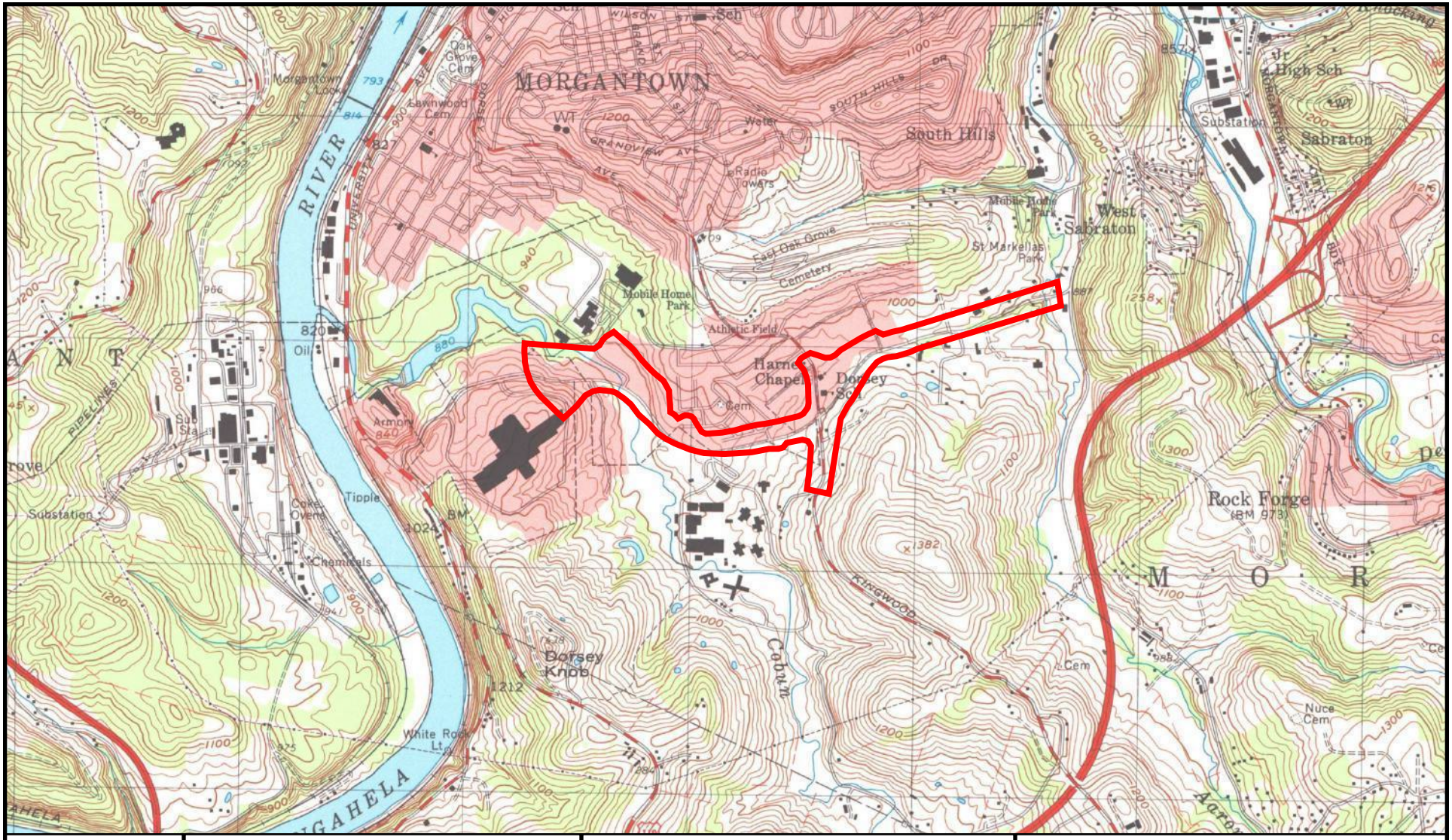
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APPENDIX A

FIGURES



N

W E

S

Feet

0 2000 4000

Meters

0 600 1200

MARKOSKY

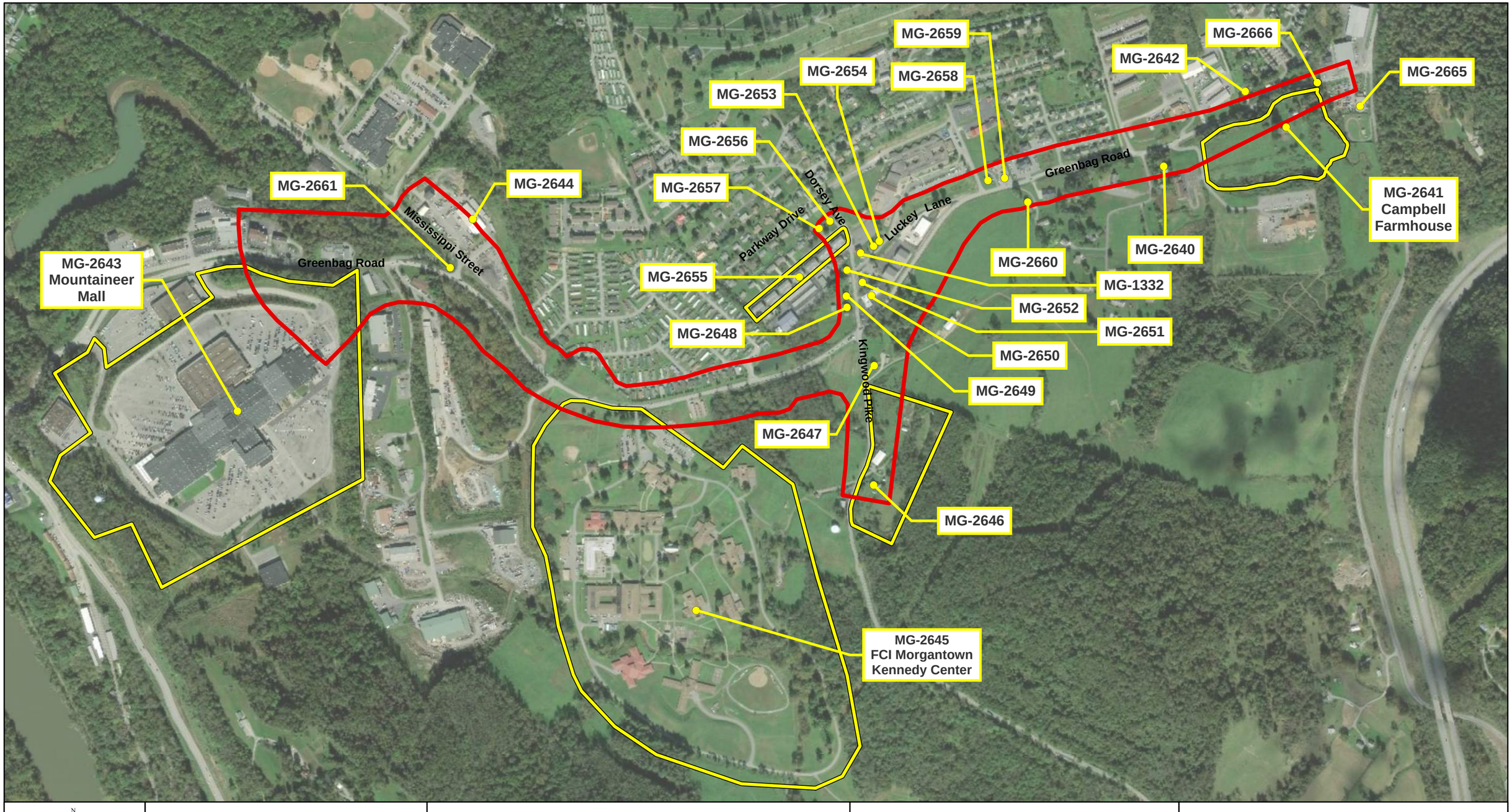
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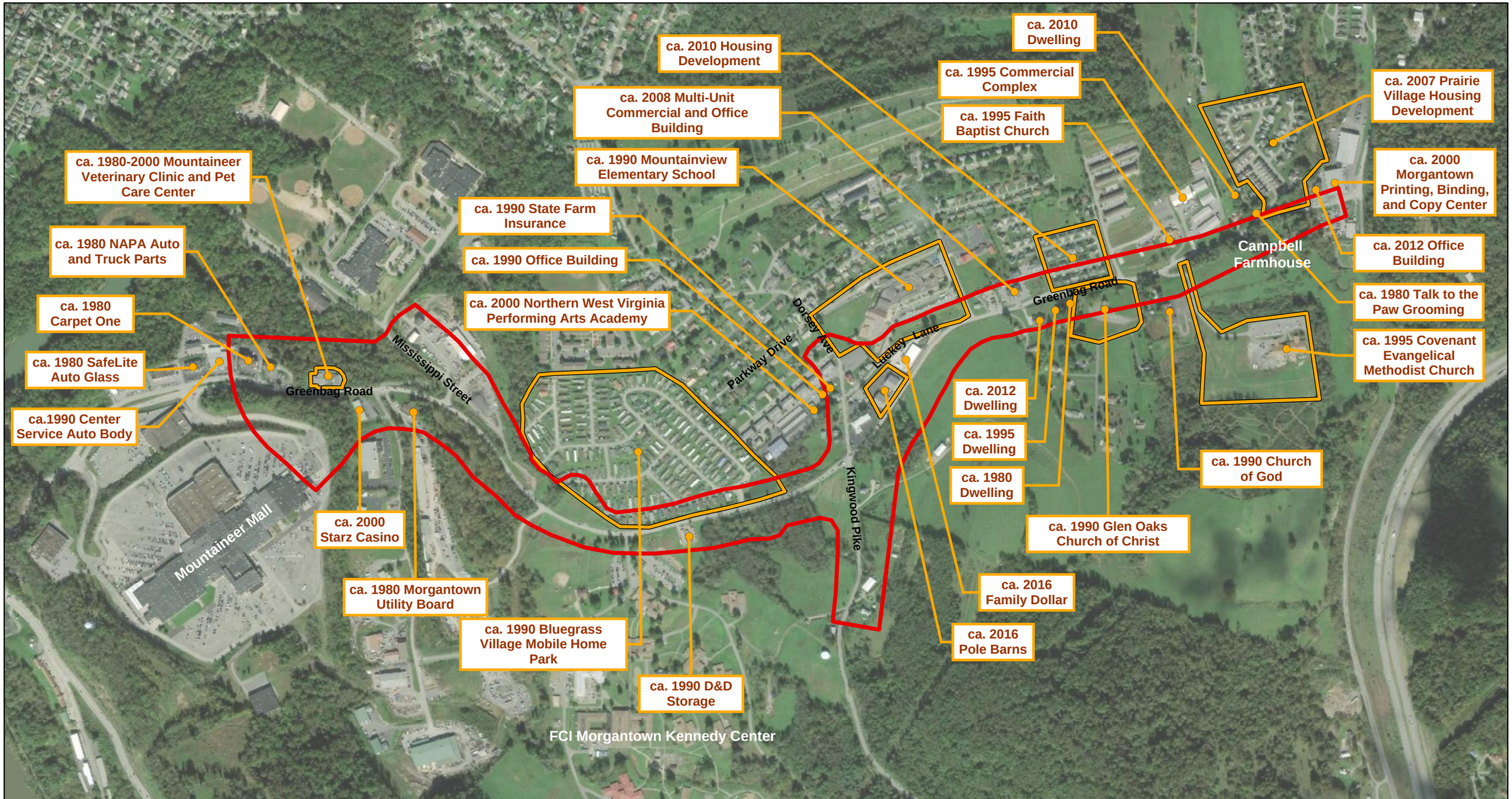
Historic Structures APE

Figure 1
Project Location

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County
Source: 7.5' USGS Topographic Quadrangle Morgantown South, WV 1997


MG-2659
MG-2666
MG-2642
MG-2654
MG-2658
MG-2665
MG-2653
MG-2656
MG-2661
MG-2644
MG-2657
Dorsey Ave
Greenbag Road
MG-2641
Campbell
Farmhouse
Parkway Drive
Luckey Lane
Mississippi Street
Greenbag Road
MG-2643
Mountaineer
Mall
MG-2660
MG-2640
MG-2655
MG-1332
MG-2652
MG-2648
MG-2651
MG-2650
Kingwood Pike
MG-2649
MG-2647
MG-2646
MG-2645
FCI Morgantown
Kennedy Center
N
W
E
S
Feet
0 400 800 1,200 1,600
Meters
0 100 200 300 400
MARKOSKY
Historic Structures APE
Historic Structure Boundary
Historic Structure
Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report
Morgan District and City of Morgantown
Monongalia County
Aerial Photography Source: World Imagery (ESRI 2018)
Figure 2
Historic Structures APE and Locations of
Historic Structures in the APE



N
W E
S

MARKOSKY

Feet
0 400 800 1,200 1,600

Meters
0 100 200 300 400

Historic Structures APE

Non-historic Structure Boundary

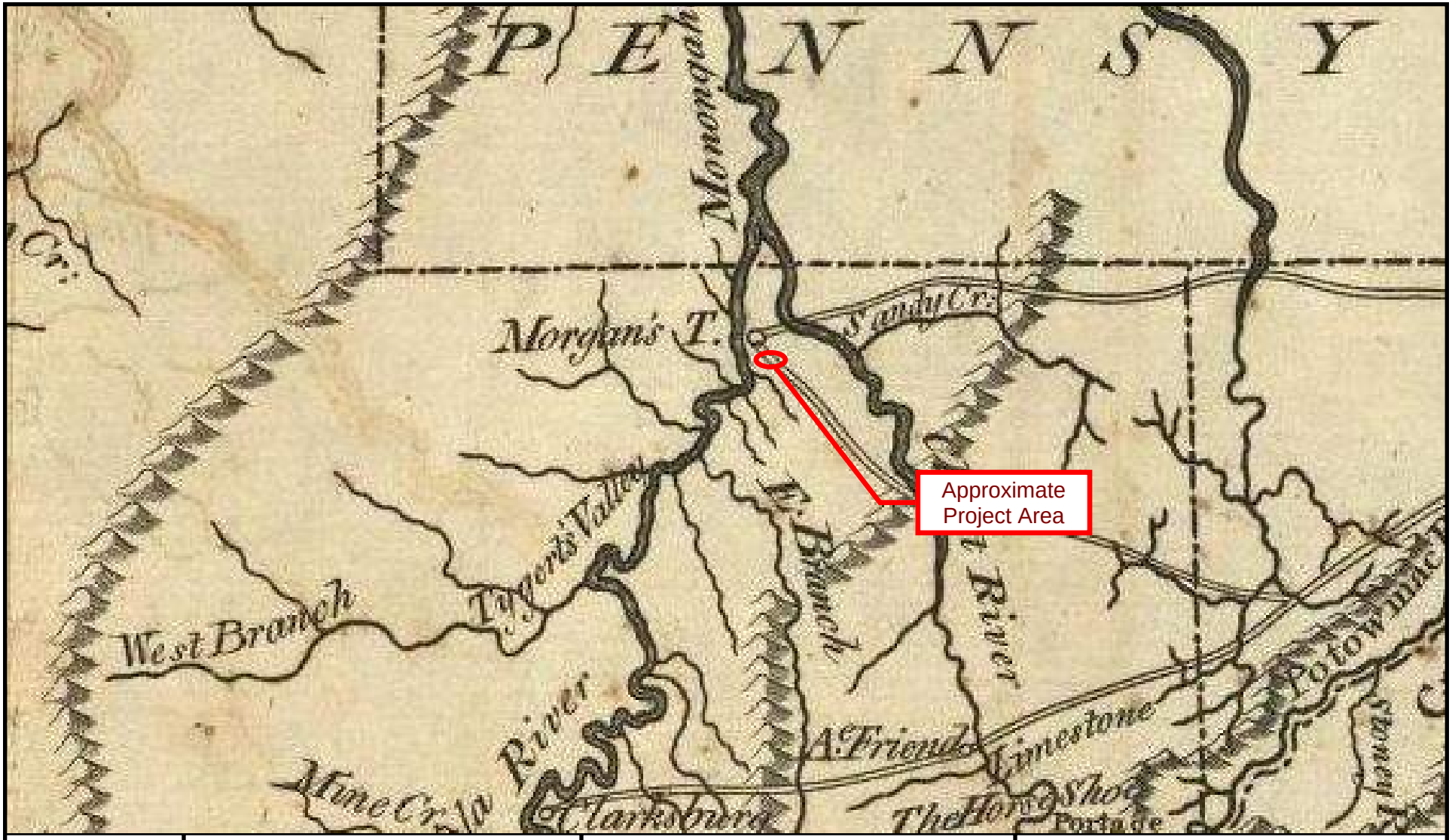
Non-historic Structure

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 3
Locations of Non-Historic Structures in the APE



N
W E
S

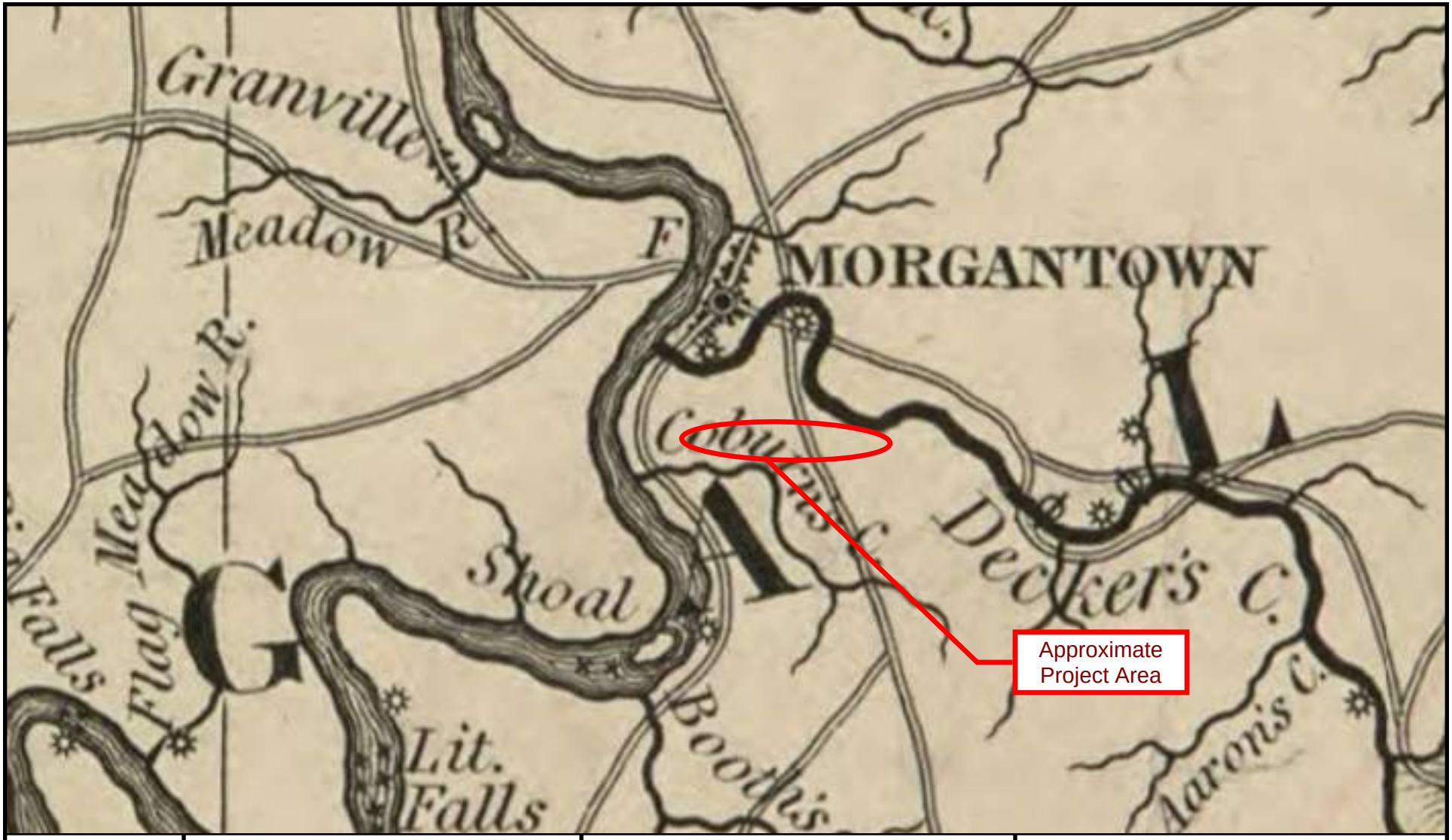
*Not to Scale.

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Figure 4
Approximate Project Area in 1795

MARKOSKY

Morgan District and City of Morgantown
Monongalia County
Source: Lewis 1795



N
W E
S

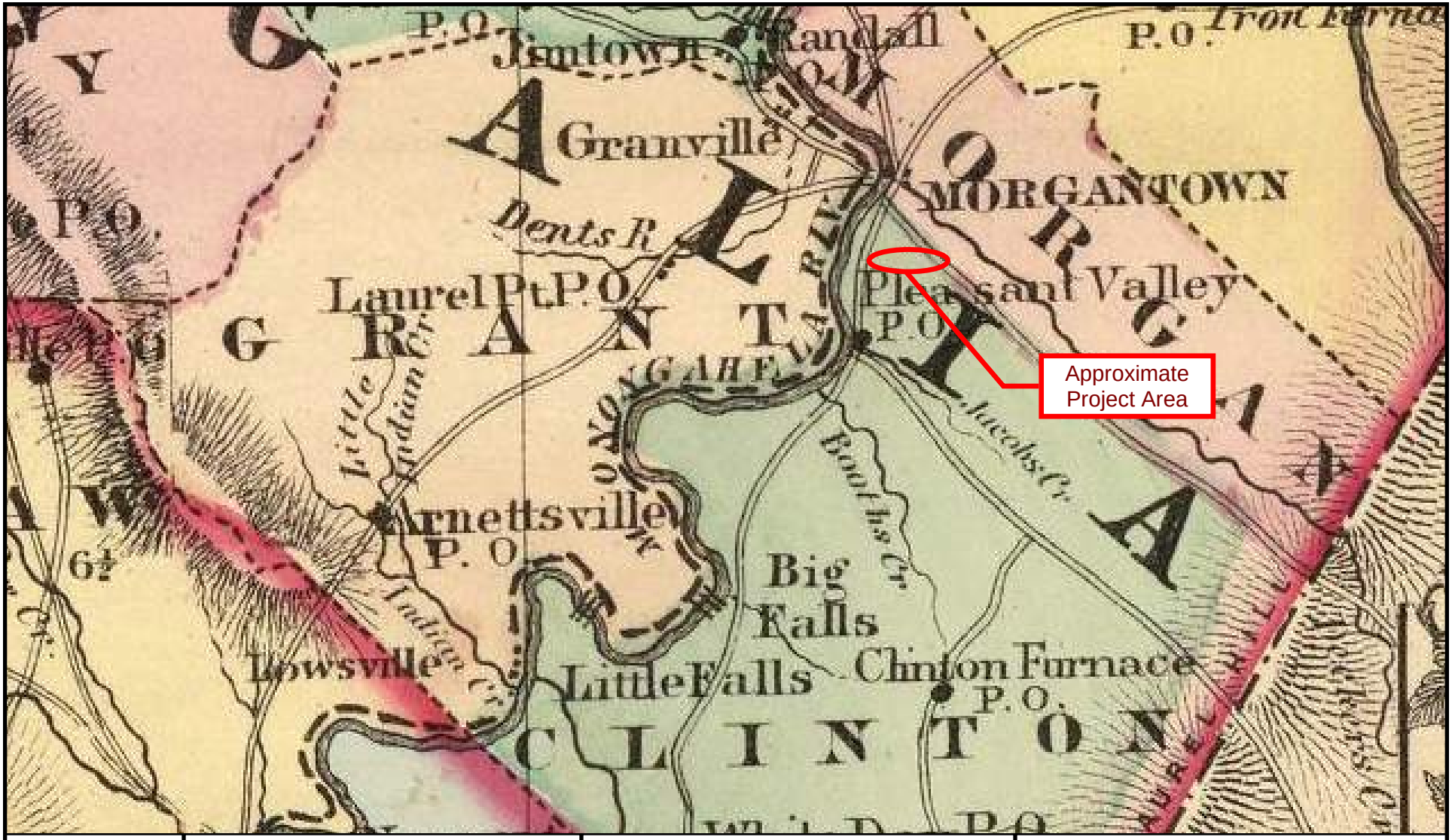
*Not to Scale.

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Figure 5
Approximate Project Area in 1827

Morgan District and City of Morgantown
Monongalia County
Source: Boye 1827

MARKOSKY



N
W E
S

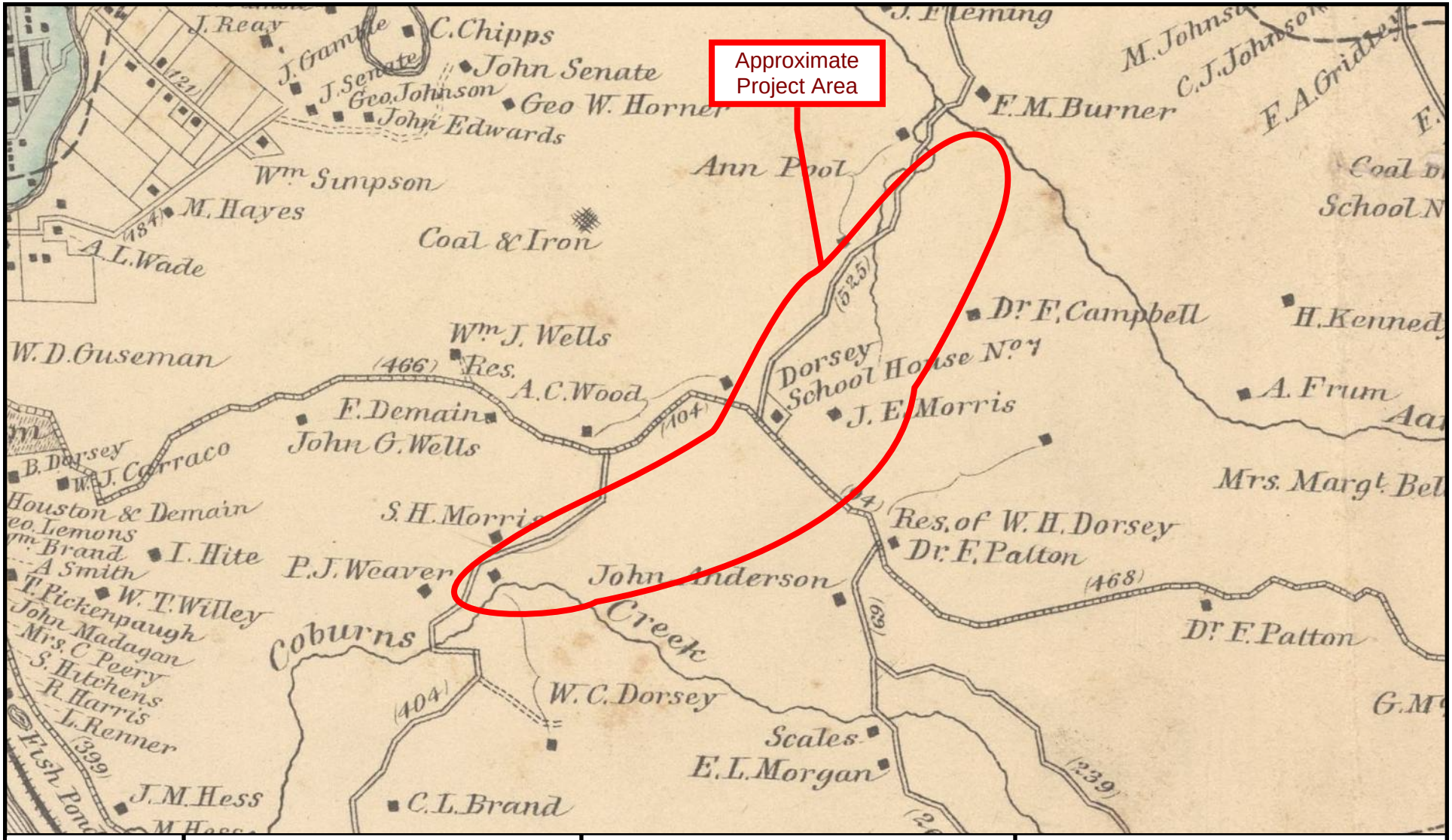
*Not to Scale.

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Figure 6
Approximate Project Area in 1873

Morgan District and City of Morgantown
Monongalia County
Source: White 1873

MARKOSKY



*Not to Scale.

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Figure 7
Approximate Project Area in 1886

Morgan District and City of Morgantown
Monongalia County
Source: Lathrop 1886

MARKOSKY



MARKOSKY

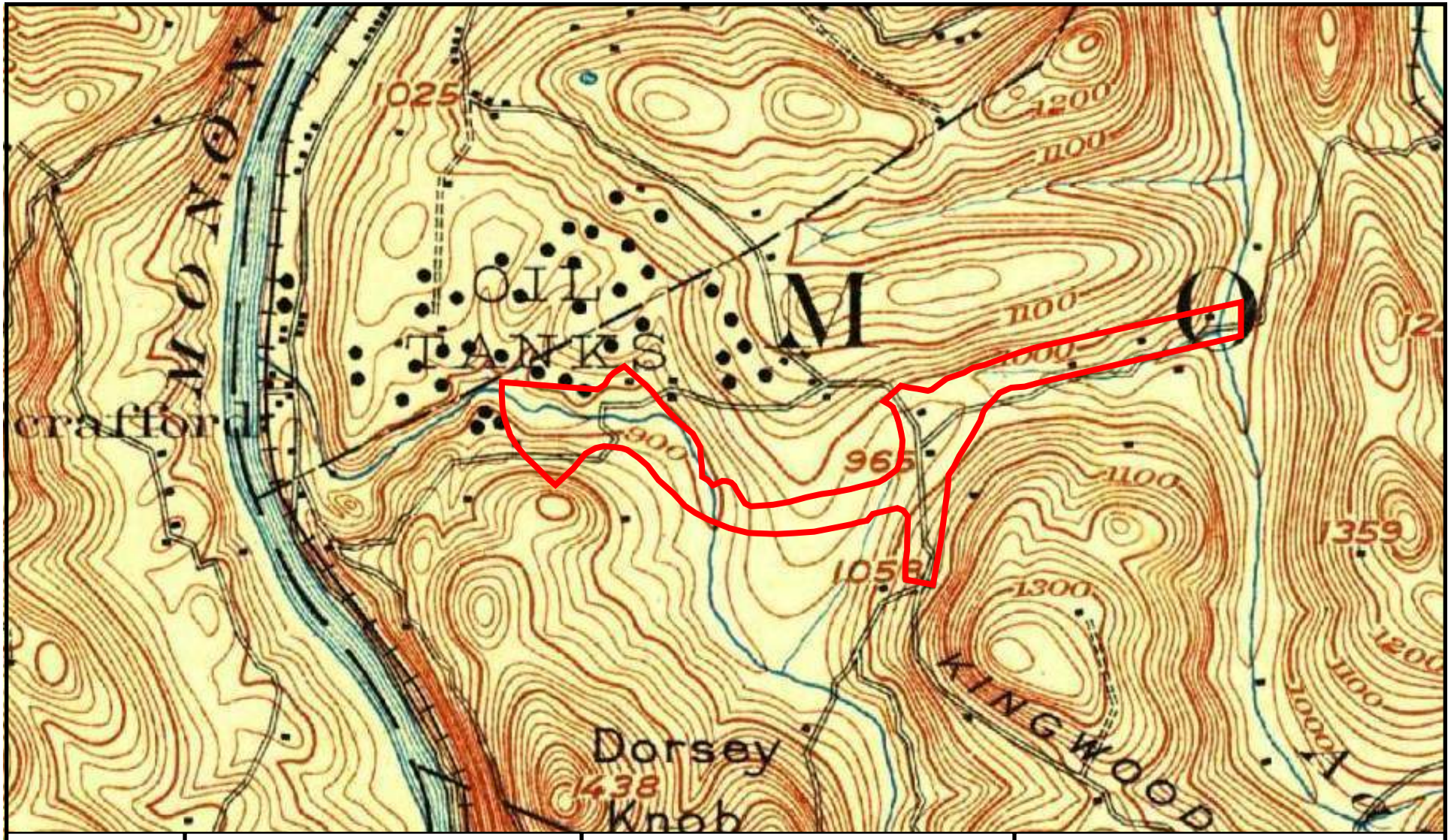
Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Figure 8
Oil Tanks in Morgantown ca. 1895

Morgan District and
City of Morgantown
Monongalia County
Source: WVU 1895a



MARKOSKY	Greenbag Road Improvement Historic Structures Survey and Determination of Eligibility Report	**Figure 9** Oil Tanks South of Morgantown ca. 1895	Morgan District and City of Morgantown Monongalia County ***Source: WVU 1895b***



N
W E
S

Feet
0 1500 3000

Meters
0 450 900

MARKOSKY

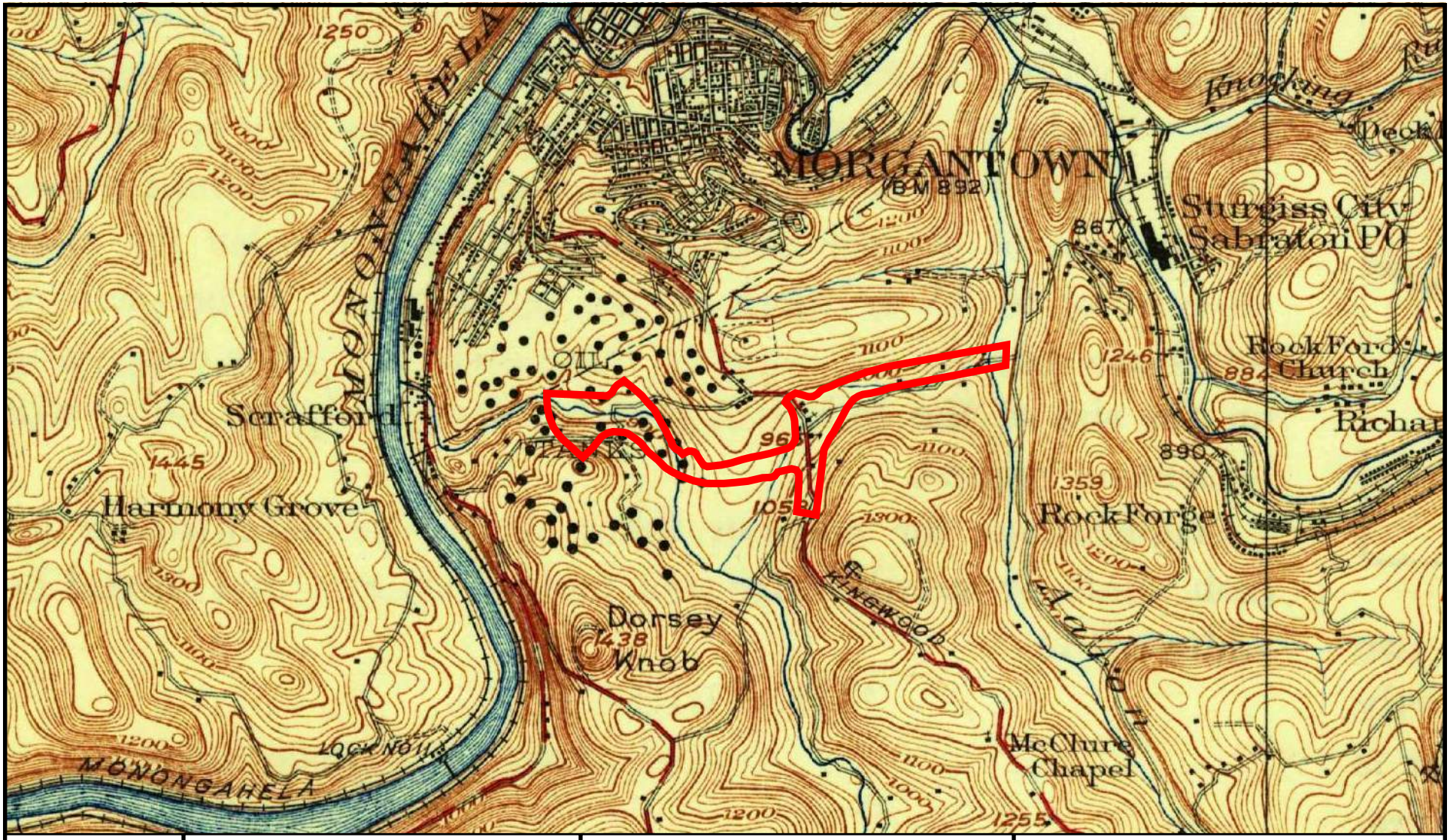
Legend

Historic Structures APE

Figure 10
Historic Structures APE in 1902

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County
Source: 15' USGS Topographic Quadrangle Morgantown, WV 1902



N
W E
S

Feet
0 2500 5000

Meters
0 750 1500

MARKOSKY

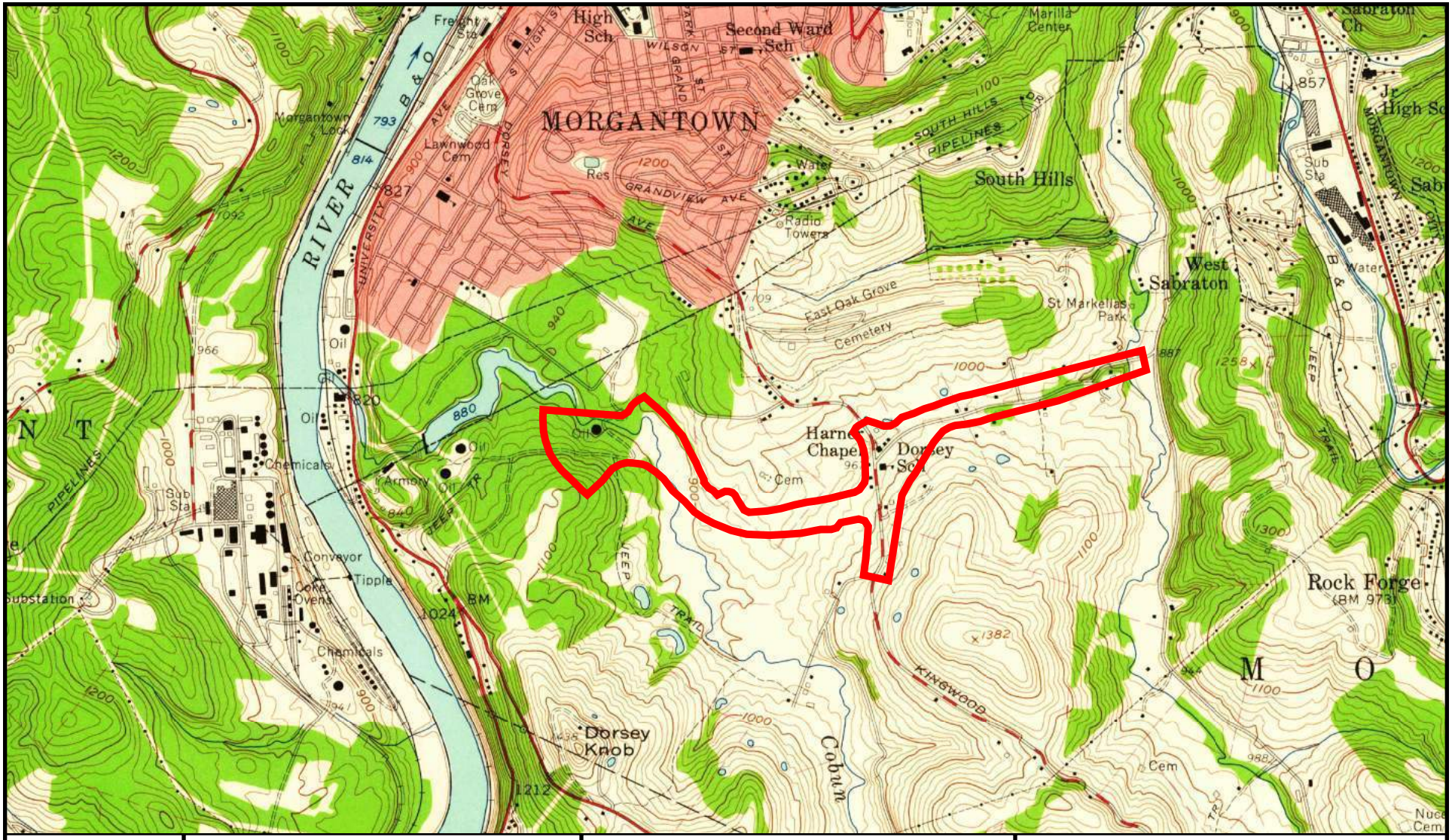
Legend

Historic Structures APE

Figure 11
Historic Structures APE in 1925

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County
Source: 15' USGS Topographic Quadrangle Morgantown, WV 1925



N
W E
S

Feet
0 2000 4000

Meters
0 600 1200

Legend

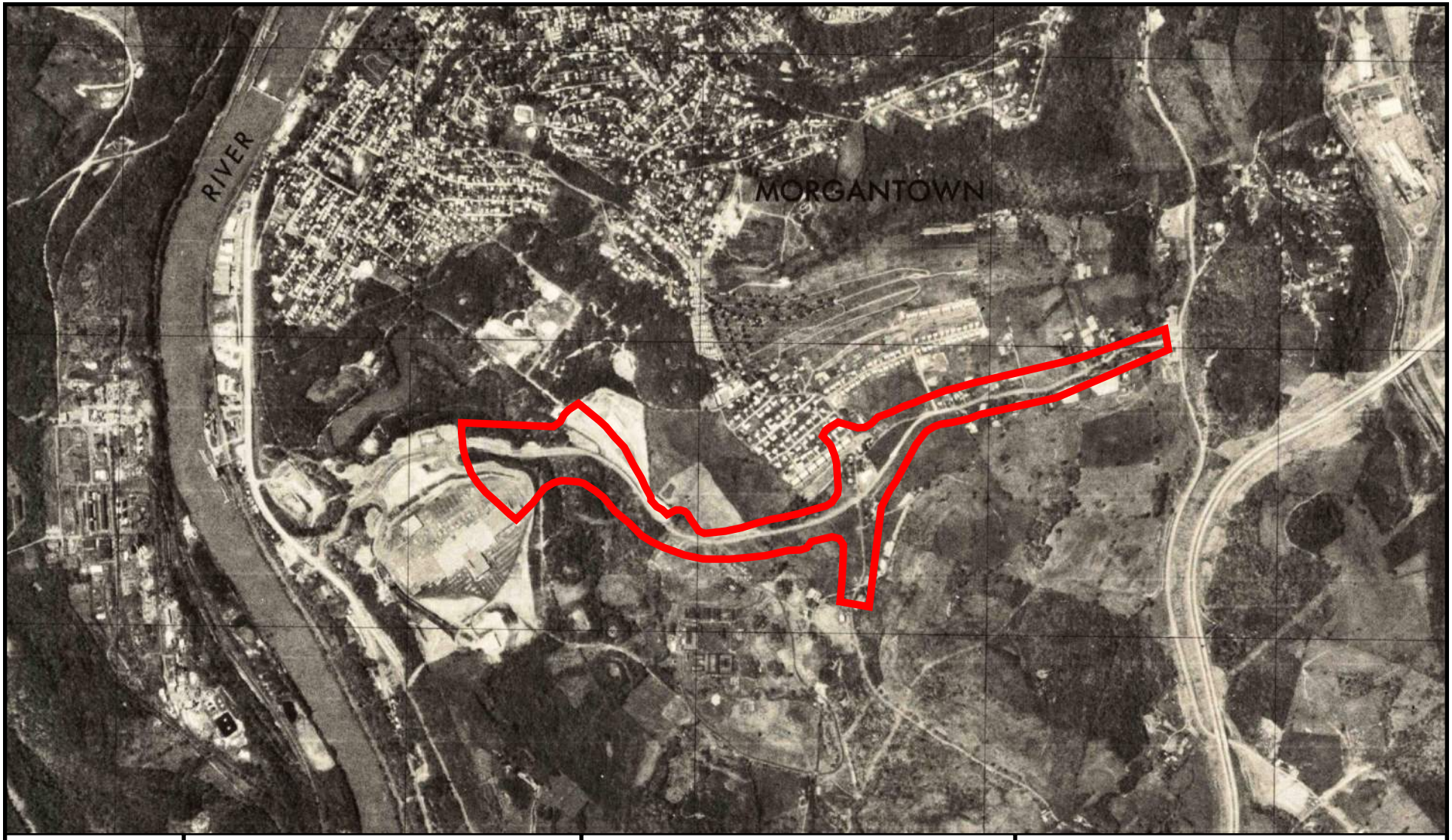
Historic Structures APE

Figure 12
Historic Structures APE in 1957

MARKOSKY

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County
Source: 7.5' USGS Topographic Quadrangle Morgantown South, WV 1957



N
W E
S

Feet
0 1600 3200

Meters
0 600 1200

MARKOSKY

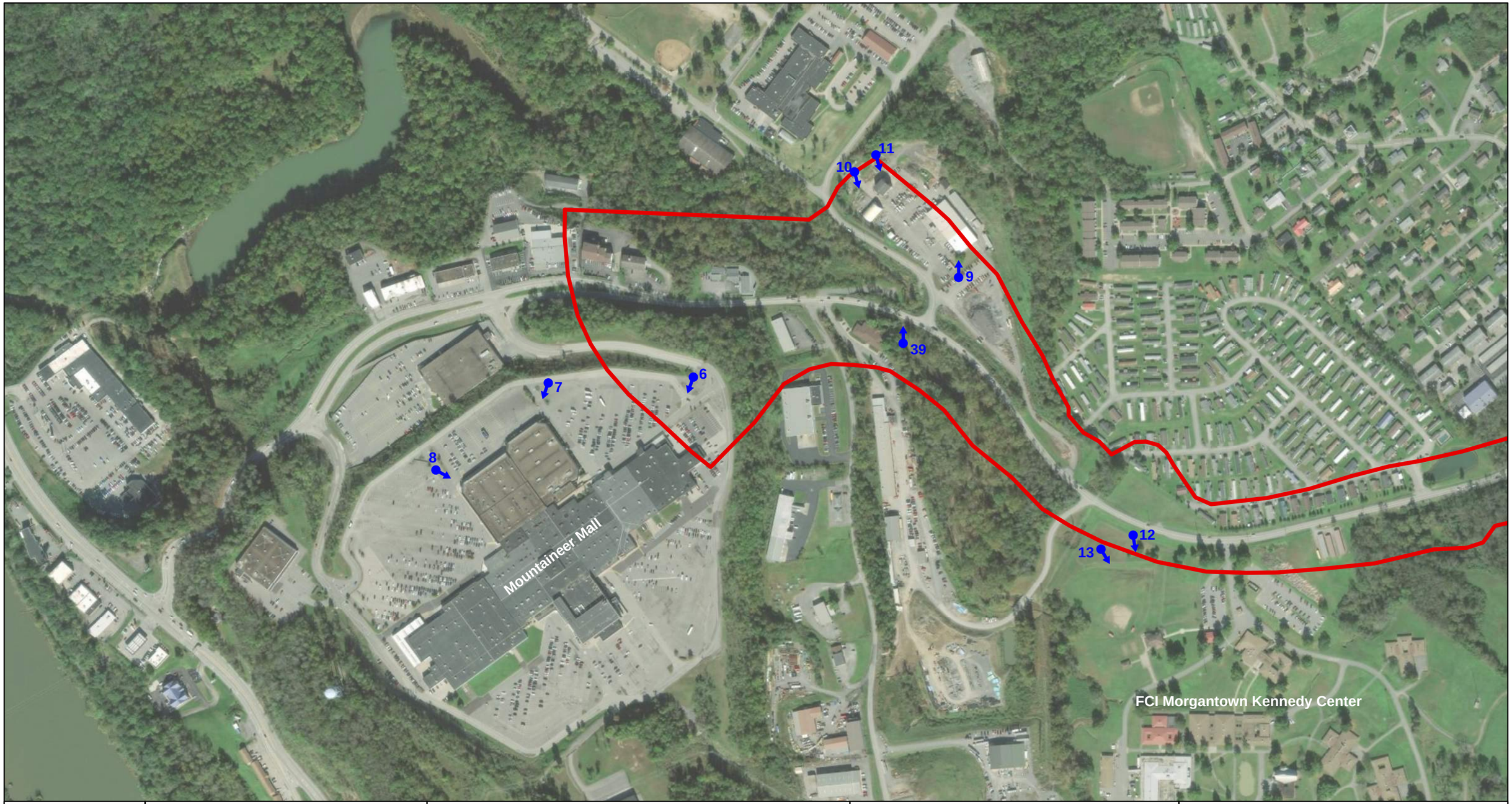
Legend

Historic Structures APE

Figure 13
Historic Structures APE in 1976

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County
Source: 7.5' USGS Orthophoto Quadrangle Morgantown South, WV 1976



N
W E
S

MARKOSKY

Feet
0 200 400 600 800

Meters
0 50 100 150 200

Historic Structures APE

Photograph Location

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

Morgan District and City of Morgantown
Monongalia County

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 14 - Sheet 1 of 2
Photograph Location Map



N
W E
S

MARKOSKY

Feet
0 200 400 600 800

Meters
0 50 100 150 200

Historic Structures APE

Photograph Location

Greenbag Road Improvement
Historic Structures Survey and
Determination of Eligibility Report

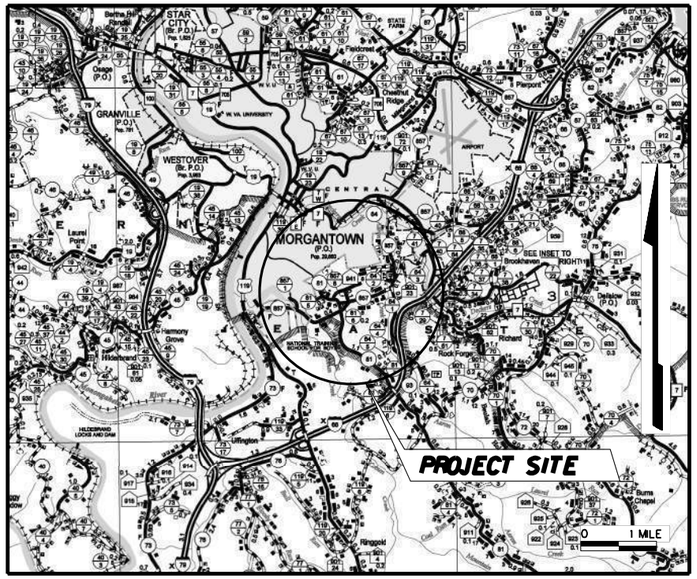
Morgan District and City of Morgantown
Monongalia County

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 14 - Sheet 2 of 2
Photograph Location Map

APPENDIX B

PRELIMINARY PROJECT PLANS AND DESIGN INFORMATION

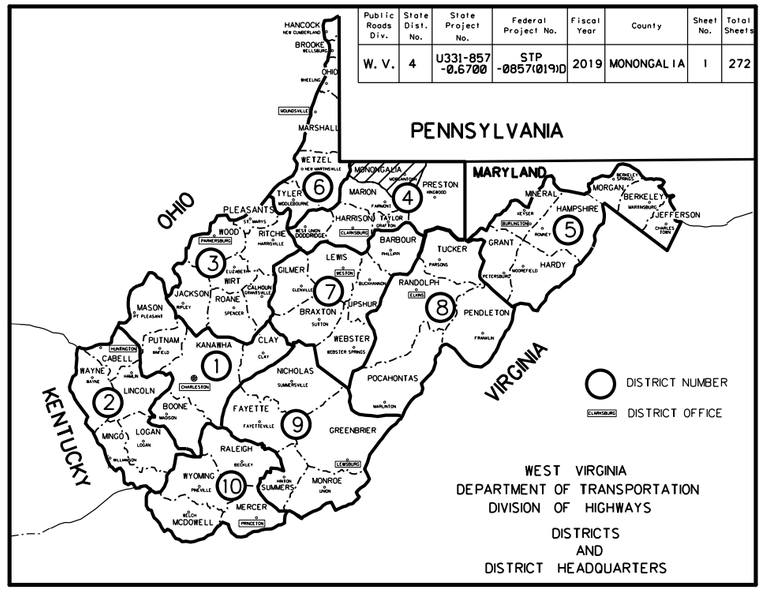


WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR CONSTRUCTION
OF
STATE HIGHWAY

FEDERAL PROJECT NO. STP-0857(019)D
STATE PROJECT NO. U331-857-067 00
STATE ROUTE NO. 857
MORGAN DISTRICT
MONONGALIA COUNTY

GREENBAG ROAD

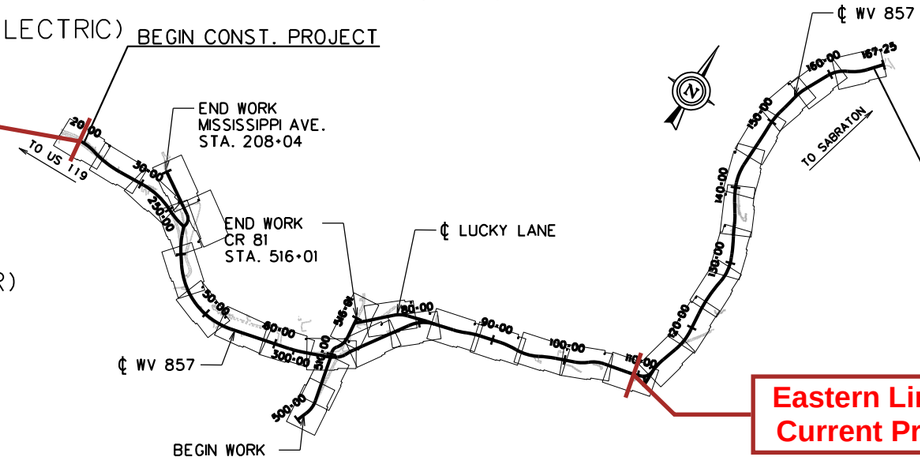
	Station		Station		f.t.		mile(s)
(BEGIN TO MISS. AVE.)	24+00	to	252+95.79	-	1,405	-	0.266
(MISS. AVE. TO CR 81)	252+95.79	to	304+93.28	-	3,013	-	0.571
(CR 81 TO LUCKEY LANE)	304+93.28	to	82+22.99	-	1,475	-	0.279
(LUCKEY LANE TO AARONS CREEK RD.)	82+22.99	to	110+94.89	-	2,872	-	0.544
(AARONS CREEK RD. TO END)	110+94.89	to	166+00	-	5,505	-	1.043
	Total Project Length				14,270		2.703



Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	1	272

UTILITIES ENCOUNTERED

FRONTIER WEST VIRGINIA INC. (TELEPHONE)
TRANS-ALLEGHENY INTERSTATE LINE COMPANY (ELECTRIC)
A.V. COMPANY INC. (GAS)
CARDINAL NATURAL GAS
NORTHERN DIVISION (GAS)
HOPE GAS INC. (GAS)
MONONGAHELA POWER COMPANY (ELECTRIC)
MOUNTAINEER GAS COMPANY (GAS)
DECKERS CREEK PUBLIC SERVICE DISTRICT (SEWER)
CLINTON WATER ASSOCIATION, INC. -
(WATER ASSOCIATIONS/AUTHORITIES)
MORGANTOWN UTILITY BOARD (MUB)
COMCAST COMMUNICATIONS LLC (CABLE)



TYPE OF CONSTRUCTION

ROADWAY WIDENING, GRADE, DRAINAGE, PAVEMENT, PAVEMENT MARKING, SIGNING & ROUNDABOUTS.

PFR SUBMITTAL
MARCH 29, 2019

NOTES: STANDARD DETAIL BOOK VOL. I DATED MAY 2016 & VOLUME II DATED JANUARY 2019, SHALL APPLY TO THIS PROJECT.

SCALES

PLAN HOR. 0 20 ft.
PROFILE VERT. 5 ft. 0
HOR. 0 20 ft.

DESIGN DESIGNATION

A.D.T. (2018 -)	11,127
A.D.T. (2048 -)	14,999
D.H.V.	783
D	54/46
T	4.4%
V	40 MPH

CONVENTIONAL SIGNS

- STATE LINE
- COUNTY LINE
- CORPORATION LINE
- PROPOSED R/W & EASEMENT LINE
- EXISTING R/W LINE
- PROPERTY LINE
- EXISTING FENCE
- PROPOSED FENCE
- EDGE OF STREAM
- PROPOSED GUARD RAIL
- EXISTING GUARD RAIL
- RAILROAD
- G GAS LINE
- W WATER LINE
- T TELEPHONE LINE
- E ELECTRIC LINE
- TELEPHONE POLE
- POWER POLE
- COMBINED POWER AND TELEPHONE POLE
- TREE
- SHRUB
- RIGHT OF WAY MARKER

INDEX TO SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2-6	TYPICAL SECTIONS
7-8	SUMMARY OF QUANTITIES
9	GENERAL NOTES
10-14	GEOMETRIC LAYOUT
15-16	MAINTENANCE OF TRAFFIC PLANS
17	REFERENCE POINTS
18-49	PLAN SHEETS
50-84	PROFILE SHEETS
85-89	OWNERSHIP INDEX
90-96	PROPERTY MAPS
97-101	SOIL AND GEOLOGIC INFORMATION PLANS
102-272	CROSS SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

..... 20.....
I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT.....

.....
EXECUTIVE SECRETARY

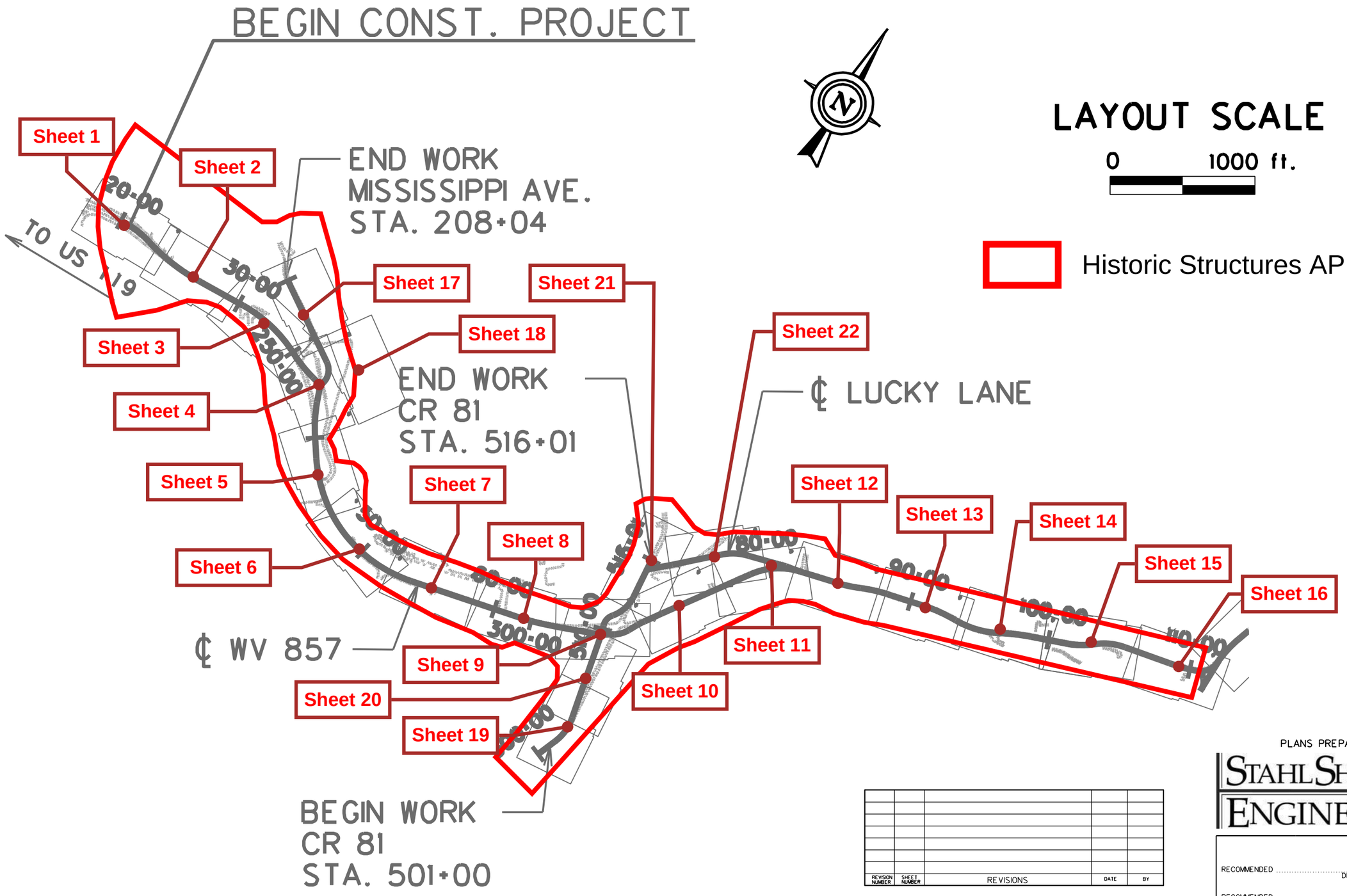
PLANS PREPARED BY:
STAHL SHEAFFER ENGINEERING

RECOMMENDED ..... DESIGNER
RECOMMENDED FOR APPROVAL ..... STATE HIGHWAY ENGINEER
APPROVED ..... COMMISSIONER OF HIGHWAYS

PROJECT NO. U331-857-0.67 00 / STP-0857 (019)D

J05C50C08-TITLE 1

$$$$$$$$$$FILENAME$$$$$$$$$$
DD-MM-YYYY HH:MM
$USERNAME$



LAYOUT SCALE

0 1000 ft.

Historic Structures APE

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

..... 20.....

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT.....

.....
EXECUTIVE SECRETARY

PLANS PREPARED BY:

STAHL SHEAFFER ENGINEERING

RECOMMENDED ..... DESIGNER

RECOMMENDED FOR APPROVAL ..... STATE HIGHWAY ENGINEER

APPROVED ..... COMMISSIONER OF HIGHWAYS

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	18	272

BEGIN CONST. PROJECT
STA. 20+66

WESTERN LIMIT OF CURRENT PROJECT

20+00

P.C. 20+00.00

857

21+00

CURVE #1

22+00

Greenbag Road

P.I. 21+21.67

P.T. 22+40.76

P.C. 22+40.77

23+00

MATCHLINE STA. 23+00

BEGIN TAPER
STA. 20+66

EX. R/W

CURVE #1

P.I. Sta. 21+21.67
D = 20° 22' 34" (RT)
Dc = 8° 27' 47"
R = 677.00'
T = 121.67'
L = 240.76'
SE = MATCH EXISTING

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 1 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:12 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	19	272

MATCHLINE STA. 23+50

END TAPER
STA. 23+57.50

EX. R/W

R/W

15" PIPE

2" PLASTIC GAS MAIN

8"PVC WATER MAIN
DRAWN PER RECORD

TYPE B INLET

24+00

25+00

CURVE #2

℄ WV 857

GREEN BAG ROAD
ASPH.

26+00

Greenbag Road

27+00

P.I. 26+89.95

28+00

29+00

N 87° 52' 16" E

MATCHLINE STA. 29+50

P.I. 24+65.78

TCE

GTS AND MARKER

1 2 3 4 5

CURVE #2

P.I. Sta. 24+65.78
D = 18° 19' 32" (LT)
Dc = 4° 06' 26"
R = 1,395.00'
T = 225.01'
L = 446.18'
SE = 4.8%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 2 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:13 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	20	272

SEE SHEET 44

MATCHLINE STA. 29+50

MATCHLINE STA. 35+00

Greenbag Road

EX. WETLAND

TR 1

TR 1

6-5

5

4

67

EX. R/W

R/W

15" PIPE

TYPE B INLET

TYPE A MH

24" PIPE

P.I. Sta. 30+36.32

8" CLAY

GREENBAG ROAD OUTFALL #3

GREENBAG ROAD OUTFALL #2

8" PVC

FM - 10" CIP

12'X 8' BOX EXTENSION

TCE

CURVE #3

P.I. Sta. 32+77.73
D = 28° 39' 39" (RT)
Dc = 6° 03' 47"
R = 945.00'
T = 241.41'
L = 472.71'
SE = 6.2%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 3 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:15 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	21	272

MATCHLINE (SEE SHEET 45)

TR 3

MATCHLINE STA. 203+20 (SEE SHEET 44)

R/W

15" PIPE

TYPE B INLET

TYPE A MANHOLE

℄ MISSISSIPPI AVE.

P.I. 201+08.15

MAINTENANCE ACCESS

12" PIPE

203+00

Mississippi Street

202+00

201+00

CURVE #6

P.I. 201+78.03

15" PIPE

TYPE B INLET

EX. CITY R/W

BL CONST. WV 857 ROUNDABOUT STA. 252+95.79
℄ MISSISSIPPI AVE. STA. 200+80

10' BERM 905

TYPE G INLET

18'

P.C. 200+00

D=118°

253+00

S 76° 04' 25" W

P.I. 252+20.01

6-3

Bottom AVG elev 900

P.I. 252+95.79

S 20° 38' 11" E

254+00

P.C. 254+14.10

15" PIPE

TYPE C INLET

TR 2

7

EX. CITY R/W

R/W

℄ CONST. WV 857 ROUNDABOUT

252+00

P.C. 250+00.00

15" PIPE

TYPE C INLET

251+00

CURVE #4

MATCHLINE STA. 35+00

00

Greenbag Road

P.I. 251+10.45

37+00

38+00

18'

38'

EX. R/W

255+00

Greenbag Road

CURVE #5

256

MATCHLINE STA. 256+00

P.I. 255+39.28

EX. R/W

R/W

TR 2

STA. ℄ WV 857 35+09.03 =
STA. BL CONST. WV 857 ROUNDABOUT
P.T. 250+00

6-5

EX. R/W

TR 6

EX. STREAM

12" CLAY

CURVE #4
P.I. Sta. 251+10.45
D = 12° 36' 20" (LT)
Dc = 5° 43' 46"
R = 1,000.00'
T = 110.45'
L = 220.01'
SE = N.C.

CURVE #5
P.I. Sta. 255+39.28
D = 14° 16' 16" (LT)
Dc = 5° 43' 46"
R = 1,000.00'

CURVE #6
P.I. Sta. 201+08.15
D = 82° 01' 20" (LT)
Dc = 46° 04' 22"
R = 124.36'
T = 108.15'
L = 178.03'
SE = N.C.

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 4 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:16 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	22	272

STA. ℄ WV 857 41+26.56 =
STA. BL CONST. WV 857 ROUNDABOUT
P.T. 256+63.17

MATCHLINE STA. 256+00

MATCHLINE STA. 46+50

Greenbag Road

℄ WV 857

EX. R/W

TR 1

6-4

6-5

9

7

15" PIPE

42+71.38 P.C.

TYPE B INLET 41+00

CURVE +5

S 34° 48' 27" E

42+00

TYPE B INLET 43+00

CURVE +7

44+00

TYPE B INLET 45+00

46+00

361 PIPE EXTENSION

EX. STREAM

EX. WETLAND

GATE

GRAVEL

WOODS/BRUSH

GREEN BAG ROAD ASPH.

ASPH.

PRIVATE SIGN

MORGANTOWN ICE ARENA

GLASS

SHED

8" PVC

MP-P #L4778 4513

MP-P #3898 3013

MP-P #L4777 4513

MP-P #65982 5513 10KVA

CURVE +5

P.I. Sta. 255+39.28
D = 14° 16' 16" (LT)
Dc = 5° 43' 46"
R = 1,000.00'
T = 125.19'
L = 249.08'
SE = 6.0%

CURVE +7

P.I. Sta. 49+13.66
D = 67° 50' 43" (LT)
Dc = 5° 59' 58"
R = 955.00'

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 5 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:17 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	23	272

MATCHLINE STA. 46+50

MATCHLINE STA. 52+50

Greenbag Road

TYPE B INLET 47+00

℄ WV 857

48+00

CURVE #7

49+00 TYPE B INLET

50+00

51+00

TYPE B INLET

52+00

P.I. 49+13.66

12" PIPE

15" PIPE

15" PIPE

15" PIPE

EX. R/W

EX. R/W

EX. R/W

EX. CITY R/W

EX. CITY R/W

R/W

8" PVC

10" CLAY

GRASS

GRAVEL

ASPH.

GREEN BAG ROAD

NO PARKING

CAUTION

STOP

PRIVATE SIGN

FEDERAL INSTITUTION

950'

940'

9

8

6-5

MG-2645 I
FCI Morgantown Kennedy Center

CURVE #7

P.I. Sta. 49+13.66
D = 67° 50' 43" (LT)
Dc = 5° 59' 58"
R = 955.00'
T = 642.28'
L = 1,130.84'
SE = 6.2%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 6 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:18 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	24	272

MATCHLINE STA. 52+50

MATCHLINE STA. 58+70

Greenbag Road

VIRGINIA CIRCLE

VIRGINIA CIRCLE

YIELD SIGN

6" PVC

8" PVC

10" CLAY

EX. R/W

R/W

℄ WV 857

N 77° 20' 51" E

TYPE B INLET

15" PIPE

P.I. 54+02.22

CURVE #7

GREEN BAG ROAD ASPH.

GRASS

E-POSTED

GATE

MP-P #283595 4015

MP-P #283576 4512

MP-P #L5979 4513 15KVA

MP-P #L5978 4513 10KVA

53+00

54+00

55+00

56+00

57+00

58+00

9

10-1

960'

940'

930'

CURVE #7

P.I. Sta. 49+13.66
D = 67° 50' 43" (LT)
Dc = 5° 59' 58"
R = 955.00'
T = 642.28'
L = 1,130.84'
SE = 6.2%

MG-2645 / FCI Morgantown Kennedy Center

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	25	272

MATCHLINE STA. 58+70

MATCHLINE STA. 302+00

℄ WV 857 STA. 60+65.26 =
℄ VIRGINIA CIR. STA. 300+00

STA. ℄ WV 857 62+78.74 =
STA. BL CONST. WV 857 ROUNDABOUT 300+00.00

℄ VIRGINIA CIR.

STORMWATER POND

Greenbag Road

℄WV 857 ROUNDABOUT

TR 1 TR 2 TR 3 TR 4

TYPE B INLET
TYPE C INLET
TYPE G INLET
TYPE B INLET
TYPE B INLET

15" PIPE
18" PIPE
12" PIPE
24" PIPE
90° PIPE EXTENSION

2' CLEARANCE AT CROSS PIPES

STREAM TO BYPASS POND

EX. WETLAND

TRENCH DRAIN

LANDSCAPE ROCK

BLUEGRASS

WOODS/BEEDS

GRAVEL

CURVE •8
P.I. Sta. 62+45.08
D = 3° 06' 13" (LT)
Dc = 4° 36' 34"
R = 1,243.00'
T = 33.67'
L = 67.33'
SE = N.C.

CURVE •9
P.I. Sta. 301+13.07
D = 5° 09' 31" (LT)
Dc = 2° 16' 58"
R = 2,510.00'
T = 113.07'
L = 225.99'
SE = N.C.

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:20 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	26	272

CURVE #11
P.I. Sta. 510+78.12
D = 56° 14' 01" (RT)
Dc = 57° 17' 45"
R = 100.00'
T = 53.43'
L = 98.15'
SE = N.C.

CURVE #12
P.I. Sta. 512+25.07
D = 44° 29' 07" (LT)
Dc = 22° 55' 06"
R = 250.00'
T = 102.24'
L = 194.10'
SE = R.C.

CURVE #13
P.I. Sta. 307+88.14
D = 5° 51' 52" (RT)
Dc = 11° 27' 33"
R = 500.00'
T = 25.61'
L = 51.18'
SE = N.C.

CURVE #9
P.I. Sta. 301+13.07
D = 5° 09' 31" (LT)
Dc = 2° 16' 58"
R = 2,510.00'
T = 113.07'
L = 225.99'
SE = N.C.

CURVE #10
P.I. Sta. 306+37.65
D = 28° 51' 38" (LT)
Dc = 28° 38' 52"
R = 200.00'
T = 51.46'
L = 100.74'
SE = N.C.

MATCHLINE STA. 302+00

MATCHLINE STA. 308+00 (SEE SHEET 48)

MATCHLINE STA. 508+00 (SEE SHEET 47)

Greenbag Road

Dorsey Avenue

Kingwood Pike

@WV 857 ROUNDABOUT

@CR 81 ROUNDABOUT

TYPE A MANHOLE

TYPE B INLET

TYPE C INLET

TYPE G INLET

18" PIPE

15" PIPE

EX. R/W

EX. RETAINING WALL

SCALE : 0 20 ft. 40 ft.

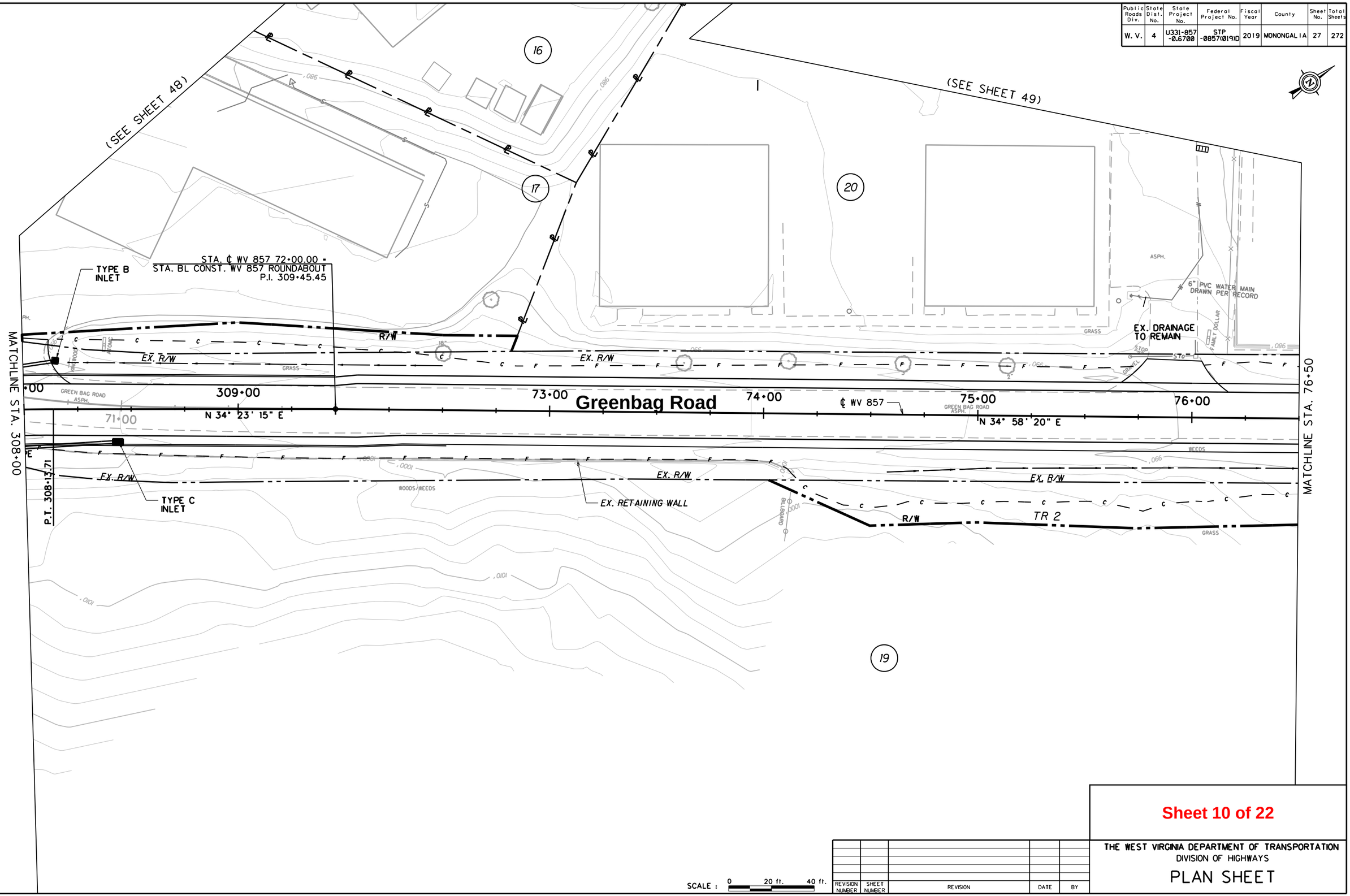
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:33 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	27	272



SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:35 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	28	272

CURVE #15D
P.I. Sta. 500+60.74
D = 9° 34' 15" (LT)
Dc = 7° 53' 49"
R = 725.55'
T = 60.74'
L = 121.20'
SE = N.C.

MATCHLINE STA. 503+50 (SEE SHEET 49)

Luckey Lane
S 76° 15' 52" W
S 74° 26' 27" W

P.I. 502+21.20
P.I. 80+53.91
P.I. 500+60.74
P.C. 78+39.10
P.C. 500+00

EX. R/W
TCE
R/W
℄ LUCKEY LANE
℄ WV 857
CURVE #14
CURVE #15D
15" PIPE
STORM WATER DETENTION POND
STORM WATER POND
GREEN BAG ROAD ASPH.
LUCKEY LANE ASPH.
GRASS
TR 2

Greenbag Road
GREENBAG ROAD

77+00
78+00
79+00
80+00
81+00
82+00
500+00
502+00
501+00

MATCHLINE STA. 76+50
MATCHLINE STA. 82+00

20
19

CURVE #14
P.I. Sta. 80+53.91
D = 41° 19' 45" (RT)
Dc = 11° 41' 35"
R = 490.00'
T = 184.81'
L = 353.45'
SE = 8.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:36 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	29	272

MATCHLINE STA. 82+00

MATCHLINE STA. 88+00

601+65

601+00 ℄ RICHARD AVE.

EX. R/W

EX. R/W

8" PVC

GAS MAIN SIZE & TYPE UNKNOWN

8" AC WATER MAIN DRAWN PER RECORD

NO PARKING THIS SIDE

NO PARKING THIS SIDE

RICHARD AVENUE

ASPH.

1 STORY BRICK

21

SEPTIC TANK

OLD WATER WELL

GRASS

2 STORY VINYL

ABANDONED SEPTIC

22

2 STORY BRICK/ VINYL

25

P.C. 84+08.87

P.R.C. 86+54.44

P.I. 87+49.21

2" STEEL GAS MAIN

8" AC WATER MAIN DRAWN PER RECORD

TCE

TCE

2" STEEL GAS MAIN

GRAVEL

EX. R/W

EX. R/W

R/W

R/W

R/W

R/W

18" PIPE

18" PIPE

15" PIPE

15" PIPE

16" PIPE EXTENSION

600+00

83+00

84+00

85+00

86+00

87+00

88+00

CURVE #16

CURVE #17

℄ WV 857

Greenbag Road

N 76° 18' 05" E

GREEN BAG ROAD ASPH.

500+00

WEEDS

EX. R/W

EX. R/W

EX. R/W

TR 2

GRASS

R/W

R/W

R/W

R/W

R/W

R/W

P.I. 85+66.88

P.T. 82+22.56

℄ WV 857 STA. 82+38.81 = ℄ RICHARD AVE. STA. 600+00

℄ WV 857 STA. 82+22.99 = ℄ LUCKEY LANE STA. 500+00

19

19-A

23

24

700 GAL. STORM WATER HOLDING TANK

1 STORY WOOD

2 STORY VINYL

LANDSCAPE

CONC.

DRAIN FIELD SEPTIC ACTIVE

CURVE #16
P.I. Sta. 85+66.88
D = 10° 06' 36" (LT)
Dc = 5° 45' 30"
R = 995.00'
T = 88.01'
L = 175.57'
SE = 6.0%

CURVE #17
P.I. Sta. 87+49.21
D = 10° 38' 51" (RT)
Dc = 5° 38' 02"
R = 1,017.00'
T = 94.77'
L = 188.99'
SE = 6.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	30	272

Jonathan Lane

Greenbag Road

℄ JONATHAN LANE

℄ WV 857 STA. 88+30.82 = ℄ JONATHAN LANE STA. 700+00

MATCHLINE STA. 88+00

℄ WV 857 STA. 93+34.71 = ℄ ASHWORTH LANE STA. 800+00

℄ ASHWORTH LANE

MATCHLINE STA. 94+00

℄ WV 857

N 76° 50' 19" E

CURVE #18

CURVE #19

P.I. 92+35.35

P.C. 91+18.85

P.T. 88+32.43

P.R.C. 93+50.86

CURVE #18	CURVE #19
P.I. Sta. 92+35.35	P.I. Sta. 95+11.65
D = 12° 59' 41" (RT)	D = 29° 01' 58" (LT)
Dc = 5° 36' 03"	Dc = 9° 13' 35"
R = 1,023.00'	R = 621.00'
T = 116.51'	T = 160.79'
L = 232.01'	L = 314.67'
SE = 6.0%	SE = 7.6%

SCALE : 0 20 ft. 40 ft.

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

4/1/2019
9:23:39 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	31	272

℄ WV 857 STA. 94+05.28 =
℄ GLEN OAKS DRIVE STA. 900+00

MATCHLINE STA. 94+00

MATCHLINE STA. 100+00

Greenbag Road

℄ GLEN OAKS DRIVE 900+98

℄ WV 857

P.I. 96+65.55

P.I. 97+77.14

P.I. 95+11.65

P.I. 98+88.30

TR 1

TR 2

TCE

EX. R/W

R/W

CURVE #19
P.I. Sta. 95+11.65
D = 29° 01' 58" (LT)
Dc = 9° 13' 35"
R = 621.00'
T = 160.79'
L = 314.67'
SE = 7.6%

CURVE #20
P.I. Sta. 97+77.14
D = 8° 58' 56" (RT)
Dc = 4° 01' 55"
R = 1,421.00'
T = 111.61'
L =
SE

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	32	272

MG-2641 / Campbell Farmhouse

Greenbag Road

MATCHLINE STA. 100+00

MATCHLINE STA. 106+20

P.I. 104+40.07

P.I. 105+44.70

P.I. 102+41.48

P.R.C. 103+30.99

P.C.I. 101+50.25

¢ WV 857

CURVE #21

CURVE #22

EXISTING 36"/42" PIPE TO REMAIN

EX. PIPE TO REMAIN

36" PIPE EXTENSION

36" PIPE

TYPE C INLET

TYPE G INLET

15" PIPE

4" PLASTIC GAS MAIN DRAWN PER RECORD

2" PLASTIC GAS MAIN

8" PVC WATER MAIN DRAWN PER RECORD

8" PVC WATER MAIN

3 GAS VALVES AND CONC PAD

GAS VALVE AND MARKER

GTS AND MARKER

EX. R/W

R/W

EX. TO REMAIN

TR 1

TR 3

TCE

ICE

GREEN BAG ROAD ASPH.

GRAVEL

WOODS/REEDS

930'

920'

910'

36

37

35

MP-P #N7269 5013

MP-P #N7268 3015

MP-P #N7267 5013

MP-P #N7270 4015

MP-P #N7266 3015

CURVE #21	CURVE #22
P.I. Sta. 102+41.48	P.I. Sta. 104+40.07
D = 19° 12' 46" (LT)	D = 28° 16' 44" (RT)
Dc = 10° 37' 48"	Dc = 13° 13' 56"
R = 539.00'	R = 433.00'
T = 91.23'	T = 109.08'
L = 180.74'	L = 213.71'
SE = 4.6%	SE = 5.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	33	272

EASTERN LIMIT OF CURRENT PROJECT

MATCHLINE STA. 106+20

MATCHLINE STA. 112+00

Greenbag Road

MG-2641 / Campbell Farmhouse

TYPE B INLET

15" PIPE

8" PVC WATER MAIN DRAWN PER RECORD

2" PLASTIC GAS MAIN DRAWN PER RECORD

2" PLASTIC GAS MAIN

12" PVC

AARON CREEK

GIBSON BALL

P.C. 108+65.55

P.C.C. 110+65.85

107+00 108+00 109+00 110+00 111+00 112

1100+00 1101+00 1102+00

℄ WV 857

CURVE #23

CURVE #24

P.I. 109+64.93

P.I. 111+51.77

℄ WV 857 110+94.89 - ℄ AARONS CREED RD. 1100+00

P.T. 1100+50.73

P.T. 1101+25.75

POE 1102+48.20

END WORK STA. 1102+48.20

℄ AARONS CREEK RD.

EX. R/W

TR 2

GREEN BAG ROAD

GRAVEL

ASPH.

GRASS

WOODS/WEEDS

THE SUBE SHOP

MP-P #138505C109H3 25KVA

MP-P #2702 4513

MP-P #C6198 4015 3-25KVA

38 39 40 35 68

CURVE #23
P.I. Sta. 109+64.93
D = 9° 31' 54" (LT)
Dc = 4° 48' 24"
R = 1,192.00'
T = 99.38'
L = 198.30'
SE = 5.4%

CURVE #24
P.I. Sta. 111+51.77
D = 66° 08' 48" (LT)
Dc = 42° 26' 29"
R = 135.00'
T = 87.92'
L = 155.85'
SE = 8.0%

SCALE : 0 20 ft. 40 ft.

Sheet 16 of 22

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:41 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	44	272

END WORK
STA. 208+04.26

P.T. 208+04.26

MISSISSIPPI AVE.

Mississippi Street

N 56° 32' 44" W

208+00 207+00 206+00 205+00 204+00

EX. R/W

R/W

8" STEEL

8" CLAY

TYPE G INLET

PIPE

TR 2

EX. CITY R/W

MATCHLINE STA. 203+20 (SEE SHEET 21)

6-2

(SEE SHEET 20)

SCALE : 0 20 ft. 40 ft.

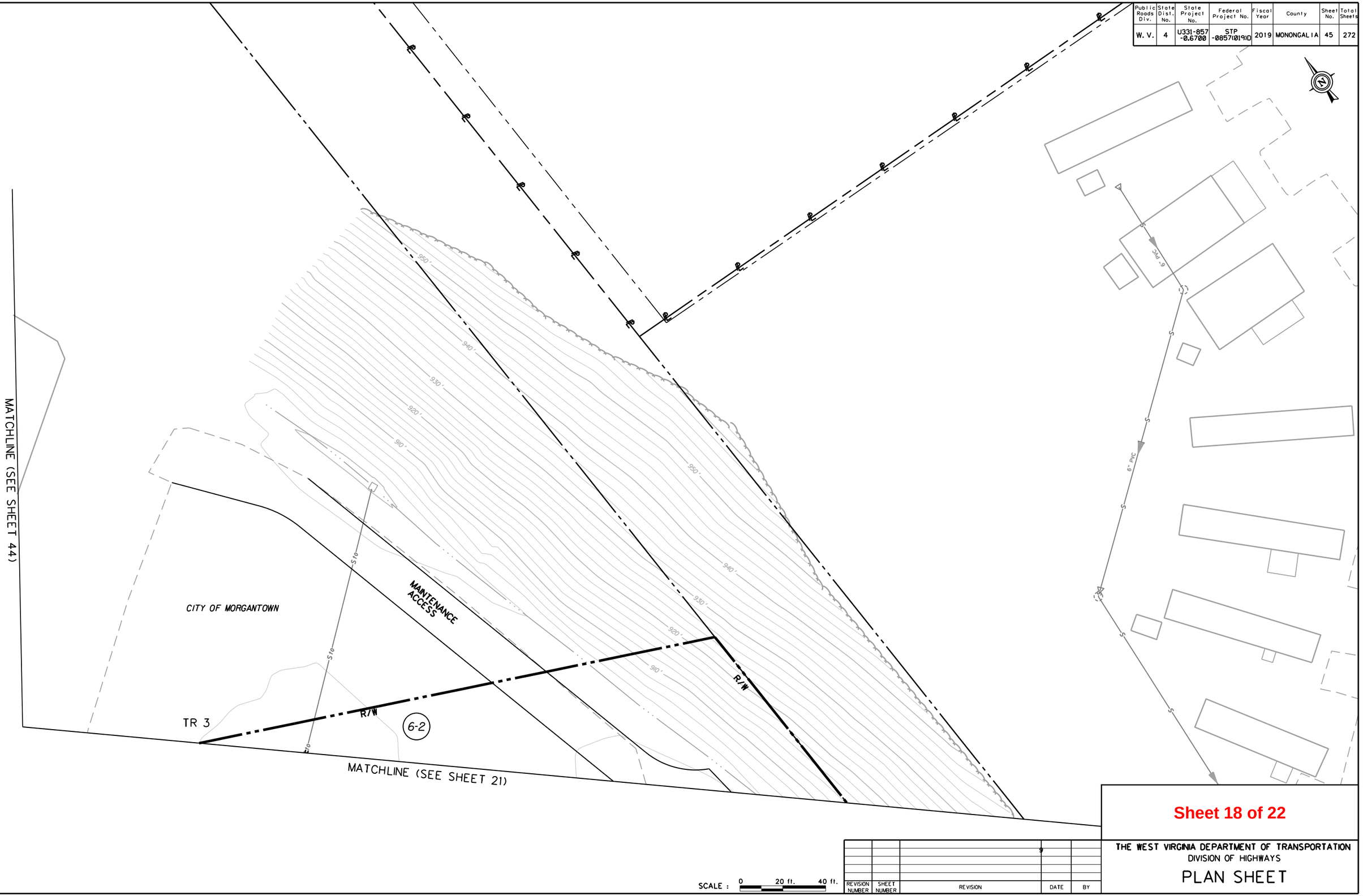
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:50 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	45	272



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SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:51 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	46	272



CURVE #11A
P.I. Sta. 502+49.65
D = 34° 29' 35" (LT)
Dc = 16° 22' 13"
R = 350.00'
T = 108.65'
L = 210.71'
SE = MATCH EXISTING

SCALE : 0 20 ft. 40 ft.

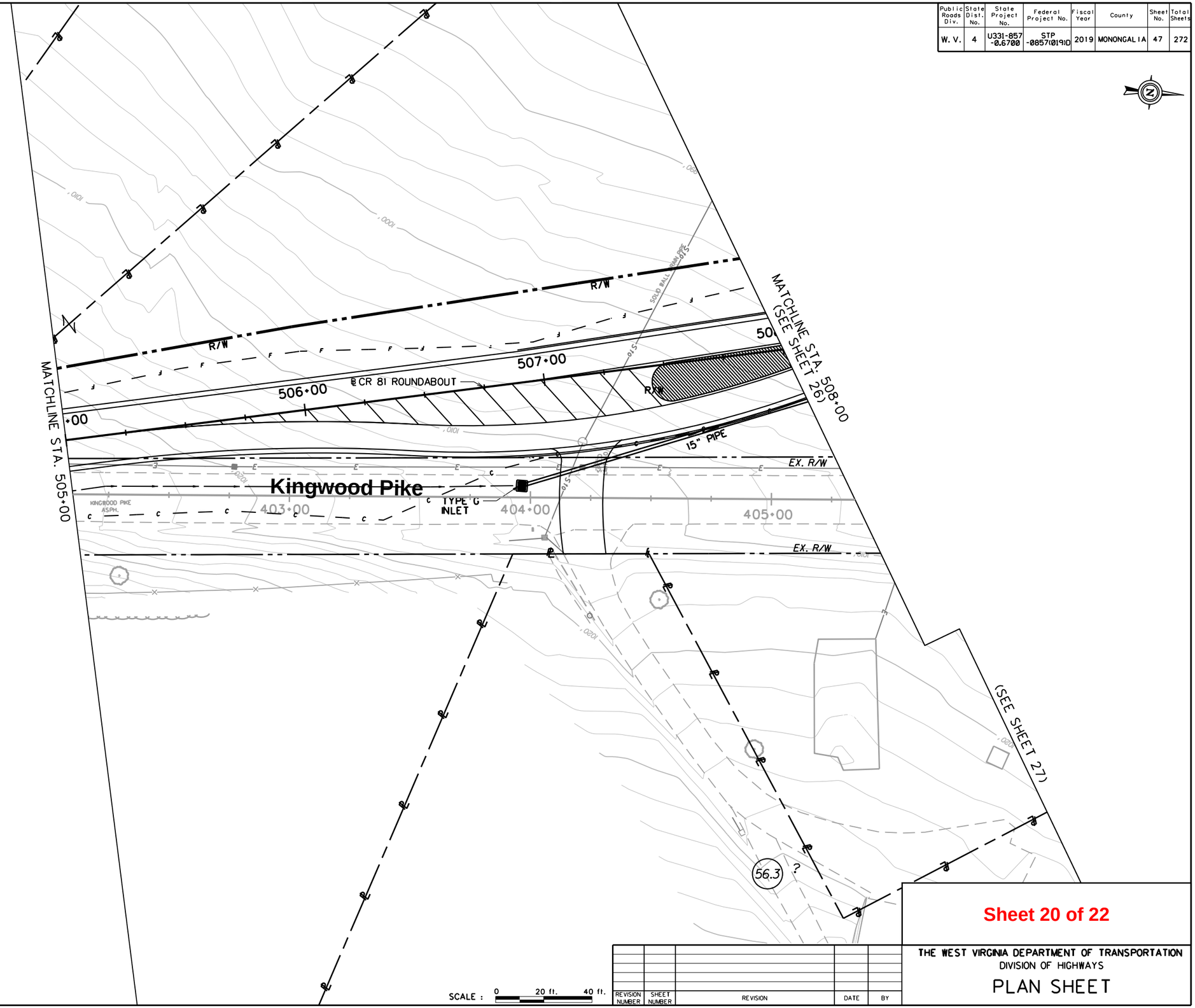
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:52 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	47	272



SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:53 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	48	272

MATCHLINE STA. 512+50
(SEE SHEET 26)

Dorsey Avenue

Parkway Drive

Luckey Lane

℄ CR 81 STA. 515+29.85
℄ LUCKEY LANE STA. 510+36

℄ LUCKEY LANE

END WORK
STA. 516+01

TYPE B INLET

TYPE B INLET

TYPE B INLET

TYPE B INLET

TYPE B INLET

TYPE B INLET

P.T. 513+16.93

TR 1

TR 2

TCE

TCE

TCE

EX. R/W

EX. R/W

EX. R/W

EX. R/W

EX. R/W

R/W

R/W

R/W

R/W

R/W

8" AC WATER MAIN
BY METER RECORD

8" STEEL GAS MAIN

8" PVC

8" PVC

8" CLAY

10" CLAY

8" CLAY

6" CLAY

24" CMP

24" CMP

18" CLAY

6" PVC

6" TRU

6" TRU

15" PIPE

15" PIPE

15" PIPE

15" PIPE

18" PIPE

CURVE •12

P.I. Sta. 512+25.07
D = 44° 29' 07" (LT)
Dc = 22° 55' 06"
R = 250.00'
T = 102.24'
L = 194.10'
SE = R.C.

P.I. 508+89.05

MATCHLINE STA 509+00
(SEE SHEET 49)

(SEE SHEET 27)

513+00

514+00

515+00

516+01

509+00

510+00

411+00

412+00

413+00

414+00

415+00

11

11-2

14

15

16

PRIVATE SIGN

DORSEY AVENUE
ASPH.

DORSEY AVENUE
LUCKEY LANE

LUCKEY LANE
ASPH.

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

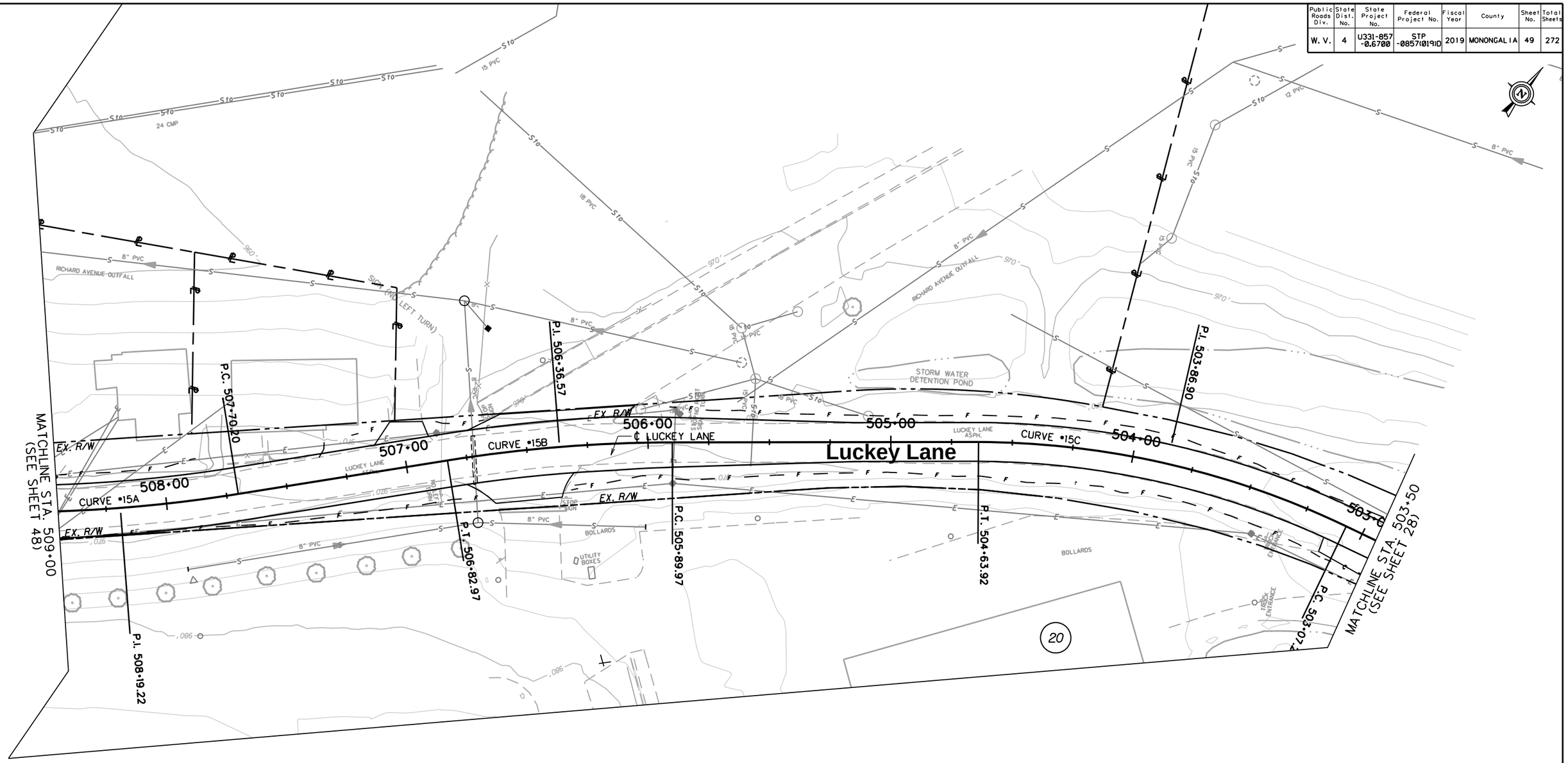
Sheet 21 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:54 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	49	272



CURVE •15A
P.I. Sta. 508+19.22
D = 9° 26' 50" (RT)
Dc = 9° 39' 33"
R = 593.17'
T = 49.01'
L = 97.81'
SE = 4.6%

CURVE •15B
P.I. Sta. 506+36.57
D = 9° 01' 47" (LT)
Dc = 9° 42' 34"
R = 590.11'
T = 46.60'
L = 93.00'
SE = 4.6%

CURVE •15C
P.I. Sta. 503+86.90
D = 25° 18' 45" (LT)
Dc = 16° 09' 36"
R = 354.55'
T = 79.62'
L = 156.64'
SE = 6.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 22 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:55 AM

APPENDIX C
PHOTOGRAPHS



Photograph 1. MG-1332 / Harner Chapel, Morgantown, Monongalia County
Northeast elevation, facing northwest



Photograph 2. MG-2640 / House at 796 Greenbag Road, Morgantown, Monongalia County
East (side) elevation, facing west



Photograph 3. MG-2641 / Campbell Farmhouse, Morgantown, Monongalia County
North and west (front) elevations, facing southeast



Photograph 4. MG-2641 / Campbell Farmhouse, Morgantown, Monongalia County
Secondary dwelling (left) and dairy barn with silos behind, facing northeast



Photograph 5. MG-2642 / House at 851 Greenbag Road, Morgantown, Monongalia County
West and south (front) elevations, facing northeast



Photograph 6. MG-2643 / Mountaineer Mall, Morgantown, Monongalia County
Overview, facing southwest



Photograph 7. MG-2643 / Mountaineer Mall, Morgantown, Monongalia County
Representative entrance, facing southwest



Photograph 8. MG-2643 / Mountaineer Mall, Morgantown, Monongalia County
Mall entrance in ca. 1987 addition, facing southeast



Photograph 9. MG-2644 / Morgantown City Garage, Morgantown, Monongalia County
Southwest and southeast elevations, facing north



Photograph 10. MG-2644 / Morgantown City Garage, Morgantown, Monongalia County
Prefabricated outbuilding, facing southeast



Photograph 11. MG-2644 / Morgantown City Garage, Morgantown, Monongalia County
Non-historic storage barn, facing southeast



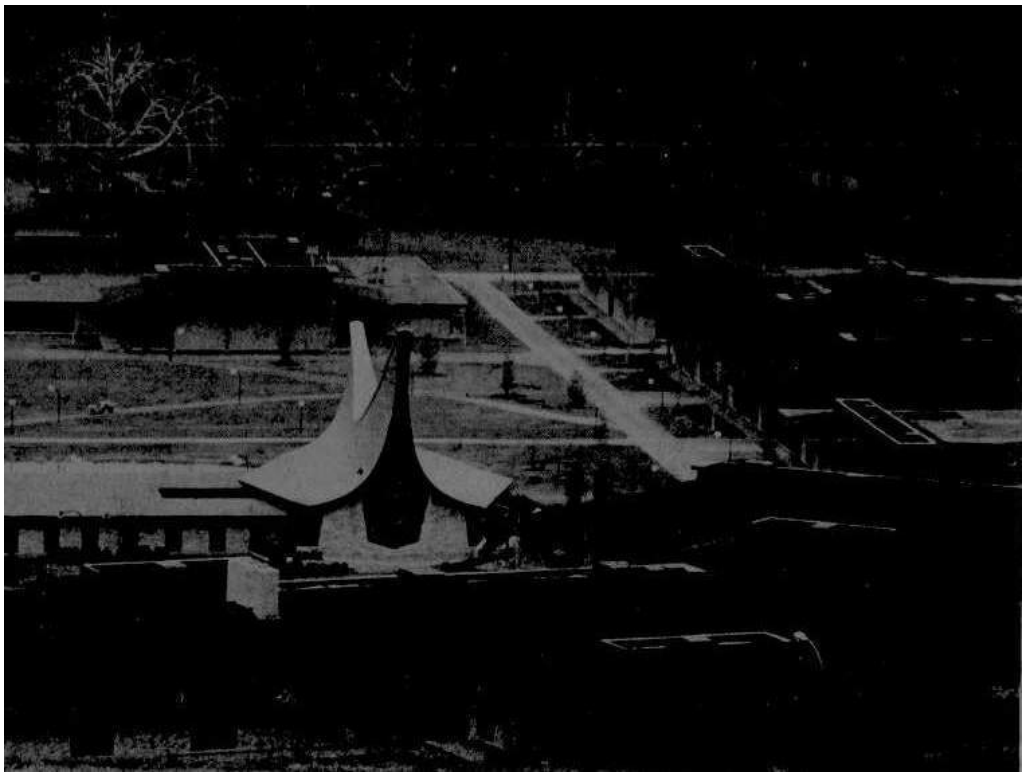
Photograph 12. MG-2645/FCI Morgantown Kennedy Center/R.F.K. Youth Center, Morgantown, Monongalia County
Entrance sign and wood post fencing south of Greenbag Road, facing southeast



Photograph 13. MG-2645/FCI Morgantown Kennedy Center/R.F.K. Youth Center, Morgantown, Monongalia County
Overview from Greenbag Road, facing southeast



Photograph 14. MG-2645 / FCI Morgantown Kennedy Center/R.F.K. Youth Center, Morgantown, Monongalia County
Representative building, facing west



Photograph 15. MG-2645 / FCI Morgantown Kennedy Center/R.F.K. Youth Center, Morgantown, Monongalia County
Photograph of representative building with hyperbolic-type roof (Morgantown Dominion News 1968)



Photograph 16. MG-2646 / Patton Farm, Morgantown, Monongalia County
Farmhouse, facing northeast



Photograph 17. MG-2646 / Patton Farm, Morgantown, Monongalia County
Root cellar, facing east



Photograph 18. MG-2646 / Patton Farm, Morgantown, Monongalia County
Shed #1 (foreground) and Shed #2 (background), facing east



Photograph 19. MG-2646 / Patton Farm, Morgantown, Monongalia County
Non-historic pole barn, facing northeast



Photograph 20. MG-2647 / Anderson House, Morgantown, Monongalia County
Overview showing house and non-historic garage, facing northeast



Photograph 21. MG-2647 / Anderson House, Morgantown, Monongalia County
House showing enclosed front porch, facing southeast



Photograph 22. MG-2648 / House at 1440 Dorsey Avenue, Morgantown, Monongalia County
House, non-historic garage, and larger non-historic garage in background, facing west



Photograph 23. MG-2649 / Smith House, Morgantown, Monongalia County
East and south elevations, facing northwest



Photograph 24. MG-2650 / Atomic Grill, Morgantown, Monongalia County
Main entrance, facing northeast



Photograph 25. MG-2650 / Atomic Grill, Morgantown, Monongalia County
Garage bays, facing north



Photograph 26. MG-2651 / Dorsey School, Morgantown, Monongalia County
Façade and south elevation, facing northeast



Photograph 27. MG-2651 / Dorsey School, Morgantown, Monongalia County
Rear addition, facing southwest



Photograph 28. MG-2652 / House at 1432 Dorsey Avenue, Morgantown, Monongalia County
House and garage, facing northwest



Photograph 29. MG-2653 / House at 102 Luckey Lane, Morgantown, Monongalia County
House with second story enclosed addition, facing northeast



Photograph 30. MG-2654 / House at 104 Luckey Lane, Morgantown, Monongalia County
Façade and southwest elevation, facing northeast



Photograph 31. MG-2655 / Mountain View Manor, Morgantown, Monongalia County
Overview of buildings, facing west



Photograph 32. MG-2656 / House at 500 Parkway Drive, Morgantown, Monongalia County
House and garage, facing north



Photograph 33. MG-2657 / House at 502 Parkway Drive, Morgantown, Monongalia County
Garage and ell, facing northwest



Photograph 34. MG-2658 / House at 693 Greenbag Road, Morgantown, Monongalia County
House with integral garage, facing northwest



Photograph 35. MG-2658 / House at 693 Greenbag Road, Morgantown, Monongalia County
Garage north of house, facing north



Photograph 36. MG-2659 / House at 703 Greenbag Road, Morgantown, Monongalia County
House with front and rear addition, facing northwest



Photograph 37. MG-2659 / House at 703 Greenbag Road, Morgantown, Monongalia County
Garage north of house, facing north



Photograph 38. MG-2660 / House at 710 Greenbag Road, Morgantown, Monongalia County
House showing rear addition and attached garage, facing southeast



Photograph 39. MG-2661 / Cobun Creek Culvert, Morgantown, Monongalia County
From flood plain south of Greenbag Road, facing north



Photograph 40. MG-2665 / The Sube Shop, Morgantown, Monongalia County
North (front) and west elevations, facing southeast



Photograph 41. MG-2666 / Aaron Creek Box Culvert, Morgantown, Monongalia County
South elevation of structure, facing northeast (WVDOH 2018)

APPENDIX D

HISTORICAL PRE-SCREENING CHECKLIST

West Virginia Division of Highways
Historical Pre-Screening Checklist

Project Name: Greenbag Road Improvement

[State Project: U331-857-0.67 00] [Federal Project: STP-0857(019)D]

County/Rt/Milepost: Monongalia / CR 857 / 0.50 to 1.75

Unit Leader: Sondra L. Mullins

Historian Name: Laura C. Ricketts and Elizabeth H. Williams / The Markosky Engineering Group, Inc.

Date: October 31, 2019

Project Information:

☐ Bridge Replacement

Was the bridge evaluated in the Historic Bridge Survey? Yes or No
Summarize response:

☐ Bank Stabilization/Slide Repair

☒ Intersection Improvement

☒ Road Widening/Realignment

☐ Other

☒ Culvert Replacement

The box culvert carrying Greenbag Road over Cobun Creek will be replaced by a wider box culvert.

☐ Grant Project Scope of Work:

Sources:

☐ Historic Maps

☒ County Histories

☒ Turnpike Maps

☒ SHPO Survey

☒ Newspapers

☒ National Register Listings

☒ Historic Bridge Survey Historic Context

☒ Historic Bridge Survey - Do Not Survey List

☒ Other (list): Deed research at the Monongalia County Clerk's Office

Project Area Information:

Where is the bridge project located?

The 1.65-mile long roadway improvement project is located along Greenbag Road (CR 857) beginning 0.40 miles east of the intersection of Greenbag Road and US 119 and ending where Greenbag Road crosses Aaron Creek.

What are the nearest towns or county seats? (Distance to them?)

The city of Morgantown is approximately 1.63 miles northwest of the Project.

What body of water does the bridge cross?

Greenbag Road crosses Cobun Creek with the MG-2661 Cobun Creek Culvert, and MG-2666 Bridge over Aaron Creek (Structure No. 31A203) carries Greenbag Road over Aaron Creek.

What transportation link does this bridge or location serve?

The Project provides access from Route 119 southwest of Morgantown to Sabraton which is located east of Morgantown.

Was this area used for?

☒ Agriculture
☐ Timber Industry
☒ Oil and Gas Industry
☐ Other

Are there previously surveyed resources in the area of potential effect? **Yes** or No
If yes, list the resources.

MG-1332 Harner Chapel

Are there resources greater than 50 years old with the APE? **Yes** or No
If yes, attach the Historic Property Inventory Forms.

The attached Historic Structures Survey and Determination of Eligibility Report includes HPI forms for the 24 historic structures newly surveyed within the APE. An updated form for the previously surveyed MG-1332 Harner Chapel at 100 Luckey Lane is also included.

MG-2640	House at 796 Greenbag Road
MG-2641	Bunner Home Farm **revised to Campbell Farmhouse 11-26-2019**
MG-2642	House at 851 Greenbag Road
MG-2643	Mountaineer Mall, 5000 Greenbag Road
MG-2644	Morgantown City Garage, 2020 Mississippi Street
MG-2645	FCI Morgantown Kennedy Center, 446 Greenbag Road

MG-2646	Farm, 87 Kingwood Pike
MG-2647	House, 27 Kingwood Pike
MG-2648	House, 1440 Dorsey Avenue
MG-2649	House, 1436 Dorsey Avenue
MG-2650	Atomic Grill Restaurant, 1451 Dorsey Avenue
MG-2651	Dorsey School, 1433 Dorsey Avenue
MG-2652	House, 1432 Dorsey Avenue
MG-2653	House, 102 Luckey Lane
MG-2654	House, 104 Luckey Lane
MG-2655	Mountain View Manor Apartments, 1201 – 7304 Mountain View Manor
MG-2656	House, 500 Parkway Drive
MG-2657	House, 502 Parkway Drive
MG-2658	House, 693 Greenbag Road
MG-2659	House, 703 Greenbag Road
MG-2660	House, 710 Greenbag Road
MG-2661	Cobun Creek Culvert
MG-2665	The Sube Shop
MG-2666	Bridge over Aaron Creek **revised to Aaron Creek Box Culvert 11-26-2019**

Historic District: N/A

Name of city/town/community:

Number of other structures in the viewshed: None 1-5 5-20 20-50 50+

General era of construction of surrounding structures: 1880 - 1975

Potential Historic District? Yes No
If yes, please summarize your evaluation.

☐ Criteria A

☐ Criteria B

☐ Criteria C

☐ Criteria D

Does the project propose to take a contributing resource? Yes No
If yes, proceed with report to the SHPO.

Historical Groups: (List contact and attach correspondence)

☒ Historic Landmarks Commission: Monongalia Co HLC; Morgantown HLC

☒ Preservation Alliance of West Virginia

☒ Historical Society: Monongalia Historical Society

☐ Local Genealogy Group

☐ Other Groups

Notes: WVDOH initiated consultation with local organizations concerning the Project beginning on January 30, 2019. Initial correspondence was sent to the Monongalia County Historic Landmarks Commission (MCHLC); the Morgantown Historic Landmarks Commission (MHLC); the Preservation Alliance of West Virginia (PAWV); and the Monongalia Historical Society (MHS). Follow-up emails were sent to the MCHLC, MHLC, and MHS on February 11, 2019. MCHLC responded via email on February 11, 2019 and indicated that the WVDOH correspondence had been shared with all MCHLC members and would be discussed at the next meeting on February 21, 2019. On February 25, 2019 MCHLC sent an email indicating that there were no comments related to the Project at the February 21 meeting. MHLC responded via email on February 13, 2019 and indicated that it had no comments as the Project is located outside of the city of Morgantown and therefore outside of the jurisdiction of the organization.

Review Exempt under Programmatic Agreement Appendix A

☐ Yes ☒ No

Provide Justification as to yes or no:

The Project area includes 25 properties that are over 45 yrs old and require evaluation for NRHP eligibility. See the Greenbag Road Improvement Project Historic Structures Survey and Determination of Eligibility Report (October 31, 2019) for further information.

Attach SHPO Survey website printout, photographs of project area and Historic Property Inventory Forms.

Signature: _____ (Sondra L. Mullins, Unit Leader)

Signature: _____ (Historian Name)

APPENDIX E

CORRESPONDENCE

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

January 30, 2019

Ms. Danielle Parker, Executive Director
Preservation Alliance of West Virginia
421 Davis Ave, #4
Elkins, WV 26241

Dear Ms. Parker:

State Project U331-857-0.67
Federal Project STP-0857(019)D
Greenbag Road Improvements
Monongalia County

The West Virginia Division of Highways (WVDOH) is developing the subject project at the location shown on the attached maps. The work will take place mainly on Greenbag Road – aka County Route 857 (CO 857) - in the Morgantown area in Monongalia County. The west terminus of the project is about 0.40 miles east of the Greenbag Rd-US 119 intersection and the east terminus is at Jonathan Lane about 0.36 miles east of the Greenbag Rd-Kingwood Pike/Dorsey Ave intersection. Associated project work is proposed on Mississippi Ave, Dorsey Ave, Luckey Lane, and Kingwood Pike. Proposed work includes: lane & shoulder widening; intersection improvements, including turn lanes; sidewalk installation along the north side of Greenbag Rd; installation of a roundabout at the Mississippi Ave intersection; and drainage improvements. During construction traffic will be maintained using single-lane closures as needed.

We are asking your organization for any comments you may have related to the proposed project and/or historical information you may have associated with the development of roads and surrounding properties dating to 1975 and earlier. Properties of interest include: older residences/farms, later housing and commercial development: and the federal correctional facility.

Should you have comments or require additional information, please contact Tracy Bakic of our Environmental Section at (304) 558-9676 or tracy.d.bakic@wv.gov.

Very truly yours,

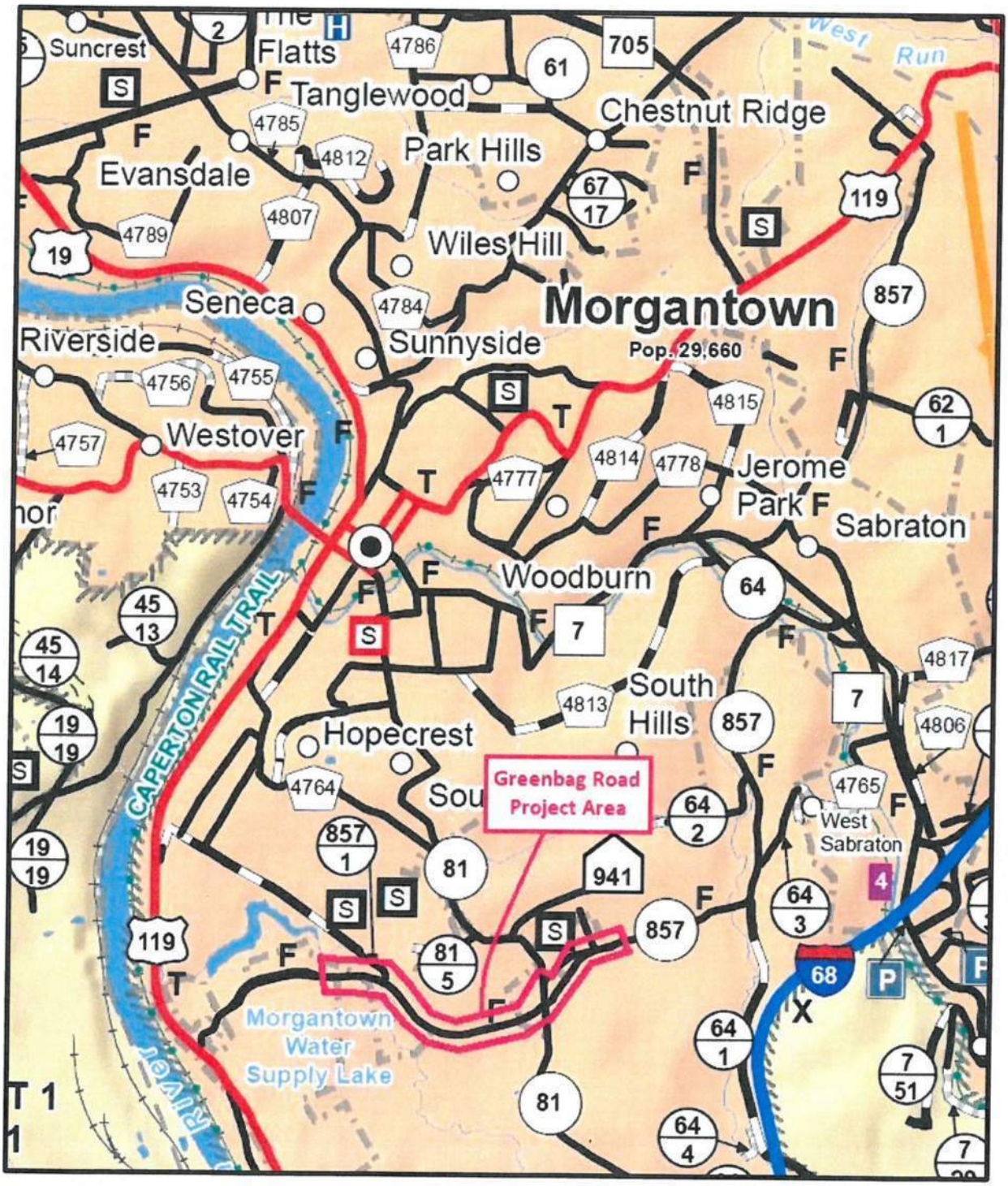
Ben L. Hark

Ben L. Hark
Environmental Section Head
Engineering Division

BH:s
Attachments
bcc: DDE(TDB)

LOCATION MAP

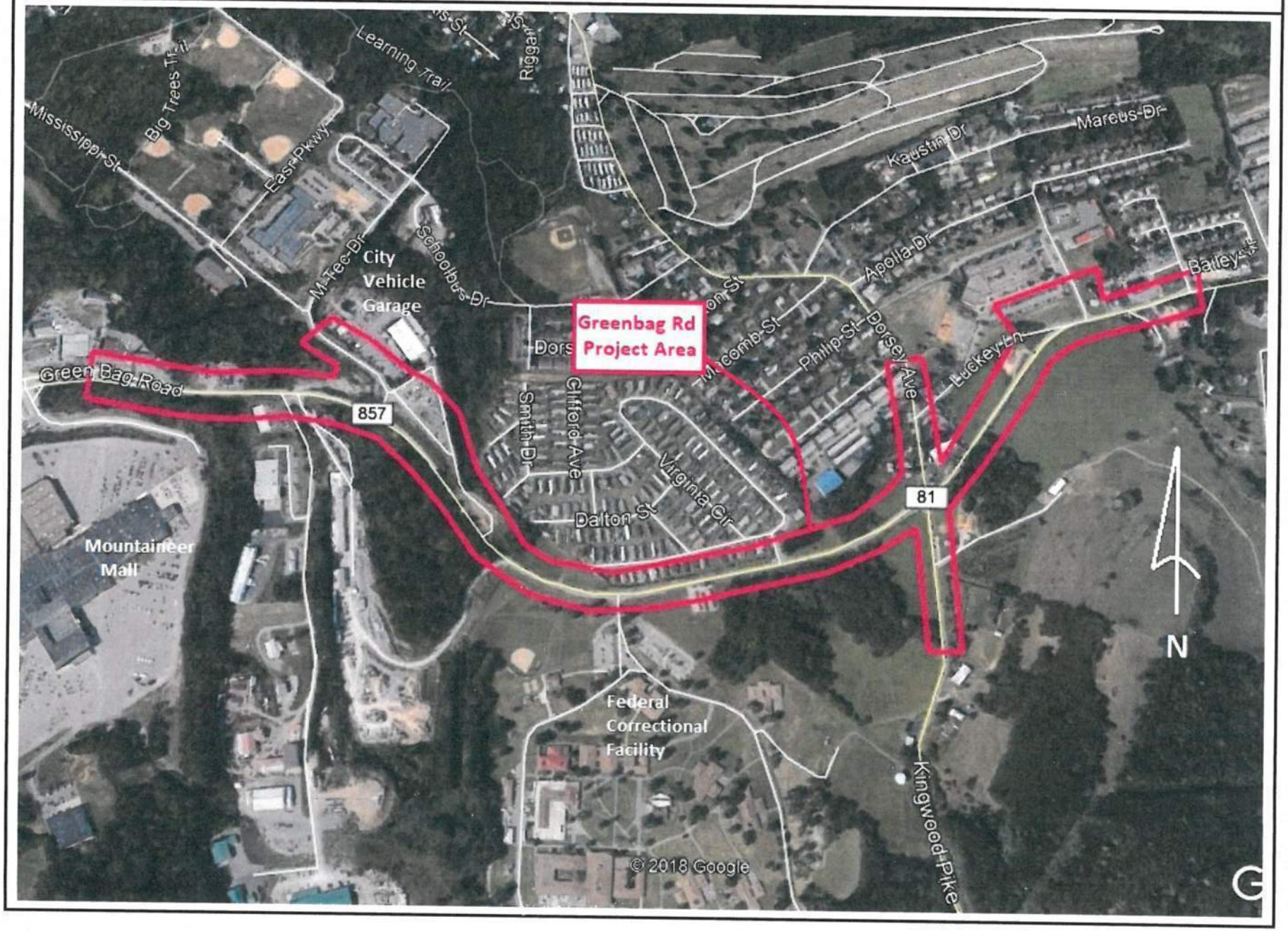
GREENBAG ROAD IMPROVEMENTS
State Project U331-857-0.67
MONONGALIA COUNTY



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GREENBAG ROAD IMPROVEMENTS
State Project U331-857-0.67
MONONGALIA COUNTY



Bakic, Tracy D

From: Bakic, Tracy D
Sent: Thursday, January 31, 2019 2:03 PM
To: Danielle Parker
Subject: Greenbag Road Improvements (MONONGALIA)
Attachments: Greenbag Road Improvements-PAWV.pdf

Danielle,

Please see the attached letter. The original is being sent USPS.

Sincerely,

Tracy

Tracy D. Bakic
Structural Historian
WV Division of Highways
Engineering Division-Environmental Section
1334 Smith Street
Charleston, WV 25301
Email: Tracy.D.Bakic.@wv.gov
Office: 304-558-9676
Fax: 304-558-7296

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

January 30, 2019

Ms. Hannah Dye, Vice Chair
Monongalia County Historic Landmarks Commission
Monongalia County Courthouse
243 High Street, Room 202
Morgantown, WV 26505

Dear Ms. Dye:

State Project U331-857-0.67
Federal Project STP-0857(019)D
Greenbag Road Improvements
Monongalia County

The West Virginia Division of Highways (WVDOH) is developing the subject project at the location shown on the attached maps. The work will take place mainly on Greenbag Road – aka County Route 857 (CO 857) - in the Morgantown area in Monongalia County. The west terminus of the project is about 0.40 miles east of the Greenbag Rd-US 119 intersection and the east terminus is at Jonathan Lane about 0.36 miles east of the Greenbag Rd-Kingwood Pike/Dorsey Ave intersection. Associated project work is proposed on Mississippi Ave, Dorsey Ave, Luckey Lane, and Kingwood Pike. Proposed work includes: lane & shoulder widening; intersection improvements, including turn lanes; sidewalk installation along the north side of Greenbag Rd; installation of a roundabout at the Mississippi Ave intersection; and drainage improvements. During construction traffic will be maintained using single-lane closures as needed.

We are asking your organization for any comments you may have related to the proposed project and/or historical information you may have associated with the development of roads and surrounding properties dating to 1975 and earlier. Properties of interest include: older residences/farms, later housing and commercial development: and the federal correctional facility.

Should you have comments or require additional information, please contact Tracy Bakic of our Environmental Section at (304) 558-9676 or tracy.d.bakic@wv.gov.

Very truly yours,

Ben L. Hark
Environmental Section Head
Engineering Division

BH:s
Attachments
bcc: DDE(TDB)

Bakic, Tracy D

From: Paula McClain <pmcclain@millsgrouponline.com>
Sent: Thursday, November 14, 2019 5:37 PM
To: Bakic, Tracy D
Cc: Hannah Dye
Subject: RE: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Hi Tracy,

The Monongalia County HLC held our November meeting today, reviewed the updated APE for the Greenbag Road Improvement project, and are recommending that no historic resources will be impacted. Please let me know if you need any other sort of documentation from us regarding this.

Thanks,

Paula

From: Bakic, Tracy D [mailto:Tracy.D.Bakic@wv.gov]
Sent: Monday, November 04, 2019 3:07 PM
To: Paula McClain <pmcclain@millsgrouponline.com>
Cc: Hannah Dye <hld52910@gmail.com>
Subject: RE: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Ms. McClain -

It has been about 8 months since WVDOH's last correspondence with MCHLC regarding comments or historical information may have about the Greenbag Road Improvements Project. Previous correspondence has been with Hannah Dye and I have cc'd her for this update as well.

Recently the Greenbag Road Improvement project area was expanded to east to include Greenbag Road to its intersection Aaron Creek, just prior to the intersection with County Rt 64/1 (Lower Aaron Creek Rd). I am sharing this with you to see if the additional area sparks any project comment or historical information. The previous correspondence and an addition map showing the expanded area should be attaches.

We are still working on a rigorous schedule to complete environmental work for this project. Therefore an asap response – let's say by Friday, November 15, 2019 – would be most appreciated.

Thank you so much again for your time and interest.

Sincerely,

Tracy Bakic

Tracy D. Bakic
Structural Historian
WV Division of Highways
Engineering Division-Environmental Section
1334 Smith Street
Charleston, WV 25301
Email: Tracy.D.Bakic.@wv.gov

Office: 304-414-6407
Fax: 304-558-7296

From: Bakic, Tracy D
Sent: Monday, February 25, 2019 9:21 AM
To: 'Hannah Dye' <hld52910@gmail.com>
Subject: RE: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Ok. Thank you, Hannah.

In appreciation,

Tracy

From: Hannah Dye <hld52910@gmail.com>
Sent: Monday, February 25, 2019 9:18 AM
To: Bakic, Tracy D <Tracy.D.Bakic@wv.gov>
Subject: Re: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Hi Tracy,

One of our members was going to respond in writing but if you haven't received that yet...there was no concern.

On Mon, Feb 25, 2019, 8:28 AM Bakic, Tracy D <Tracy.D.Bakic@wv.gov> wrote:

> Hello Hannah –
>
> I just want to catch up and see if there were any project comments or shared history information related to the Greenbag Road project at you last HLC MCHLC meeting (Feb. 21).
>
> Thanks again for your interest.
>
> Sincerely,
>
> Tracy
>
> Tracy D. Bakic
>
> Structural Historian

WV Division of Highways

Engineering Division-Environmental Section

1334 Smith Street

Charleston, WV 25301

Email: Tracy.D.Bakic.@wv.gov

Office: 304-558-9676

Fax: 304-558-7296

From: Bakic, Tracy D
Sent: Monday, February 11, 2019 10:24 AM
To: 'Hannah Dye' <hld52910@gmail.com>
Subject: RE: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Hannah –

Yes, that is fine. Even if the historic resources reporting for this project get submitted before that date, any correspondence afterward will be reviewed and we (WVDOH) can submit it to our reviewer (WV State Historic Preservation Officer).

Thanks so much –

Tracy

From: Hannah Dye <hld52910@gmail.com>
Sent: Monday, February 11, 2019 10:06 AM
To: Bakic, Tracy D <Tracy.D.Bakic@wv.gov>
Subject: Re: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Hi Tracy,

I did receive your letter and emailed it to all of our members to discuss at our February meeting on the 21st. Can I get back with you as soon as we meet?

Thanks,

Hannah

On Mon, Feb 11, 2019, 8:40 AM Bakic, Tracy D <Tracy.D.Bakic@wv.gov wrote:

> Ms. Dye.
>
> I am sending this as a follow-up to my previous request (below) for project comments or historical information related to the Greenbag Road Improvement Project. It has been a very short time since I sent the original correspondence. This is due to the timeline of the project being a faster pace than typical.
>
> If you may have any historic information about the area or comments about the project, please do contact me as soon as possible.
>
> In appreciation,
>
> Tracy Bakic
>
> WVDOH Structural Historian
>
> ---
>
> **From:** Bakic, Tracy D
> **Sent:** Thursday, January 31, 2019 2:08 PM
> **To:** 'Hannah Dye' <hld52910@gmail.com>
> **Subject:** Greenbag Road Improvements, Morgantown (MONONGALIA)
>
> Ms. Dye,

Attached please find a letter related to the proposed Greenbag Road Improvement Project in Morgantown area. The originals are being sent USPS to the county office and to the personal address you provided. I sent to both address and will use the version with the county address in the correspondence attachments for my reporting.

If you have any comments about the project or historical information to share about the road and/or surrounding properties, please contact me using the information below.

Thank you so much.

Sincerely,

Tracy Bakic

Tracy D. Bakic

Structural Historian

WV Division of Highways

Engineering Division-Environmental Section

1334 Smith Street

Charleston, WV 25301

Email: Tracy.D.Bakic.@wv.gov

Office: 304-558-9676

Fax: 304-558-7296

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

January 30, 2019

Mr. Ed Hawkins, President
Monongalia Historical Society
PO Box 127
Morgantown, WV 26507-0127

Dear Mr. Hawkins:

State Project U331-857-0.67
Federal Project STP-0857(019)D
Greenbag Road Improvements
Monongalia County

The West Virginia Division of Highways (WVDOH) is developing the subject project at the location shown on the attached maps. The work will take place mainly on Greenbag Road – aka County Route 857 (CO 857) - in the Morgantown area in Monongalia County. The west terminus of the project is about 0.40 miles east of the Greenbag Rd-US 119 intersection and the east terminus is at Jonathan Lane about 0.36 miles east of the Greenbag Rd-Kingwood Pike/Dorsey Ave intersection. Associated project work is proposed on Mississippi Ave, Dorsey Ave, Luckey Lane, and Kingwood Pike. Proposed work includes: lane & shoulder widening; intersection improvements, including turn lanes; sidewalk installation along the north side of Greenbag Rd; installation of a roundabout at the Mississippi Ave intersection; and drainage improvements. During construction traffic will be maintained using single-lane closures as needed.

We are asking your organization for any comments you may have related to the proposed project and/or historical information you may have associated with the development of roads and surrounding properties dating to 1975 and earlier. Properties of interest include: older residences/farms, later housing and commercial development: and the federal correctional facility.

Should you have comments or require additional information, please contact Tracy Bakic of our Environmental Section at (304) 558-9676 or tracy.d.bakic@wv.gov.

Very truly yours,

Ben L Hark

Ben L. Hark
Environmental Section Head
Engineering Division

BH:s
Attachments
bcc: DDE(TDB)

Bakic, Tracy D

From: Bakic, Tracy D
Sent: Monday, November 4, 2019 3:10 PM
To: Dr.hawk@comcast.net
Cc: clutterina@hotmail.com
Subject: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)
Attachments: Greenbag Road Improvements-MHS.pdf; Updated Project Area 11-2019.pdf

Mr. Hawkins -

It has been about 8 months since WVDOH's last correspondence with MCHLC regarding comments or historical information may have about the Greenbag Road Improvements Project. Previous correspondence has been with Hannah Dye and I have cc'd her for this update as well.

Recently the Greenbag Road Improvement project area was expanded to east to include Greenbag Road to its intersection Aaron Creek, just prior to the intersection with County Rt 64/1 (Lower Aaron Creek Rd). I am sharing this with you to see if the additional area sparks any project comment or historical information. The previous correspondence and an addition map showing the expanded area should be attaches.

We are still working on a rigorous schedule to complete environmental work for this project. Therefore an asap response – let's say by Friday, November 15, 2019 – would be most appreciated.

Thank you so much again for your time and interest.

Sincerely,

Tracy Bakic

From: Bakic, Tracy D
Sent: Monday, February 11, 2019 8:39 AM
To: 'Dr.hawk@comcast.net' <Dr.hawk@comcast.net>
Cc: 'clutterina@hotmail.com' <clutterina@hotmail.com>
Subject: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Dr. Hawkins et al.

I am sending this as a follow-up to my previous request (below) for project comments or historical information related to the Greenbag Road Improvement Project. It has been a very short time since I sent the original correspondence. This is due to the timeline of the project being a faster pace than typical.

If you may have any historic information about the area or comments about the project, please do contact me as soon as possible.

In appreciation,

Tracy Bakic
WVDOH Structural Historian

From: Bakic, Tracy D
Sent: Thursday, January 31, 2019 2:08 PM
To: 'Dr.hawk@comcast.net' <Dr.hawk@comcast.net>
Cc: 'clutterina@hotmail.com' <clutterina@hotmail.com>
Subject: Greenbag Road Improvements, Morgantown (MONONGALIA)

Dr. Hawkins et al.

Attached please find a letter related to the proposed Greenbag Road Improvement Project in Morgantown area. The original is being sent USPS. If you have any comments about the project or historical information to share about the road and/or surrounding properties, please contact me using the information below.

If any contact information for your organization has changed (ie, lead contact, address, phone/email) please do update us.

Thank you so much.

Sincerely,

Tracy Bakic

Tracy D. Bakic
Structural Historian
WV Division of Highways
Engineering Division-Environmental Section
1334 Smith Street
Charleston, WV 25301
Email: Tracy.D.Bakic@wv.gov
Office: 304-558-9676
Fax: 304-558-7296

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Thomas J. Smith, P. E.
Secretary of Transportation/
Commissioner of Highways

January 30, 2019

Morgantown Historic Landmarks Commission
City of Morgantown
389 Spruce Street
Morgantown, WV 26505

To Whom It Concerns:

State Project U331-857-0.67
Federal Project STP-0857(019)D
Greenbag Road Improvements
Monongalia County

The West Virginia Division of Highways (WVDOH) is developing the subject project at the location shown on the attached maps. The work will take place mainly on Greenbag Road – aka County Route 857 (CO 857) - in the Morgantown area in Monongalia County. The west terminus of the project is about 0.40 miles east of the Greenbag Rd-US 119 intersection and the east terminus is at Jonathan Lane about 0.36 miles east of the Greenbag Rd-Kingwood Pike/Dorsey Ave intersection. Associated project work is proposed on Mississippi Ave, Dorsey Ave, Luckey Lane, and Kingwood Pike. Proposed work includes: lane & shoulder widening; intersection improvements, including turn lanes; sidewalk installation along the north side of Greenbag Rd; installation of a roundabout at the Mississippi Ave intersection; and drainage improvements. During construction traffic will be maintained using single-lane closures as needed.

We are asking your organization for any comments you may have related to the proposed project and/or historical information you may have associated with the development of roads and surrounding properties dating to 1975 and earlier. Properties of interest include: older residences/farms, later housing and commercial development: and the federal correctional facility.

Should you have comments or require additional information, please contact Tracy Bakic of our Environmental Section at (304) 558-9676 or tracy.d.bakic@wv.gov.

Very truly yours,

Ben L. Hark
Environmental Section Head
Engineering Division

BH:s
Attachments
bcc: DDE(TDB)

Bakic, Tracy D

From: Shannon Tinnell <shannontinnell@earthlink.net>
Sent: Wednesday, February 13, 2019 11:24 AM
To: Bakic, Tracy D
Subject: Re: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Ms. Bakic,
Hello, I hope you are well. Sorry for the delay in my response, I was awaiting comments from the committee. The boundaries of the Greenbag Road improvements seem to be outside city limits(and our jurisdiction) and considering there are no historic structures to consider, we don't have any comments. You might reach out to the Monongalia County Historic Commission. I can type of a letter for your records if needed. I just wanted to let you know sooner than later.
Best,
Shannon

-----Original Message-----
From: "Bakic, Tracy D"
Sent: Feb 11, 2019 8:38 AM
To: Shannon Tinnell
Cc: Christine Wade , "hcarl@morgantownwv.gov"
Subject: FW: Greenbag Road Improvements, Morgantown (MONONGALIA)

Ms. Tinnell et al.

I am sending this as a follow-up to my previous request (below) for project comments or historical information related to the Greenbag Road Improvement Project. It has been a very short time since I sent the original correspondence. This is due to the timeline of the project being a faster pace than typical.

If you may have any historic information about the area or comments about the project, please do contact me as soon as possible.

In appreciation,

Tracy Bakic
WVDOH Structural Historian

From: Bakic, Tracy D
Sent: Thursday, January 31, 2019 2:05 PM
To: 'shannontinnell@earthlink.net' <shannontinnell@earthlink.net>
Cc: 'cwade@morgantownwv.gov' <cwade@morgantownwv.gov>; 'hcarl@morgantownwv.gov' <hcarl@morgantownwv.gov>
Subject: Greenbag Road Improvements, Morgantown (MONONGALIA)

To Whom It Concerns:

Attached please find a letter related to the proposed Greenbag Road Improvement Project in Morgantown area. The original is being sent USPS. If you have any comments about the project or historical information to share about the road and/or surrounding properties, please contact me using the information below.

If any contact information for your organization has changed (ie, lead contact, address, phone/email) please do update us. I previously had Shannon Tinnell listed as the lead contact, but since some time had passed what uncertain of directing the main to a particular lead (ie, Chair or President). If there is a particular lead member at this time, please let me know for our records.

Thank you so much.

Sincerely,

Tracy Bakic

Tracy D. Bakic
Structural Historian
WV Division of Highways
Engineering Division-Environmental Section
1334 Smith Street
Charleston, WV 25301
Email: Tracy.D.Bakic.@wv.gov
Office: 304-558-9676
Fax: 304-558-7296

APPENDIX F

WV HPI FORMS



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 100 Luckey Lane	**Common/Historic Name/Both** ○ ○ ◉ Harner Chapel	**Field Survey #**	**Site # *(SHPO Only)*** MG-1332
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1914	**Style** Gothic - Carpenter	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉	**UTM#** 17 S 590575 E / 590575 N	 Photograph 1. MG-1332 / Harner Chapel, facade and rear addition, facing northeast	
Survey Organization & Date The Markosky Engineering Group, December 4, 2018	**Quadrangle Name** Morgantown South **Part of What Survey/FR#** Greenbag Road Improvements/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-1332

Site No.

N

Present Owners	Owners Mailing Address
Harner Chapel Phone #	100 Luckey Lane Morgantown, WV 26505

Describe Setting

See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2 **Stories** 3 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No**

If yes, describe

Alterations include replacement siding and roof materials and alterations to the original spire on the facade.

Additions ◉ **Yes** ○ **No**

If yes, describe

A ca. 1955 addition has been appended to the rear of the church.

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

This program receives federal funds from the National Park Service. Regulations of the U. S. Department of the Interior prohibit unlawful discrimination in department Federally Assisted Programs on the basis of race, color, national origin, age or handicap. Any person who believes he or she has been discriminated against in any program, activity, or facility operated by a recipient of Federal Assistance should write to: Director, Equal Opportunity Program, U.S. Department of the Interior, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Harner Chapel **SITE#** MG-1332

MG-1332 / Harner Chapel is located on the northeast quadrant of the intersection of Luckey Lane and Dorsey Avenue. The chapel is located approximately 1.55 miles southeast of the city of Morgantown and is set within an area of mixed single family and multi-unit residences and commercial development. Harner Chapel was previously surveyed in 1982, but it was not evaluated for NRHP eligibility (Toth 1982).

Harner Chapel is a ca. 1914 Carpenter Gothic frame building covered in vinyl siding and capped by a hipped roof covered in asphalt shingle (Photographs 1-2). The chapel rests on a rock faced concrete block foundation, and its façade features a narthex with a full height bell tower capped by a simple ca. 1990 spire with fixed Gothic arch windows. The fenestration of the chapel consists of Gothic arch windows and paired vinyl sash, one-over-one windows in the ca. 1955 two-story rear addition. A ca. 1990 partial width, shed roof addition has been appended to the northeast elevation. The reconfiguration of the bell tower with a non-historic spire, the large rear addition, and the use of replacement roofing and cladding materials has compromised the historic integrity of the chapel.

Harner Chapel was organized in 1909. The impetus for its organization and eventual construction was the success of Methodist revival meetings that were held at the Dorsey Schoolhouse (which was replaced by the Dorsey School ca. 1920). The land for the chapel was donated by local resident Fairchild Harner and the chapel was dedicated in 1914 (The Monongalia Historical Society 1954:82). In 1939 the chapel became known as the United Methodist Church, and the rear addition was added ca. 1955 (Toth 1982:4). The chapel continues to hold services.

No information was recovered linking the Harner Chapel to events significant on the local, state, or national level. The chapel stands as a common example of an early 20th century rural religious structure which can be found throughout Monongalia County. Therefore, Harner Chapel is not eligible for NRHP listing under Criterion A. The land on which the chapel was built was donated by Fairchild Harner, a local resident. No information was recovered to suggest that Harner was significant on the local, state, or national level. Therefore, Harner Chapel is not eligible under Criterion B.

Harner Chapel stands as a common, unexceptional, and altered example of a rural religious structure. Harner Chapel does not possess high artistic value, represent the work of a master, or embody the distinctive characteristics of a type, period, or method of construction. Therefore, it is not eligible for listing under Criterion C. The church has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory. The church is not eligible for NRHP listing under Criteria Consideration A: Religious Properties as it is not significant on architectural, artistic, or historic grounds.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Harner Chapel** **SITE#** **MG-1332**

References

The Monongalia Historical Society

1954 *The 175th Anniversary of the Formation of Monongalia County, West Virginia and other Relative Historical Data.* The Monongalia Historical Society, Morgantown, West Virginia.

Toth, Gary J.

1982 *Historic Properties Inventory Form – Harner Chapel*. On file, West Virginia Department of Culture and History, Charleston, West Virginia.

United States Geological Survey (USGS)

1902 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

1925 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

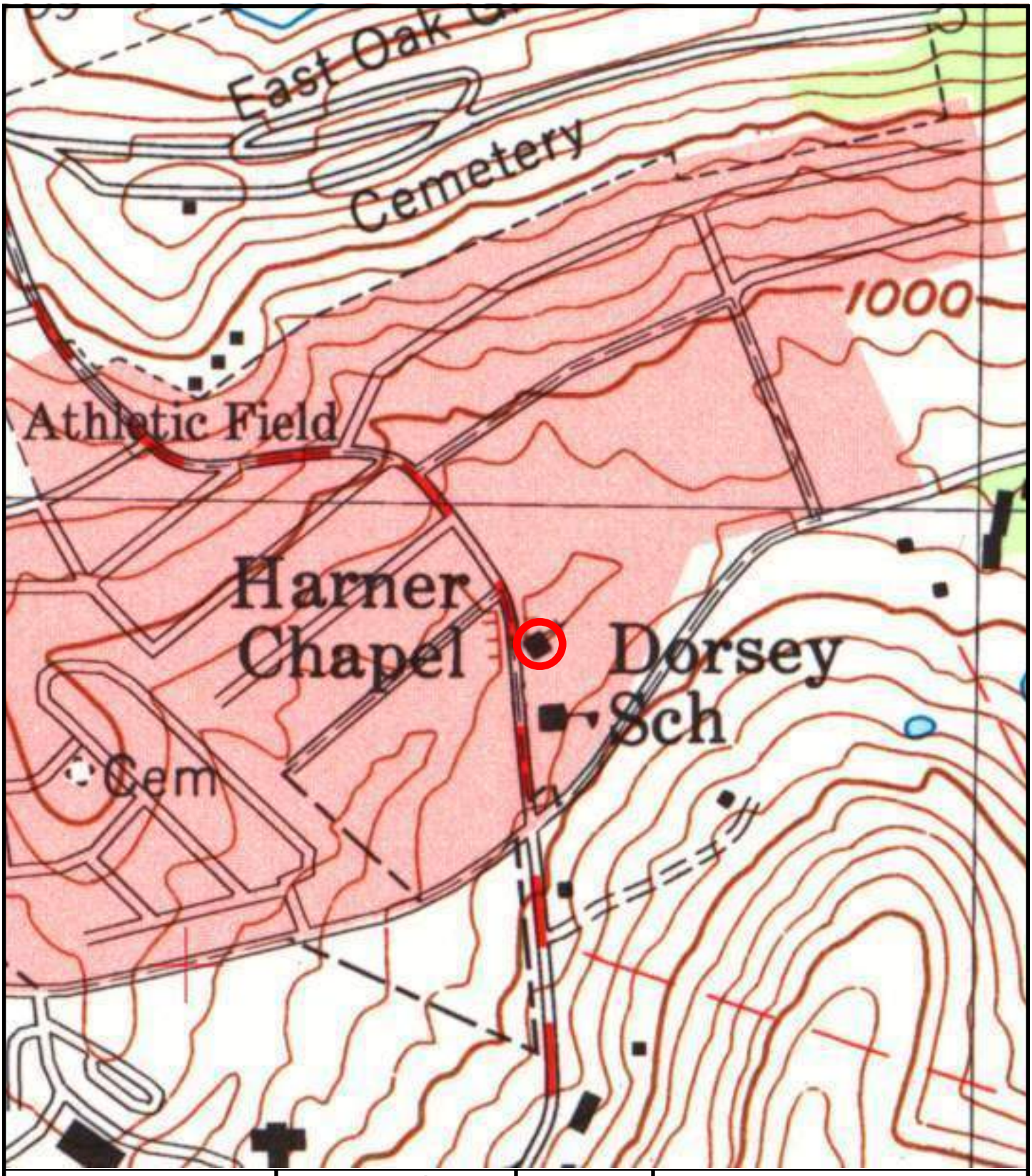
NAME Harner Chapel **SITE#** MG-1332



Photograph 1. Façade and rear addition (left), facing northeast (2018-12-04)



Photograph 2. Northeast elevation, facing northwest (2018-12-04)



Feet
0 375 750

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-1332
Harner Chapel (100 Luckey Lane)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

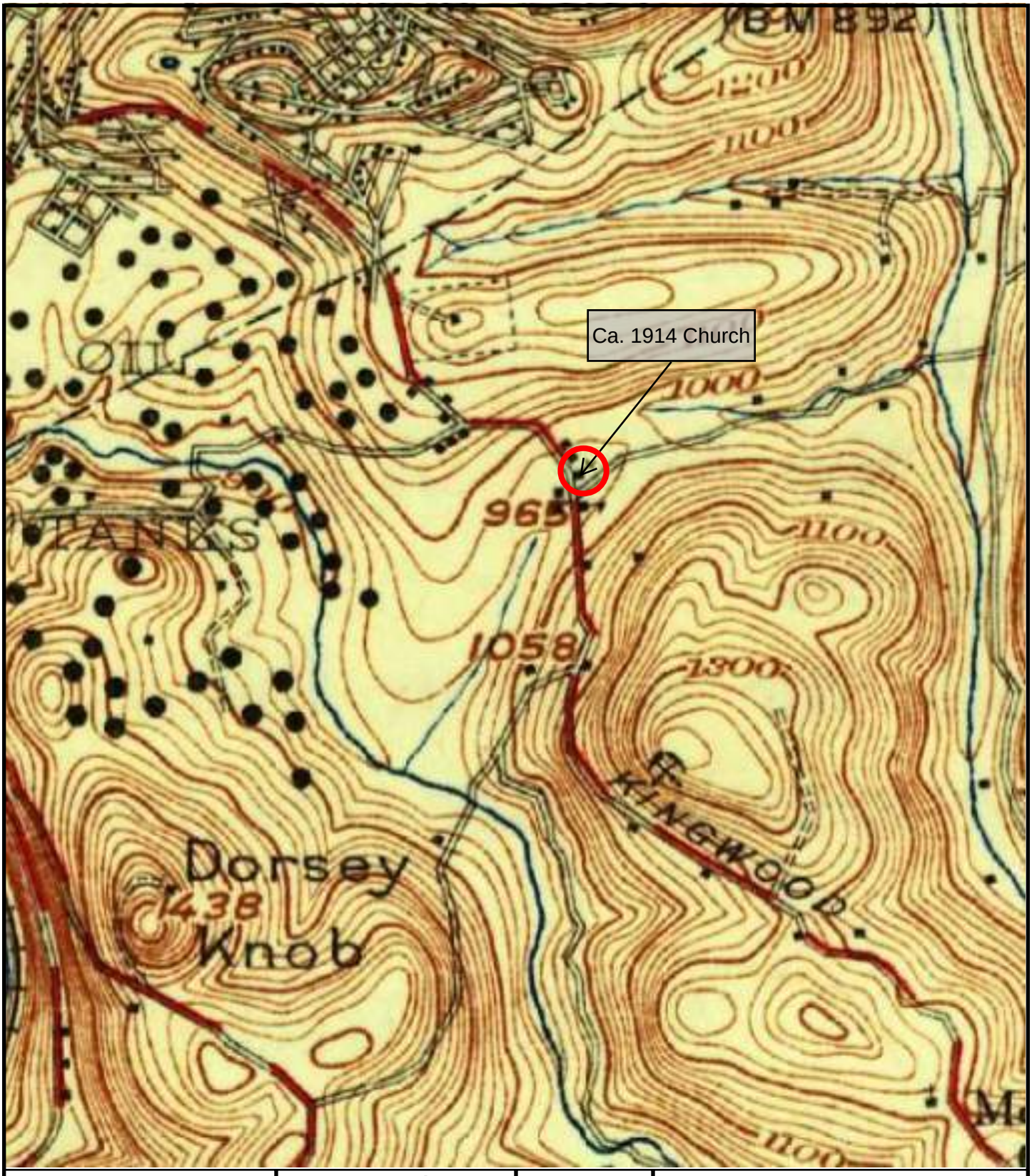
N
W E
S

Site Map
MG-1332
Harner Chapel (100 Luckey Lane)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



*Not to scale

Legend

Location of Historic Structure

N
W E
S

Figure 1. 1925 USGS Map
MG-1332
Harner Chapel (100 Luckey Lane)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1925

MG 33I

MG-1332

HISTORIC PROPERTIES INVENTORY FORM

(Staff Use Only)

HISTORIC PRESERVATION UNIT
DEPARTMENT OF CULTURE & HISTORY
SCIENCE & CULTURE CENTER
CHARLESTON, WEST VIRGINIA 25305

17-590-440-4384-050

1. NAME(S), historic/common: Harner Chapel

2. LOCATION, street/road: Old Kingwood Pike

city/town: Morgantown, W.Va. 26505
(incorporated/~~unincorporated~~)

3. USE/FUNCTION, present: United Methodist Church. (public/~~private~~, ~~restricted~~)

original: Methodist Protestant Church.

4. OWNER/ADDRESS, present: United Methodist Conference (public/~~private~~)
900 Washington St. E.
Charleston, W.Va.

original: Methodist Protestant Conference

5. PHOTO/SKETCH OF:



7. PLAN (include approx. dimensions):

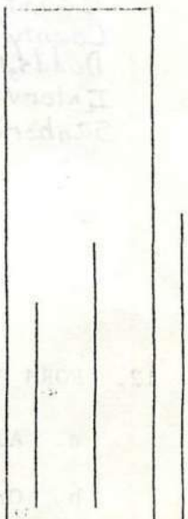


40'X60'

6. LOCALE/ENVIRONMENT (map):



8. ACREAGE (approx.):
138 X 94.15 IRR.
Kingwood Pike Lot
Morgan District



DESCRIPTION (clarify as appropriate):

9. a. Exterior Fabric

stone
brick
concrete
stucco
weatherboard
clapboard
board & batten
shingle
other X
Aluminum siding

b. Structural System

masonry
frame X
log
metal
other

foundation four foot
stone walls

c. Roofing Material

wood
metal
slate
tile
asphalt shingles
composition
other

d. Associated Structures (use/type):

outbuildings None

dependencies Educational
wing to the back of the building.

other None

e. Integrity (include dates):

original site/~~relocated~~

alterations 1967-8, New front and porch were added.
1981, New stained glass windows from Rainbow Glass of Clarksburgh.
additions 1954, the educational facilities to the building, and aluminum siding was added to the exterior.

f. Condition:

excellent
good X
fair
deteriorated
abandoned

g. Threats:

None

10. SIGNIFICANCE (use additional sheet if necessary):

a. Architect/Builder/Engineer:
Builders: The men of the community.

b. Style/Period: —

c. Date(s): 1914

11. BIBLIOGRAPHY:

County Records: Deed Bk.
County Tax Assessor's Maps.
Dodds, Mrs. Gideon. The 175th Anniversary of Monongalia County. Morgantown: The Historical Society; 1954.
The Harner-Jones' Telephone Directory, St. Louis, Missouri; Pictorial Church Directories of America: 1981
Interview with Rev. Swecker by Gary J. Toth (April 1982).

12. FORM PREPARED BY: Gary J. Toth DATE:

a. Address 280 N. Main St., Star City, W.Va. 26505

b. Organization W. V. U.







Harner Chapel

"Sabbath School" was organized at Dorsey's School House on April 19, 1908. This was the earliest activity which was to culminate in the establishment of the church called Harner Chapel. The Rev. M.H. Steele noted in July of 1908 that he had preached three times at Dorsey School House and received $4.50. The congregation grew rapidly and the group at Dorsey School House was soon to be recognized as a congregation on the South Morgantown Cicuit of the Methodist Protestant Church. Thus, with a membership of 45, Harner Chapel was organized. It proved to be a vital addition to the circuit, adding the strength of new members and improved financial support throughout the years. In 1939, it became known as the United Methodist Church.

In the 1950's, the church continued to grow. In July, 1954, the church secured a loan to begin major improvements on the church building. Throughout the years this church lent its facilities to outside groups and raising money.

The following is the property transaction of the church:

Grantor: Fairchild Harner

Grantee:Methodist Protestant Church trustees

Amt. of Land:138 X 94.15 irr., Kingwood Pike Lot

Date: 11/10/09

Deed Ref: 107/102



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 796 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ House at 796 Greenbag Road	**Field Survey #**	**Site # *(SHPO Only)*** MG-2640
Town or Community Morgantown vicinity	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** ca. 1940	**Style** Craftsman Style Bungalow	
Exterior Siding/Materials Synthetic - Vinyl	**Roofing Material** Asphalt - Shingle	**Foundation** Stucco Covered	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 591233 E / 4385053 N	 Photograph 1. MG-2640 / House at 796 Greenbag Road, east (side) elevation, facing west	
Survey Organization & Date The Markosky Engineering Group, October 31, 2019	**Quadrangle Name** Morgantown South, WV **Part of What Survey/FR#** Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
MG-2640
049

N

Present Owners
Emily Jane Chilko

Phone #

Owners Mailing Address
796 Greenbag Road
Morgantown, WV 26508

Describe Setting
See continuation sheets

0.5 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present)
1.5 **Stories** 3 **Front Bays**

See continuation sheets

(Use Continuation Sheets)

Alterations
◉ **Yes** ○ **No**
If yes, describe
See continuation sheets

Additions
◉ **Yes** ○ **No**
If yes, describe
See continuation sheets

Describe All Outbuildings
See continuation sheets

(Use Continuation Sheets)

Statement of Significance
See continuation sheets

(Use Continuation Sheets)

Bibliographical References
See continuation sheets

(Use Continuation Sheets)

Form Prepared By: Laura C. Ricketts **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group
Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 796 Greenbag Road **SITE#** MG-2640

The MG-640 / House at 796 Greenbag Road is an altered bungalow that sits at the top of a steep drive on a heavily wooded lot on former farmland on the south side of Greenbag Road. The façade (north elevation) is completely obscured by trees and vegetation. It is surrounded to the west, south, southeast, and northeast by non-historic churches that have been built to serve the increasingly suburban area.

The altered house appears to be a late example of a Craftsman Style bungalow with front and rear shed roof dormers protruding from the steep side gable roof. It retains knee braces under the gables, but otherwise features replacement siding, roofing, and windows. The formerly open integral front porch has been partially enclosed, and the house has a non-historic rear porch addition.

An outbuilding, which is located to the southwest of the house at the top of the driveway and presumed to be a detached garage, was obscured by tree cover.

The House at 796 Greenbag Road represents an altered and unremarkable example of a common house type from the early 20th century (ca. 1940). It does not appear to be associated with any significant events; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

Bibliographical References

Google Earth

2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)

1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

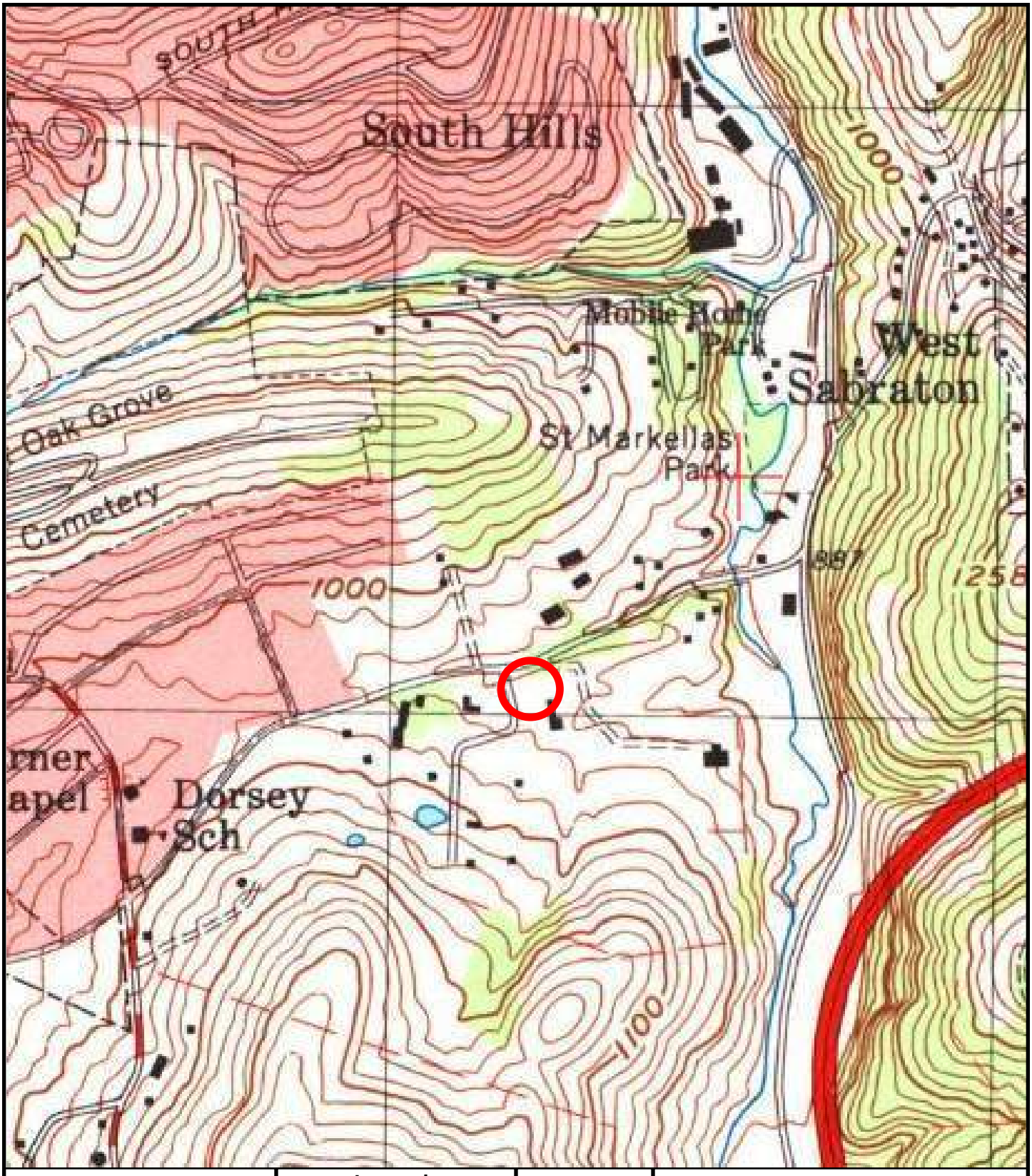
NAME House at 796 Greenbag Road **SITE#** MG-2640



Photograph 1. East (side) elevation, facing west



Photograph 2. East and north (front) elevations, facing southwest



Feet
0 625 1,250

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2640
House at 796 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2640
House at 796 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2019



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 834 Greenbag Road	**Common/Historic Name/Both** ○ ◉ ○ Campbell Farmhouse	**Field Survey #**	**Site # *(SHPO Only)*** MG-2641
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** ca. 1886	**Style** Italianate	
Exterior Siding/Materials Brick	**Roofing Material** Asphalt - Shingle	**Foundation** Not visible	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 591483 E / 4385129 N	 Photograph 1. MG-2641 / Campbell Farmhouse, north and west (front) elevations, facing southeast	
Survey Organization & Date The Markosky Engineering Group, October 2019	**Quadrangle Name** Morgantown South, WV		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
MG-2641
I-79
2-5041

N

Present Owners	Owners Mailing Address
Phyllis Jenkins Irrevocable Trust **Phone #**	834 Greenbag Road Morgantown, WV 26508

Describe Setting

See continuation sheets

10.9 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) _____**Stories** _____**Front Bays**

See continuation sheets

(Use Continuation Sheets)

Alterations ○ **Yes** ○ **No** **If yes, describe**

See continuation sheets

Additions ○ **Yes** ○ **No** **If yes, describe**

See continuation sheets

Describe All Outbuildings

See continuation sheets

(Use Continuation Sheets)

Statement of Significance

See continuation sheets

(Use Continuation Sheets)

Bibliographical References

See continuation sheets

(Use Continuation Sheets)

Form Prepared By: Laura C. Ricketts **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Campbell Farmhouse **SITE#** MG-2641

The late 19th century Campbell Farmhouse located at 834 Greenbag Road is a two-story Italianate farmhouse, which was constructed ca. 1886. It sits on a flattened hilltop above Greenbag Road on a property comprised of gently rolling farmland with a meandering creek, several tree lines, and a number of outbuildings dating to the mid-20th century. The 19th century farm formerly occupied at least 126 acres in the vicinity of Aaron Creek, but its tax parcel currently measures closer to 23.9 acres since much of the former farmland has been subdivided and sold off to support nearby suburban development. It is surrounded by mid- and late 20th century residences and housing developments, commercial buildings, and several non-historic churches.

A long gravel driveway leads up a steep embankment from Greenbag Road at the north edge of the farm to the two-story brick Campbell Farmhouse at the heart of the farmstead (Photographs 1-3). The Italianate farmhouse, which was built ca. 1886, has a T-shaped plan formed by the five bay front section of the farmhouse and a perpendicular two-story rear ell. The farmhouse has a three gable roof with prominent gable returns and replacement asphalt shingle roofing. Two interior end brick chimneys flank the main section of the house and a third brick chimney is located at the center of the rear ell. The brick walls are laid in an American common bond pattern with seventh row headers and feature tall segmental arch window openings on all elevations, although at least one window on the south (side) elevation has been bricked in and one window on the east (rear) elevation has been resized. The current windows are one-over-one metal sash replacements. The farmhouse has a full width front porch with a shallow half hipped roof, turned posts, and scroll sawn brackets. Similar scrolled brackets line the cornice under the eaves. A secondary porch is located on the north elevation of the rear ell. The farmhouse has the characteristic massing, design, and ornamentation of a classic Italianate Style dwelling.

The other buildings on the property are part of the setting of the Campbell Farmhouse, but they do not contribute to its significance. They represent changes made to the property in the 1940s and 1950s that replaced the earlier outbuildings and farm structures that would have been associated with the farmhouse historically. A two-tone concrete block dairy barn from ca. 1948 is located behind the farmhouse to the east (Photograph 4). The upper story of the main section of the barn has a frame structure clad with faux brick asphalt sheeting over vertical wood boards. A contemporary one-story milkhouse section is appended to the south elevation of the barn, and two concrete stave silos from ca. 1954 are located behind the barn to the east. A small frame barn that appears to date to ca. 1948 is located to the east of the barn but was not visible for survey with limited access to the property. A secondary dwelling, built ca. 1940, is located to the north of the dairy barn closer to Greenbag Road (Photograph 4). The one-story front gable dwelling is vacant and is in a partially dilapidated state with a partially removed front porch and collapsing roof. It is clad with a mixture of particle board, plywood, and weatherboard. There is also a small outbuilding from ca. 1940 located at the end of a row of pine trees to the southwest of the farmhouse (Photograph 5). The one-story, rectangular plan outbuilding appears to have a structure composed of both concrete block and frame. It has a

front gable roof that is covered in tar paper and an exterior brick chimney on the west (side) elevation.

The Campbell Farmhouse retains its integrity. Despite a few alterations to its historic form (replacement windows and roofing as well as minor changes to the fenestration pattern), the farmhouse retains its integrity of design, materials, and workmanship. Its location remains intact, and its immediate setting remains rural and agricultural though the surviving outbuildings date from a later period. Its larger setting has been impacted by the loss of more than 100 acres of farmland and relatively dense highway-oriented suburban development. The Campbell Farmhouse retains the feeling of a late 19th century Italianate farmhouse, but it lacks the association with former outbuildings and farmland.

The deed history for the property refers to the bulk of the farm (about 100 acres) as the Bunner Home Farm, but also associates the property with a 26-acre holding that formerly belonged to the Campbell Family that was consolidated in the late 19th century (Monongalia County Deeds). A detailed map of the Morgan District from 1886 identifies the home of Dr. F. Campbell at the approximate location of the farmstead, and the deed history suggests that it was around this era that the farm was established, which is corroborated stylistically by the architecture of the Italianate farmhouse. L.F. Campbell was listed in the 1880 federal population census as a 59 year old physician suffering from rheumatism, who was living in the Morgan District of Monongalia County with his wife Eliza and his 14 year old son William (US Census 1880).

By 1911, the farm with the Campbell Farmhouse was fully under the control of the Bunner family and being referred to as the Bunner Home Farm. In that year, the property was transferred by the last will and testament of Emma J. Bunner to her husband Francis M. Bunner and their son Thompson Orth Bunner (Monongalia County Wills 1911). The 1910 population census records 60 year old Emma J. Bunner living on the farm with her husband, who was a steamboat engineer, their son Arthur, who was a farm laborer, a servant, and three boarders (US Census 1910). Ten years later in 1920, the census describes Orth T. Bunner as a 34 year old farmer living on a dairy farm with his wife Bessie and their 13 year old nephew (US Census 1920).

In 1920, the deed recording the sale of the farm from Thompson Orth Bunner to a single woman named Mabel Student provided additional information about the personal property situated on the Bunner Home Farm:

> Seventeen (17) head of milch cows; three (3) heifers coming two years old; one (1) registered Holstein Bull; five (5) head of calves six months old; all dairy equipment including Empire Mechanical Milker and gasoline engine; two (2) road wagons; one (1) milk wagon, plow, harrows, and all other machinery now on said farm, three (3) head of work horses, one thousand dollars ($1,000.00) worth of stock in a Percheron Stallion named “Impotent” and two (2) sets of work harness (Monongalia County Deeds 1920).

The deed also referenced a silo on the property, which predated the two ca. 1954 silos located there currently. The following year, Mabel Student sold the 126-acre property to George Yuhost and Howard Jenkins and made reference to additional farm equipment—two mowing machines, one hay fork, plows, cultivators, one grain drill, and one corn drill—in the deed (Monongalia County Deeds 1921).

Howard Jenkins and his wife Goldie Pearl Jenkins lived on the dairy farm with their children through the 1930s and 1940s (US Census 1930 and 1940). Beginning ca. 1940, the concrete block outbuilding and the frame secondary dwelling were added to the property. Ca. 1948, a concrete block dairy barn with milkhouse and a smaller frame barn were constructed; it is assumed that they replaced earlier barns and outbuildings. Ca. 1954, two concrete stave silos were erected between the two barns.

The former Bunner Home Farm continued to operate as a dairy farm under Jenkins, though by the early 1940s, sections of the farm began to be parceled off for sale. After the construction of Greenbag Road in the mid-1960s, which replaced a narrow rural road by excavating a slightly revised path at the current north edge of the farm parcel, the trend to make more of the former farmland available for development continued. The farm is currently surrounded by suburban development with non-historic church properties located to the south, west, and northwest; individual residences located to the west and north; a residential development located to the north; and commercial development located to the northwest, northeast, and east.

The Campbell Farmhouse is recommended as eligible for listing in the National Register of Historic Places (NRHP) under Criterion C for Architecture as an intact and evocative example of an Italianate farmhouse. The larger farm property was evaluated under Criterion A for Agriculture, but it failed to convey a sense of its historic appearance and production as a late 19th/early 20th century dairy farm. None of the Campbells, Bunners, and the Jenkinses appear to meet the requirements for significance under Criterion B. The property was not evaluated under Criterion D for its potential to provide information important to the understanding of history or prehistory.

The recommended National Register boundary for the Campbell Farmhouse relies on natural and manmade features to provide an appropriate context for the Italianate dwelling that includes substantial farmland within its 10.9-acre area as well as the numerous mid-20th century outbuildings that are part of the farmhouse's setting even though they do not contribute to its significance. The boundary begins on the north side following the top of the embankment above Greenbag Road that was created during the excavation and construction of the road in the mid-1960s; this embankment varies in height from roughly ten to seventeen feet. The top of the embankment is lined with trees, and its elevation obscures views of the roadway below. To the east and south, the recommended boundary follows the meandering path of Aaron Creek and its unnamed tributary, and to the west the boundary follows the driveway leading from Greenbag Road to the Covenant Evangelical Methodist Church.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Campbell Farmhouse **SITE#** MG-2641

The recommended period of significance for the property is ca. 1886 to represent the period when the Italianate farmhouse was built.

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Monongalia County Deeds
1978 Goldie Pearl Jenkins to Ray C. and Phyllis E. Jenkins. Deed Book 804, Page 135. On file, Monongalia County Clerk of Courts, Morgantown, West Virginia.

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2017 Last Will and Testament of Phyliis E. Jenkins. Will Book 171, Page 53. On file, Monongalia County Clerk of Courts, Morgantown, West Virginia.

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Campbell Farmhouse** **SITE#** **MG-2641**

United States Bureau of the Census (US Census) (continued)

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Campbell Farmhouse **SITE#** MG-2641



Photograph 1. North and west (front) elevations of the Campbell Farmhouse, facing southeast.



Photograph 2. South (side) elevation of the farmhouse, facing north.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Campbell Farmhouse **SITE#** MG-2641



Photograph 3. View of Campbell Farmhouse rear elevation in the distance, facing northwest.



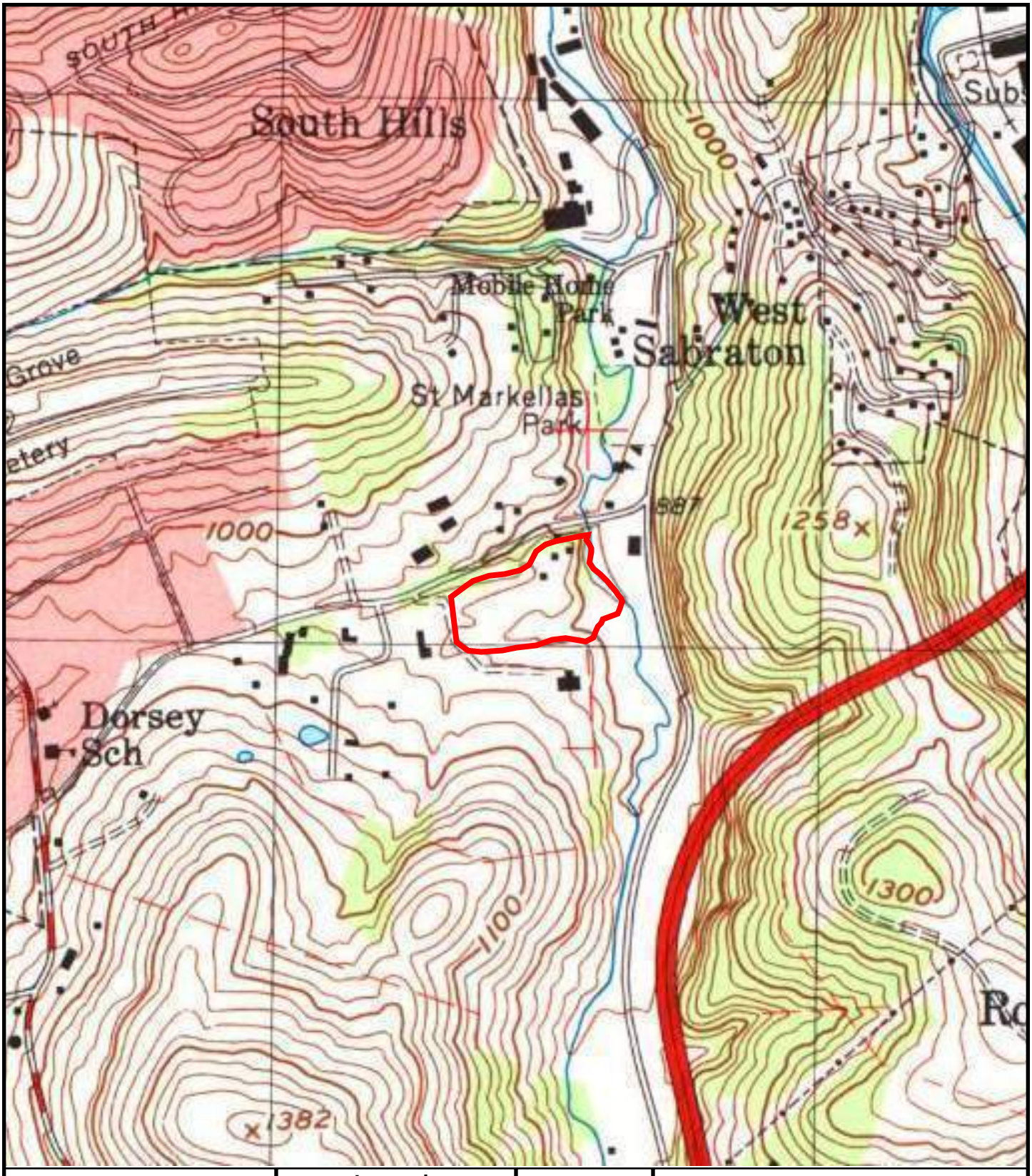
Photograph 4. Ca. 1940 secondary dwelling at left, ca. 1948 dairy barn at center with two ca. 1954 silos behind, and ca. 1948 barn screened from view, facing northeast.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Campbell Farmhouse **SITE#** MG-2641



Photograph 5. West (side) elevation of ca. 1940 outbuilding, facing east.



Feet
0 750 1,500

Legend
Recommended National Register Boundary

N
W E
S

USGS Map
MG-2641
Campbell Farmhouse

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Recommended National Register Boundary

N
W E
S

Site Map
MG-2641
Campbell Farmhouse

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2019



*Not to scale

Legend

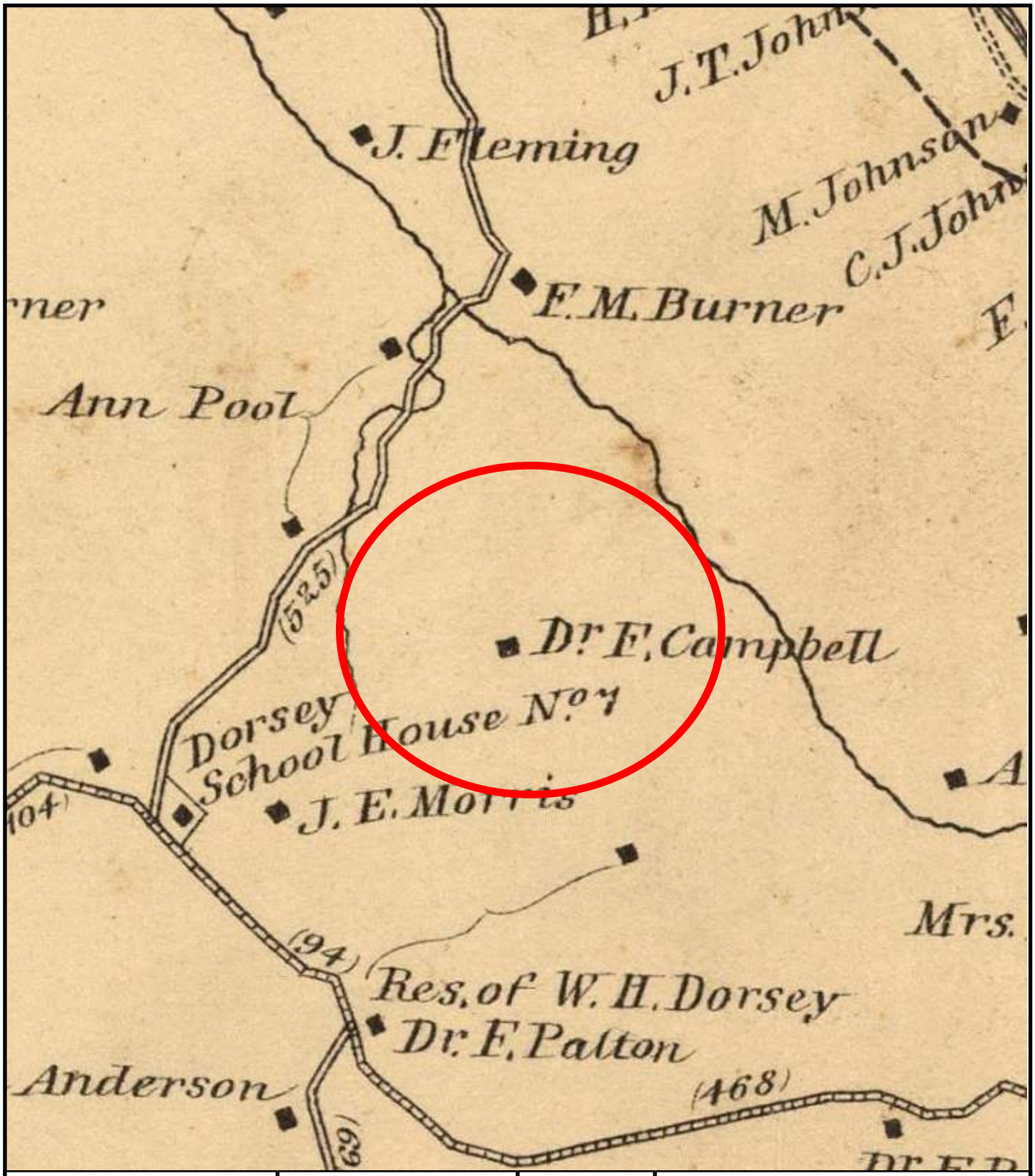
N
W E
S

Site Map
MG-2641
Detail of the Campbell Farmhouse

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2019



*Not to scale	**Legend** Approximate Resource Location		**1886 Map Detail** MG-2641 Campbell Farmhouse
MARKOSKY	Greenbag Road Improvement Project		Morgan District and City of Morgantown Monongalia County ***Source: Lathrop et al. 1886***



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 851 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ House at 851 Greenbag Road	**Field Survey #**	**Site # *(SHPO Only)*** MG-2642
Town or Community Morgantown vicinity	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** c. 1970	**Style** Ranch	
Exterior Siding/Materials Brick	**Roofing Material** Tile - Ceramic	**Foundation** Concrete - Block (assumed)	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 591409 E / 4385210 N	 Photograph 1. MG-2642 / House at 851 Greenbag Road, west and south (front) elevations, facing northeast	
Survey Organization & Date The Markosky Engineering Group, October 31, 2019	**Quadrangle Name** Morgantown South, WV		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
MG-2642
249

N

Present Owners
Fred W. Westerman

Phone #

Owners Mailing Address
851 Greenbag Road
Morgantown, WV 26505

Describe Setting

The house is located in a suburban area to the southeast of the Morgantown city limits. The recent (post-2000) nearby development of a commercial warehouse complex (to the west) and a townhome residential plan (to the east) occupy former farmland.

3.25 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 5 **Front Bays**

One-story hipped roof ranch residence with partially-exposed basement level featuring an integral two-car garage. Porches added to the front, side, and rear elevations ca. 2010.

(Use Continuation Sheets)

Alterations

○ **Yes** ◉ **No**

If yes, describe

Additions

◉ **Yes** ○ **No**

If yes, describe

One-bay front porch added ca. 2010; three-season rear enclosed porch added ca. 2010; and lower level side porch added ca. 2010

Describe All Outbuildings

Detached garage/workshop from ca. 1970 located to the northeast of the house

(Use Continuation Sheets)

Statement of Significance

The House at 851 Greenbag Road represents an unremarkable example of a common house type from the postwar era (ca. 1970). It does not appear to be associated with any significant events; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

(Use Continuation Sheets)

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(Use Continuation Sheets)

Form Prepared By: Laura C. Ricketts **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME House at 851 Greenbag Road **SITE#** MG-2642



Photograph 1. MG-2642 / Ranch at 851 Greenbag Road, west and south (front) elevations, facing northeast



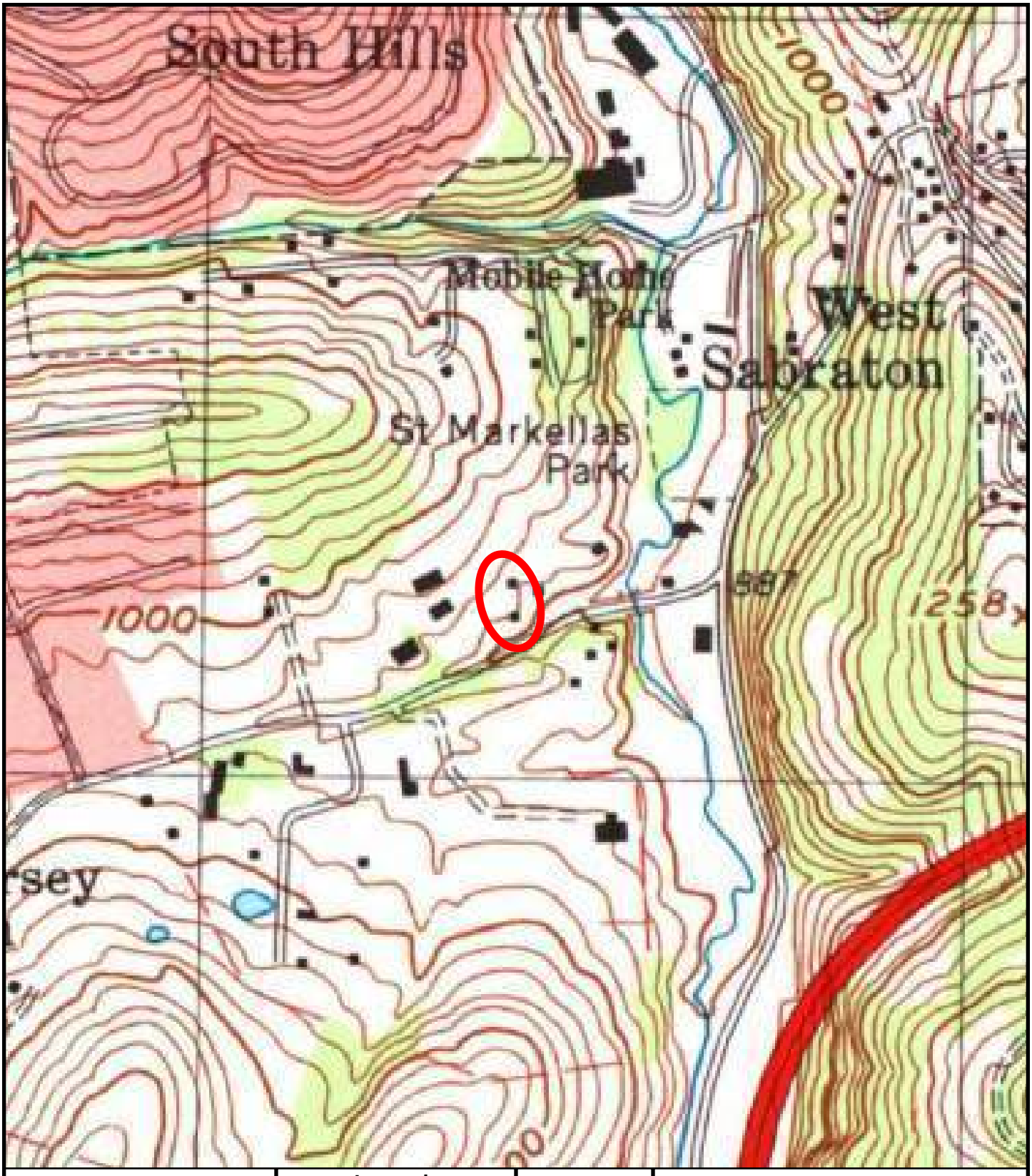
Photograph 2. MG-2642 / Ranch at 851 Greenbag Road, east and north (rear) elevations, facing southwest

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 851 Greenbag Road **SITE#** MG-2642



Photograph 3. View of detached garage at left, facing northwest. The non-historic buildings to the right belong to an unrelated property.



Feet
0 500 1,000

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2642
House at 851 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale	**Legend** Approximate Parcel Boundary	N W E S	**Site Map** MG-2642 House at 851 Greenbag Road
MARKOSKY	Greenbag Road Improvement Project		Morgan District and City of Morgantown Monongalia County ***Source: Google Earth 2019***



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 5000 Greenbag Road	**Common/Historic Name/Both** ○ ○ ◉ Mountaineer Mall	**Field Survey #**	**Site # *(SHPO Only)*** MG-2643
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder Dill Construction Company (Latrobe, PA)	**Date of Construction** 1974	**Style** Late 20th Century Commercial	
Exterior Siding/Materials Brick, Metal - Aluminum, Concrete - Block	**Roofing Material** Unknown	**Foundation** Unknown	
Property Use or Function **Residence** ○ **Commercial** ◉ **Other** ○	**UTM#** 17 S 589228 E / 4384521 N	 Photograph 1. MG-2643 / Mountaineer Mall, overview, facing southwest	
Survey Organization & Date The Markosky Engineering Group, February 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvements/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2643

Site No.

N

Present Owners
GP-Mountaineer LLC

Phone #

Owners Mailing Address
610 Old York Road
Jenkintown, PA 19046

Describe Setting
See continuation sheet.

78 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present)

1 **Stories** _____ **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations

◉ **Yes** ○ **No**

If yes, describe
See continuation sheet.

Additions

◉ **Yes** ○ **No**

If yes, describe
See continuation sheet.

Describe All Outbuildings
None.

(Use Continuation Sheets)

Statement of Significance
See continuation sheet.

(Use Continuation Sheets)

Bibliographical References
See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group
Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Mountaineer Mall **SITE#** MG-2643

MG-2643 / Mountaineer Mall is located on the south side of Greenbag Road and east of Route 119 on a bluff above the Monongahela River. The shopping mall is surrounded by wooded areas as well as commercial and industrial buildings, the majority of which were built after construction of the mall was completed. The mall is located approximately 1.66 miles southwest of Morgantown.

The Mountaineer Mall, an approximately 500,000 square foot steel frame enclosed shopping center, was constructed in 1974 by Dill Construction Company of Latrobe, Pennsylvania (Morgantown Dominion-Post 1974) (Photographs 1-9). The original architect of the mall is presently unknown. Its original footprint was a long, roughly rectangular shape with small asymmetrical projections on each elevation. The shopping mall is covered in stretcher bond brick, aluminum panels and tiles, and smooth and rock faced concrete block in portions of the rear (southeast) elevation. The mall features multiple entrances, each with a variation of a Post Modern projecting semi-circular arched entryway that likely dates from the ca. 1987 additions and updates to building. The ca. 1987 addition projects from the northwest elevation of the mall.

The present main entrance to the mall is located on the northwest corner of the ca. 1987 addition. The angled entrance leads to a wide walkway that travels diagonally through the double height addition. Interior materials include terrazzo floors, glazed brick and tile pilasters decorating the walls, and brick veneer applied to some walls. The interior is decorated with simple free standing wood planters along with L-shaped and triangular planters covered in white tile. Decorative domed recessed lighting with simulated leading is located in the center of the addition. The addition is connected to the original portion of the mall by a terraced walkway flanked by steps featuring a wood handrail with brass railings. Clerestory windows are located above the central cross axis of the original 1974 section of the mall. The 1974 section is organized along a wide double loaded corridor with a secondary perpendicular walkway providing access to some of the shopping mall's original anchor tenants at the center of the complex. The northeast and southwest sections of the mall which originally housed anchor stores now function as office space.

The Mountaineer Mall brought the first large-scale, air conditioned multi-store shopping center to northern West Virginia (Latrobe Bulletin 1974). Laurel of Morgantown, a subsidiary of the Laurel Development Company of Latrobe, Pennsylvania, was responsible for the development of the 75 store mall whose anchor stores included Montgomery Ward, J.C. Penney, G.C. Murphy, and a Giant Eagle grocery store. The mall was constructed by Dill Construction Company of Latrobe, Pennsylvania and was financed by Equibank N.A. of Pittsburgh, which had also financed two large scale hotels near Morgantown and an extended care nursing facility near the West Virginia University Hospital (Morgantown Dominion-Post 1974; Latrobe Bulletin 1974). The Mountaineer Mall saw its peak in the late 1970s and into the early 1980s. In 1990, however, the Morgantown Mall was opened nearby on the west side of the Monongahela River with direct access to Interstate 79 roughly two and half miles northwest of the Mountaineer Mall. Mountaineer Mall immediately lost one of its anchor stores when J.C. Penney relocated to the

Morgantown Mall shortly after it opened. As more retailers left the mall in the late 1990s and into the first decade of the 2000s, the mall began to lease space for offices. Current tenants include Fresenius Kidney Care, Mylan, TeleTech, Focus Mon Learning Center, and Mountaineer Home Medical, as well as other retail and non-retail tenants (Way 2010).

No information was recovered linking the Mountaineer Mall to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the mall was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. Mountaineer Mall stands as a common and unexceptional example of late mid-century commercial architecture and construction technique. The mall was constructed by Dill Construction Company of Latrobe, Pennsylvania. However, the company was a small firm operating primarily in southwestern Pennsylvania and the mall is not a noteworthy example of the company's work. The mall has also undergone a loss of integrity due to a major addition, the removal of original interior decorative material, and alterations to original entrances in 1987. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Mountaineer Mall** **SITE#** **MG-2643**

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Mountaineer Mall **SITE#** MG-2643



Photograph 1. Overview, facing southwest (Markosky 2019-01-29)



Photograph 2. Overview, facing south (Markosky 2019-01-29)



Photograph 3. Rear of mall, facing northeast (Markosky 2019-01-29)



Photograph 4. Rear of mall, facing east (Markosky 2019-01-29)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

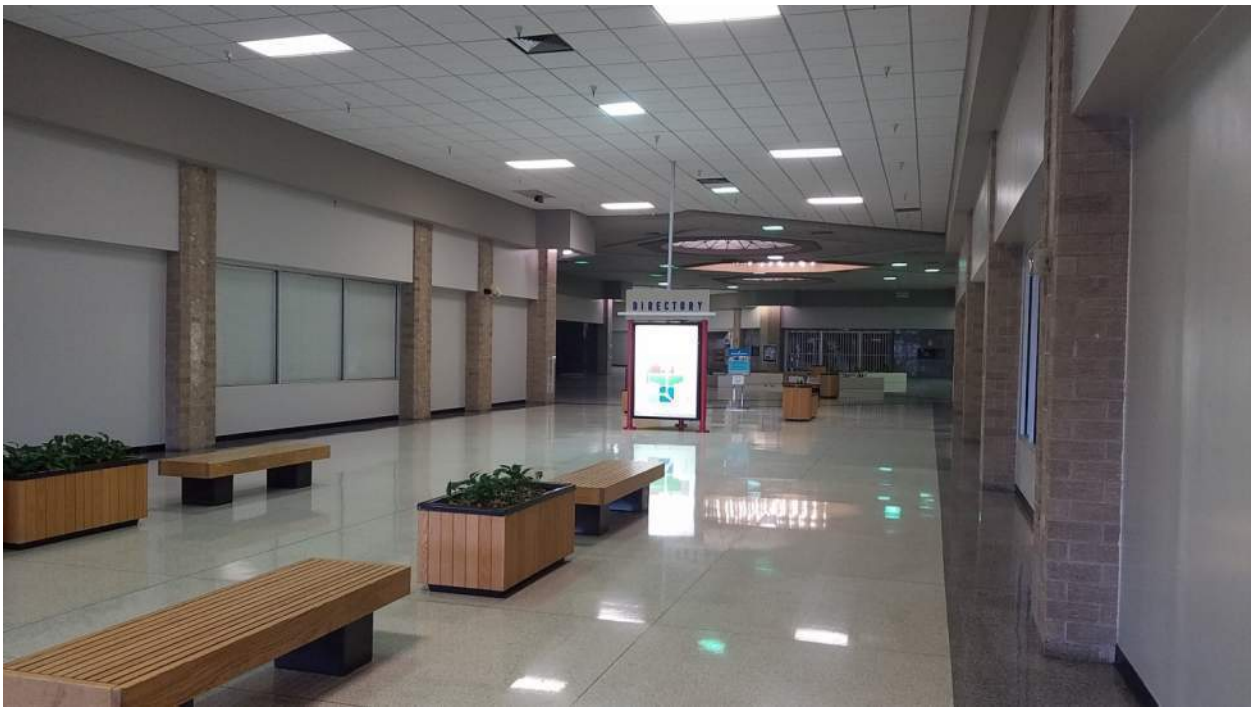
NAME Mountaineer Mall **SITE#** MG-2643



Photograph 5. Representative entrance, facing southwest (Markosky 2019-01-29)



Photograph 6. Mall half domed entrance in ca. 1987 addition, facing east (Markosky 2019-03-20)



Photograph 7. Terrazzo floor, glazed brick pilasters, and planters (Markosky 2019-03-20)



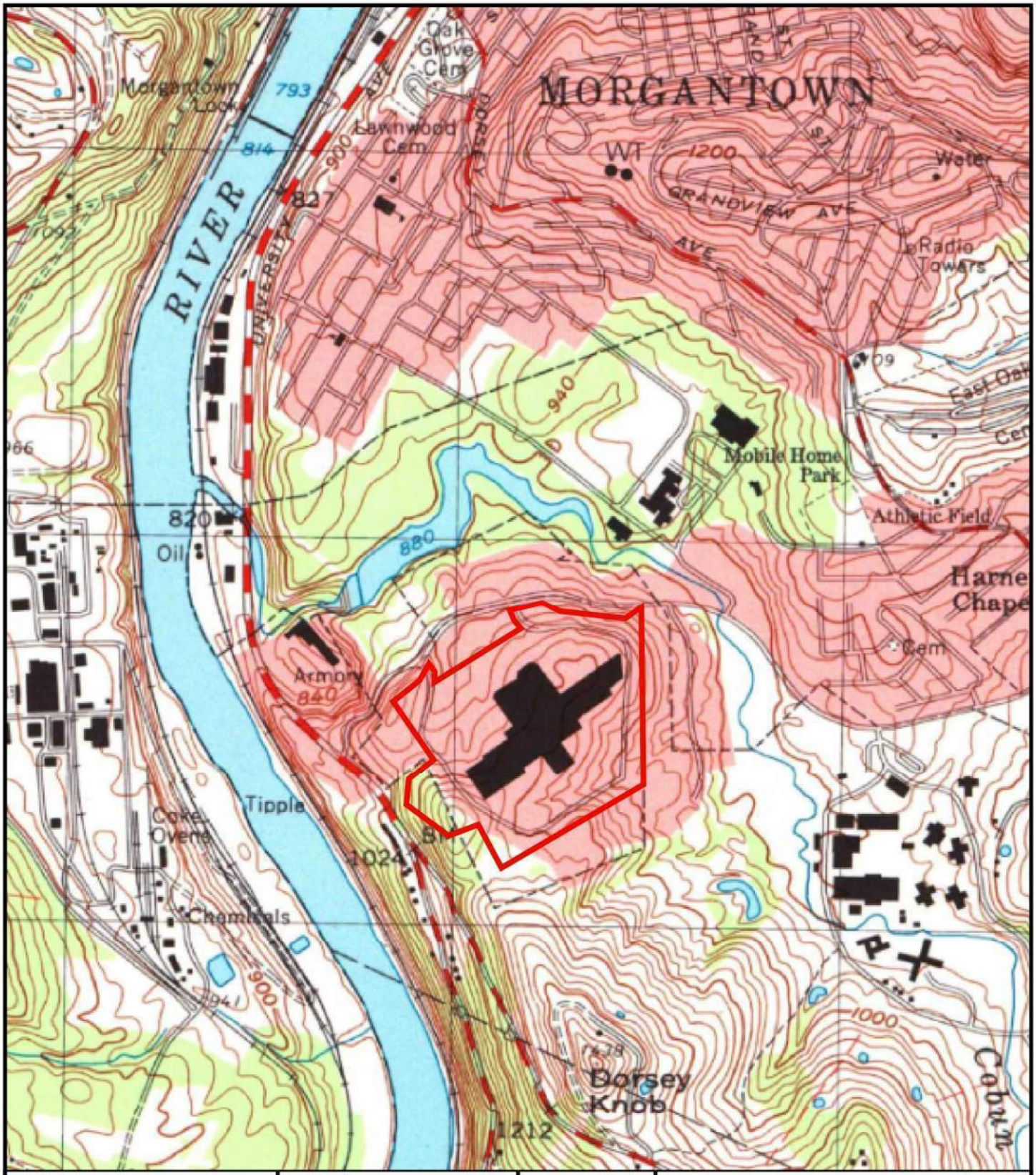
Photograph 8. Terraced walkway leading to original 1974 portion of mall (Markosky 2019-03-20)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Mountaineer Mall** **SITE#** **MG-2643**



Photograph 9. Central open area in 1974 portion showing planters, brick veneer on walls, and clerestory windows (Markosky 2019-03-20)



Feet	Legend		USGS Map
0 500 1,500	Location of Historic Structure	N W E S	MG-2643 Mountaineer Mall 5000 Greenbag Road
MARKOSKY	Greenbag Road Improvement Project		Morgan District and City of Morgantown Monongalia County *Source: USGS 1997*



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2643
Mountaineer Mall
5000 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Aerial View in 1976
MG-2643
Mountaineer Mall
5000 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1976



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 2020 Mississippi Street	**Common/Historic Name/Both** ○ ○ ◉ Morgantown City Garage	**Field Survey #**	**Site # *(SHPO Only)*** MG-2644
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder Mellon-Stuart Company of Pittsburgh, PA	**Date of Construction** 1975-1976	**Style** Modern Garage/Shed	
Exterior Siding/Materials Metal - Aluminum	**Roofing Material** Metal - Aluminum	**Foundation** Concrete - Block	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉	**UTM#** 17 S 589737 / 4384935	 Photograph 1. MG-2644 / Morgantown City Garage, southwest and southeast elevations, facing north	
Survey Organization & Date The Markosky Engineering Group, February 5, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
449
MG-2644

N

Present Owners	Owners Mailing Address
City of Morgantown Phone #	389 Spruce Street Morgantown, WV 26505

Describe Setting

See continuation sheet.

41 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 6 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Morgantown City Garage **SITE#** MG-2644

The Morgantown City Garage complex is located on the northeast side of Mississippi Street approximately 384 feet north of its intersection with Greenbag Road. The building, which was constructed between 1975 and 1976, is set within an area of commercial and residential development approximately 1.39 miles south of the city of Morgantown.

The Morgantown City Garage was constructed between 1975 and 1976 by the Mellon-Stuart Company of Pittsburgh, Pennsylvania (Photographs 1-3 [Morgantown Dominion Post 1975a, 1975b, and 1976]). The steel frame pole barn is covered in ridged metal cladding. The structure is capped by a low-pitched side gable roof covered in standing seam metal roofing. The front (southwest) elevation of the garage features four oversized vehicle-bay openings. Fenestration consists of fixed windows.

A ca. 1975 barrel vaulted, prefabricated storage outbuilding set atop concrete blocks is located west of the garage. A ca. 2000 storage barn resting on a poured concrete foundation is located northwest of the garage. The storage barn is covered in vertical siding and capped by a front gable roof covered in asphalt shingle. Four additional outbuildings dating to ca. 1995 are located northwest of the garage; however, they were not visible from the public right-of-way (ROW).

No information was recovered linking the Morgantown City Garage to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the building was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Morgantown City Garage was constructed by the Mellon-Stuart Company of Pittsburgh, Pennsylvania (Morgantown Dominion Post 1975a, 1975b, and 1976). The company was incorporated in 1917 and represented the merging of two Pittsburgh construction companies, one of which was owned by local financier Thomas Mellon. While the company specialized in railroad related construction, it was responsible for the construction of many notable office buildings in downtown Pittsburgh. The company is considered one of the oldest continually operating construction companies in the United States (Funding Universe 2019). However, the Morgantown City Garage does not represent a noteworthy example of the company's work. The Morgantown City Garage stands as a common and unexceptional example of a late mid-century outbuilding. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Morgantown City Garage **SITE#** MG-2644

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1975b "Garage 38% Complete." *Morgantown Dominion-Post*. December 18, 1975, page 2B.

1976 "The New City Garage." *Morgantown Dominion-Post*. August 5, 1976, page 6B.

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1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Morgantown City Garage **SITE#** MG-2644



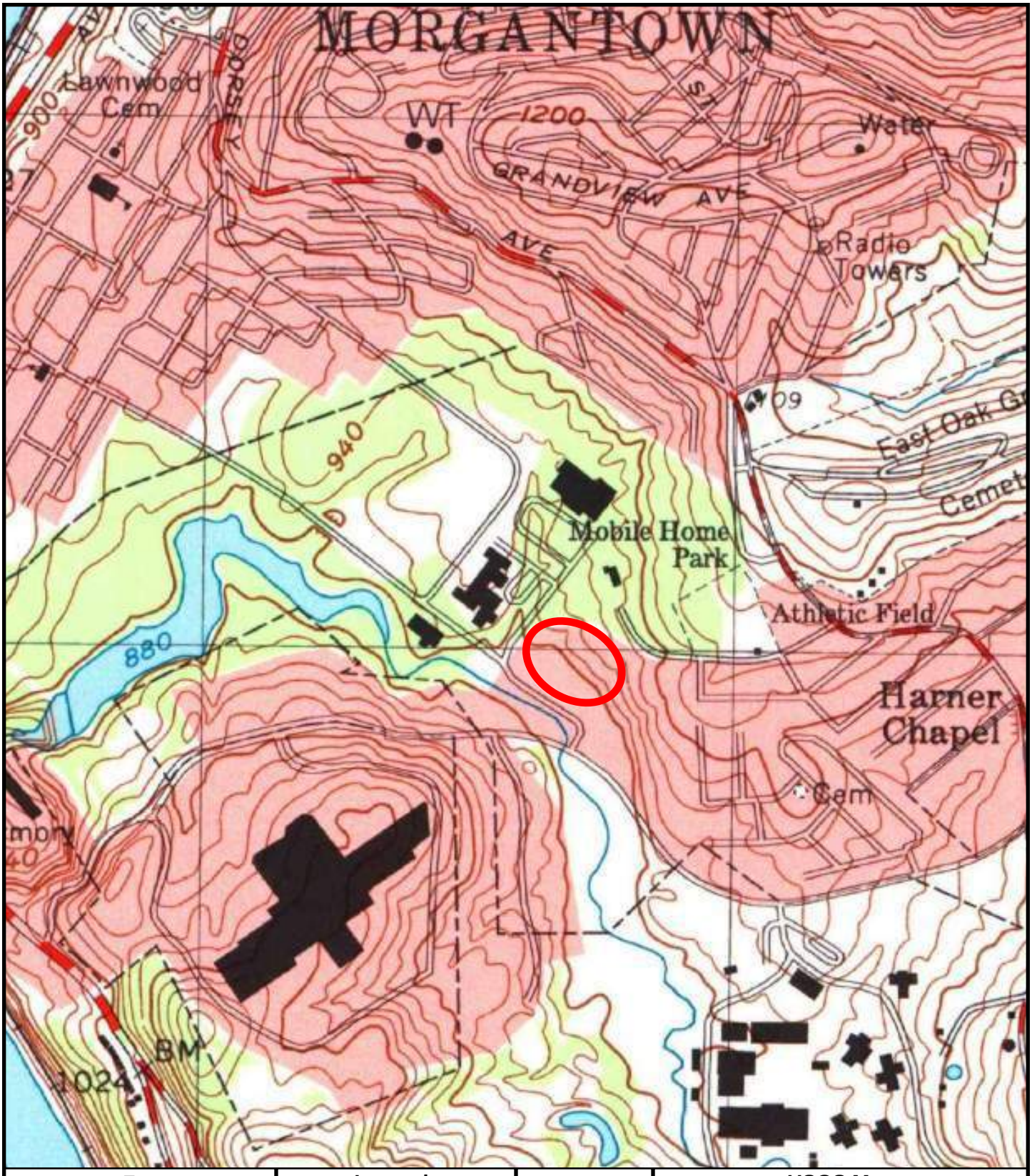
Photograph 1. Southwest and southeast elevations, facing north (Markosky 2019-02-05)



Photograph 2. Prefabricated outbuilding, facing southeast (Markosky 2019-02-05)



Photograph 3. Non-historic storage barn, facing southeast (Markosky 2019-02-05)



Feet

0 500 1,500

Legend

Location of Historic Structure

N

W E

S

USGS Map
MG-2644
Morgantown City Garage
2020 Mississippi Street

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale	**Legend** Approximate Parcel Boundary	N W E S	**Site Map** MG-2644 Morgantown City Garage 2020 Mississippi Street
MARKOSKY	Greenbag Road Improvement Project		Morgan District and City of Morgantown Monongalia County ***Source: Google Earth 2018***



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 446 Greenbag Road	**Common/Historic Name/Both** ○ ○ ◉ FCI Morgantown Kennedy Center / Robert F. Kennedy Youth Center	**Field Survey #**	**Site # *(SHPO Only)*** MG-2645
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder C.E. Silling & Associates; Schmidt, Garden & Erickson	**Date of Construction** 1968	**Style** Modern; Ranch	
Exterior Siding/Materials Brick	**Roofing Material** Asphalt - shingles	**Foundation** Not visible	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉	**UTM#** 17 S 590139 / 4384373	 Photograph 1. MG-2645 / Robert F. Kennedy Youth Center, overview, facing southeast	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvements/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2645

Site No.

N

Present Owners
United States Federal Bureau of Prisons

Phone #

Owners Mailing Address

Describe Setting
See continuation sheet.

103 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) _____**Stories** _____**Front Bays**
See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ○ **No** **If yes, describe**
The buildings within the complex were not accessible during field survey.

Additions ○ **Yes** ○ **No** **If yes, describe**
The buildings within the complex were not accessible during field survey.

Describe All Outbuildings
Not visible during field survey.

(Use Continuation Sheets)

Statement of Significance
See continuation sheet.

(Use Continuation Sheets)

Bibliographical References
See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group
Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME FCI Morgantown Kennedy Center/RFK Youth Center **SITE#** MG-2645

MG-2645 / Robert F. Kennedy Youth Center is an approximately 103-acre federal correctional institution complex located on the south side of Greenbag Road west of Kingwood Pike. The complex is located approximately 1.68 miles southeast of the city of Morgantown and is surrounded by dense woods to the south and east, while a collection of large commercial and industrial buildings are located to the west. As the complex is a functioning correctional institution, the buildings were not accessible during field survey.

The complex was constructed in 1968 and includes approximately 18 buildings. It currently functions as a minimum security Federal Correctional Institution (Photographs 1-7). The entrance of the complex features a sign made of brick piers; the area fronting Greenbag Road is delineated by a simple wood post fence. The buildings visible from the public right-of-way are one-story Ranch style buildings clad in polychrome brick with a frame structural system. The roof profiles include low pitched hipped roofs covered in asphalt shingle with overhanging eaves. The majority of the buildings in the complex are rectangular in plan with projecting wings. A 1968 article in the Morgantown Dominion News shows a photograph of a mid-century Modern building although its use was not disclosed. The building, which appears to be a focal point within the complex, is clad in stone veneer and features a stylized hyperbolic-type roof (Morgantown Dominion News 1968). The Robert F. Kennedy Youth Center was built in a campus style. The complex is surrounded by a driveway and has paved walking paths that connect the various buildings. Cobun Creek passes through the southern portion of the complex, and three footbridges carry the walking paths over the creek. The complex includes tennis courts and a baseball field. A review of modern aerial photographs indicates that two additional buildings were constructed in the southern section of the complex ca. 1997.

The Robert F. Kennedy Youth Center was constructed in 1968 using designs by C.E. Silling and Associates (known today as Silling Architects) from Charleston, West Virginia (Balchen 1971:13). The firm is the oldest continually operating architectural firm in West Virginia (Silling Architects 2018). Construction and planning was overseen by Gary Mote, who at the time was the principal architect with the Office of Facilities Development Division of the Federal Bureau of Prisons (Balchen 1971:15). According to a 1968 article in the Morgantown Dominion News, at the time the facility was dedicated the grounds included a large educational facility which housed classrooms, an auditorium, and an indoor swimming pool (Morgantown Dominion News 1968).

The facility was designed as a prototype for the experimental penal system model known as “unit management” and was considered a model for other correctional systems projects (Kasey 2015:51; Balchen 1971:15). In the unit management model, the juvenile offenders were put into groups of 50-200 and were managed by a multidisciplinary team. At the Robert F. Kennedy Youth Center, the juvenile offenders were referred to as students. The eventual goal was to “graduate” each student from the facility. The staff was to be available and approachable, and open communication between students and staff was encouraged. The housing units were referred to as cottages, and there were no fences or bars within the facility (Kasey 2015:51; Balchen 1971:15).

This experimental model resulted in reduced violence among inmates, reduced program costs, increased morale among inmates and staff, and lower recidivism rates, and it generally produced inmates who were better prepared to reenter society. Within a decade of its opening, the facility was transitioned to house adult male inmates and the unit management model was eventually adopted in prisons throughout the country (Kasey 2015:51; Balchen 1971:15). Today, the facility is known as the Morgantown Kennedy Center Federal Correctional Institution, and it houses non-violent offenders, the majority of which have committed crimes related to financial fraud.

The Robert F. Kennedy Youth Center is significant for its association with the penal history of the United States. The center was constructed as an experimental juvenile detention center employing the “unit management” penal system model. The model was considered a success and was eventually applied to adult correctional institutions across the United States. The website of the Federal Bureau of Prisons includes a historical timeline outlining significant events related to United States prisons beginning in 1891 when the Federal Prison System was established. The opening of the Robert F. Kennedy Youth Center in 1969 is included on this timeline; the center is recognized for the innovative concepts and programs it implemented. The establishment of the center represents a significant moment in the institutional history of the Federal Bureau of Prisons (Federal Bureau of Prisons 2018). For these reasons, the Robert F. Kenney Youth Center is eligible for NRHP listing under Criterion A. No information was recovered linking the prison to individuals significant on the local, state, or national level. Therefore, the complex is not eligible for NRHP listing under Criterion B.

The Robert F. Kennedy Youth Center was designed by C.E. Silling and Associates. The firm is known today as Silling Architects and is the oldest continually operating architectural firm in West Virginia. The firm designed numerous buildings in West Virginia including the Huntingdon County Federal Building; the Boone County Courthouse; Charleston City Hall; Nicholas County High School; the State Masonic Home in Parkersburg; the West Virginia Cultural Center in Charleston; the Medium Security Prison in Huttonsville; and the Mountainlair Student Union and Coliseum Arena at West Virginia University in Morgantown. Residential examples of the firms work are located in the Edgewood, South Hills, and Kanawha City neighborhoods of Charleston. The firm also designed public housing projects in Charleston as well as the Stadium Terrace development in Mt. Hope. The firm was well known in West Virginia for their projects which included academic buildings, health care facilities, prisons, airports, courthouses, and banks (Gioulis 2011:3). However, because the complex was not accessible during field survey there is not enough information to inform the significance or integrity of the architectural design. Eligibility under Criterion C is not able to be determined. The complex has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **FCI Morgantown Kennedy Center/RFK Youth Center** **SITE#** **MG-2645**

References

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Gioulis, Michael
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1968 "Youth Center Will Be Named in Robert Kennedy's Honor." *Morgantown Dominion News.* November 12, 1968, page 1B, column 1-3.

Silling Associates
2018 "Our Company." Website at http://silling.com/our-company/. Accessed December 14, 2018.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME FCI Morgantown Kennedy Center/RFK Youth Center **SITE#** MG-2645



Photograph 1. Entrance sign and wood post fencing south of Greenbag Road, facing southeast (Markosky 2018-12-04)



Photograph 2. Overview from Greenbag Road, facing southeast (Markosky 2018-12-04)



Photograph 3. Overview from Kingwood Pike, facing west (Markosky 2019-02-05)



Photograph 4. Representative building, facing west (Markosky 2019-02-05)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

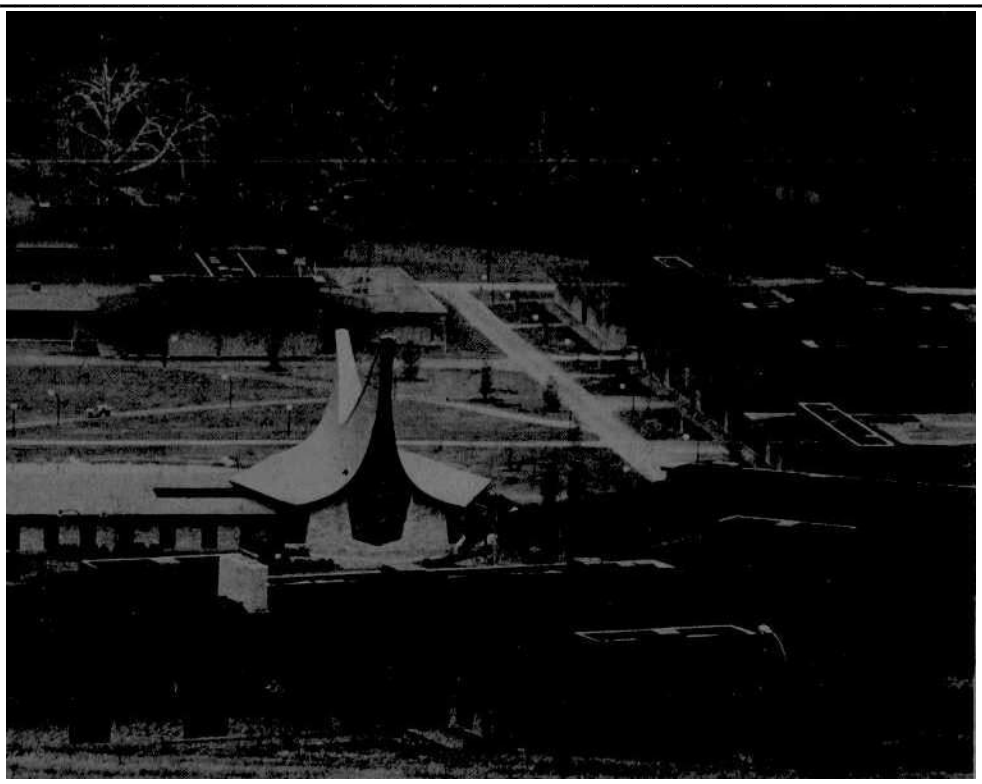
NAME FCI Morgantown Kennedy Center/RFK Youth Center **SITE#** MG-2645



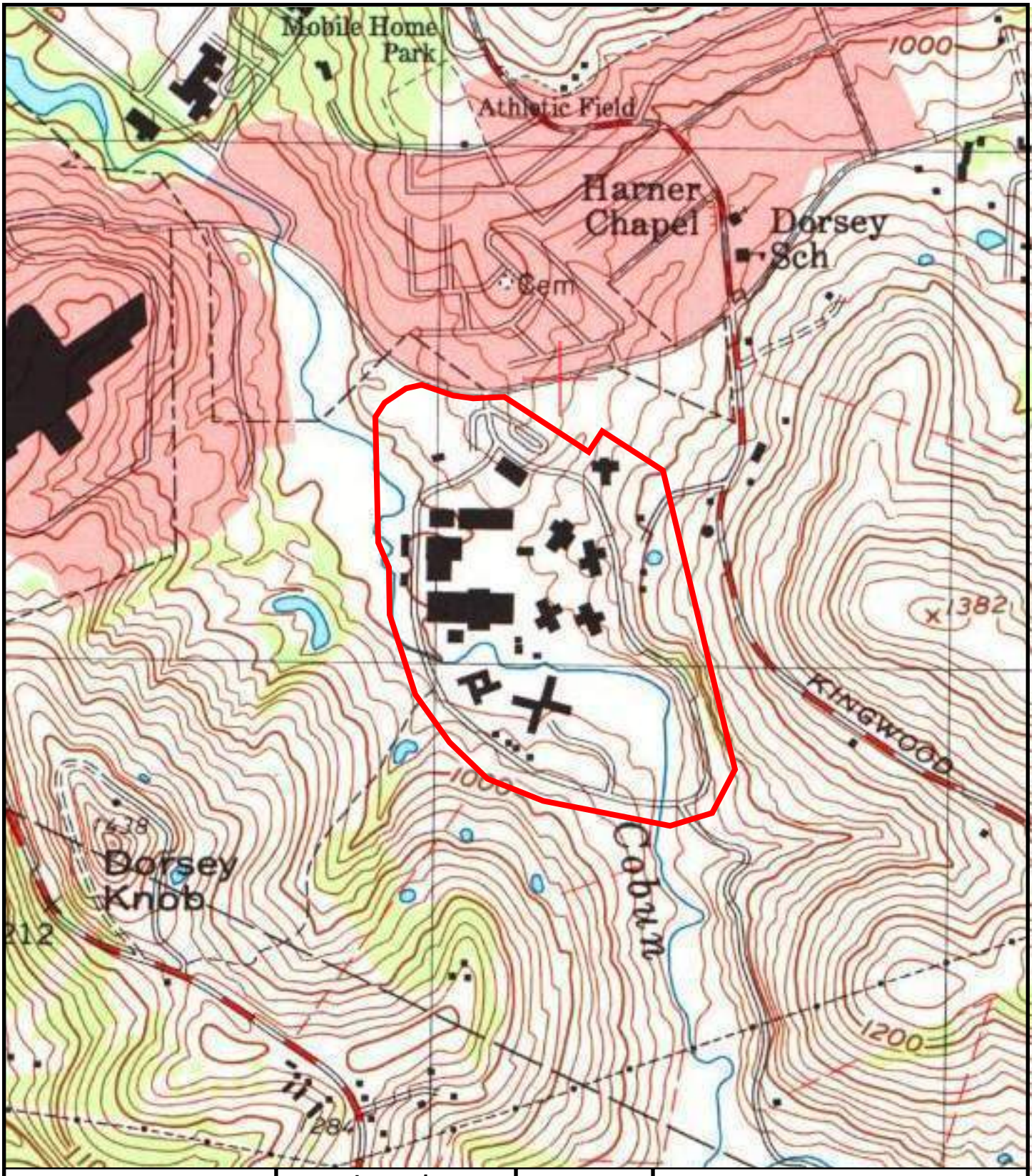
Photograph 5. Representative building south of Greenbag Road, facing south (Markosky 2018-12-04)



Photograph 6. Representative building from FCI Morgantown website (Federal Bureau of Prisons 2018b)



Photograph 7. Photograph of representative building with hyperbolic-type roof (Morgantown Dominion News 1968)



Feet
0 750 1,500

Legend
Recommended National Register Boundary

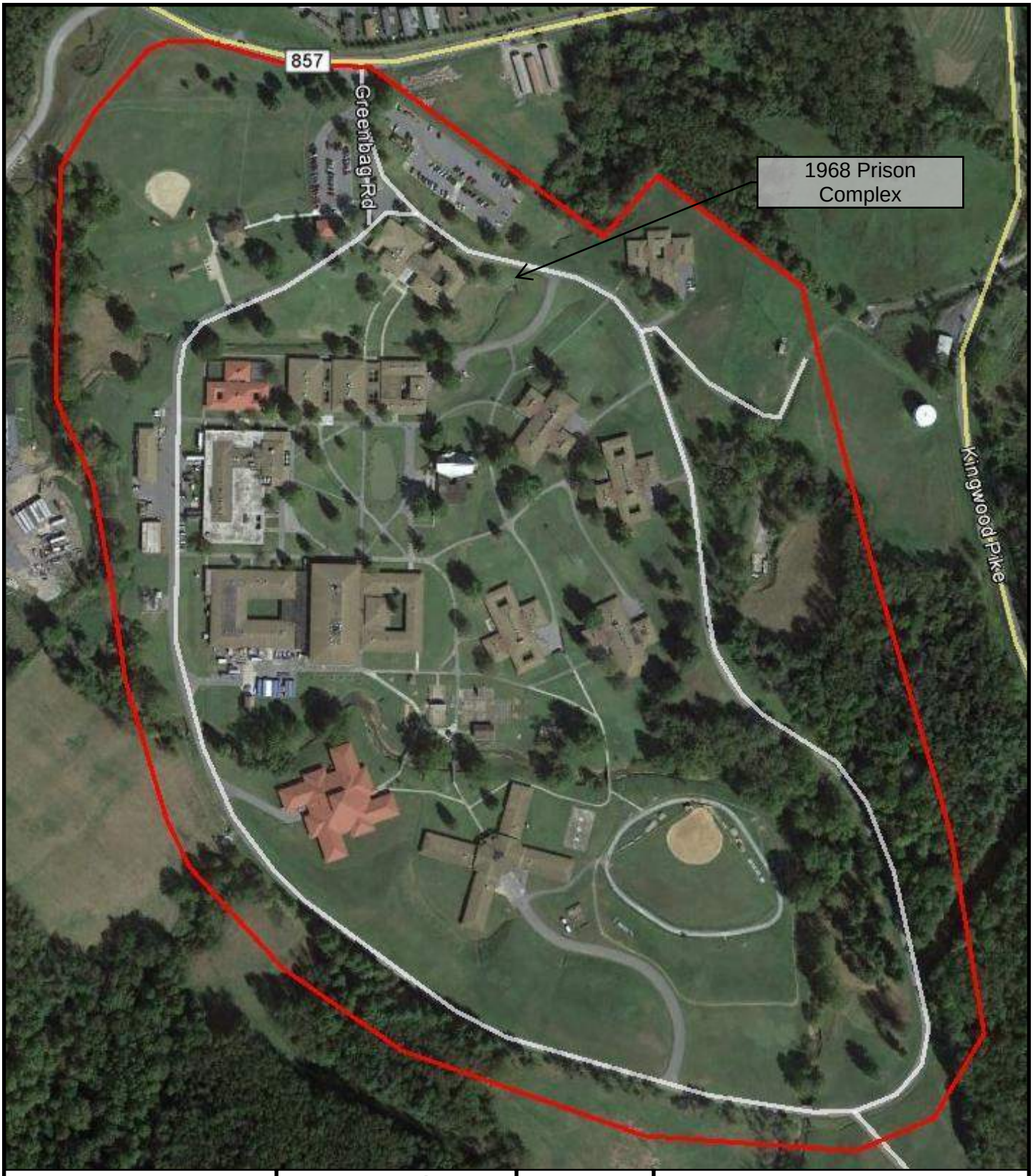
N
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USGS Map
MG-2645
Robert F. Kennedy Youth Center

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Recommended National Register Boundary

N
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S

Site Map
MG-2645
Robert F. Kennedy Youth Center

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



*Not to scale

Legend
Recommended National Register Boundary

N
W E
S

Aerial View in 1976
MG-2645
Robert F. Kennedy Youth Center

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1976



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 87 Kingwood Pike	**Common/Historic Name/Both** ○ ◉ ○ Patton Farm	**Field Survey #**	**Site # *(SHPO Only)*** MG-2646
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1880	**Style** Other	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Metal - Standing Seam	**Foundation** Stone - Coursed Rubble	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590604 / 4384361	 Photograph 1. MG-2646 / Patton Farm, farmhouse, facing northeast	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2646

Site No.

N

Present Owners	Owners Mailing Address
Samuel Dewey Hastings Phone #	P.O. Box 172, Morgantown, WV 26507

Describe Setting

See continuation sheet.

9.855 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2 **Stories** 3 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations

◉ **Yes** ○ **No**

If yes, describe

See continuation sheet.

Additions

◉ **Yes** ○ **No**

If yes, describe

See continuation sheet.

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Patton Farm **SITE#** MG-2646

MG-2646 / Patton Farm is located within an approximately 9.9 acre parcel on the east side of Kingwood Pike, approximately 0.21 miles south of its intersection with Greenbag Road. The surrounding area consists of dense woods to the east and south and an area of residential and commercial buildings to the north in the vicinity of Kingwood Pike and Greenbag Road.

The primary resource of the Patton Farm is a ca. 1880, two-story frame farmhouse (Photograph 1). The house is clad in vinyl siding and rests on a roughly coursed stone foundation. The three-gable roof is covered in standing seam metal and a two-story ell projects from the rear (southeast) elevation. Fenestration consists of replacement, metal sash one-over-one windows. Pairs of historic-era quarter round windows are extant in the gable ends. A hipped roof porch supported by square wood posts wraps around the façade (northwest elevation) and side (northeast elevation) of the farmhouse. The porch floor appears to be undergoing repairs.

Outbuildings on the property include a ca. 1880 root cellar located south of the farmhouse (Photograph 2). The root cellar is constructed of coursed stone and is capped by a front gable roof covered in corrugated metal with vertical board in the gable ends. A historic-era frame shed (Shed #1) is located to the northeast of the farmhouse (Photograph 3). The shed is clad in clapboard and capped by a front gable roof covered in standing seam metal. Another historic-era frame shed (Shed #2) is located to the northeast of Shed #1 (Photograph 3). The shed is clad in board and batten siding and is capped by a shed roof covered in corrugated metal with exposed rafter tails. A ca. 1980 pole barn clad in standing seam metal is located north of the farmhouse (Photograph 4). Another outbuilding that dates to ca. 1990 is located northeast of the pole barn but was not visible from the public right-of-way.

The Patton Farm is located within a parcel of land historically associated with George Dorsey, one of the earliest settlers in this area of Monongalia County. Dorsey came to the area in 1807 and acquired over 1,000 acres from Jonathan Coburn who had settled in the area in the late 18th century (Core 1976:379-381; Monongalia County Deeds 1803). Dorsey's Knob, a rock formation and tourist attraction since the late 19th century located approximately 0.87 miles to the southwest, was named for George Dorsey (Muttillo and Blosser 2018). George Dorsey died in 1824 and his land was deeded to his children, including his son George Dorsey, Jr. (Butcher 1912:873). The Patton Farm first appears on an 1886 map of Monongalia County (Figure 1) (Lothrop, et. al 1886). The house is identified as belonging to Dr. F. (Frederick) Patton, the husband of Eliza Patton, who was the daughter of George Dorsey Jr. (Butcher 1912:873).

The 1886 map shows dwellings scattered along the established roadways. The Dorsey School House No. 1 was located north of Dr. Patton's home at the intersection of the Kingwood, Morgantown, and West Union Turnpike (modern day Kingwood Pike) and modern day Luckey Lane. Morgantown was illustrated to the northwest. Dorsey's Knob is illustrated southwest of the Patton Farm and other members of the Dorsey family were living in the vicinity (Lothrop, et. al 1886).

In 1893, Frederick and Eliza Patton deeded 205 acres of land to Philip Fairchild Harner. The deed indicates the land was formerly from the estate of George Dorsey Sr. and a cemetery was

located on the property; the cemetery contained the graves of members of the Dorsey family and their servants (Monongalia County Deeds 1893). It is unclear if Philip Harner resided on the Patton Farm, as the 1900 population census indicates that he and his wife lived in the Greenmont area of Morgantown, which was to the north of the Patton Farm (US Census 1900). In 1902, Philip Harner conveyed the 205 acres to Jefferson and Virginia Smith (Monongalia County Deeds 1902). A 1902 topographic map shows the Patton Farm and the surrounding area (Figure 2) (USGS 1902). The Kingwood Pike was the major route throughout this area of Monongalia County. The few dwellings in the area were concentrated along this road as well as Luckey Lane. Dorsey Knob is again illustrated southwest of the Patton Farm. A large assemblage of oil storage tanks was located to the west of the Kingwood Pike and east of the Monongahela River. The tanks were constructed by the Eureka Pipeline Company, a subsidiary of the Standard Oil Company, in 1890. The tanks were used to store oil extracted throughout Monongalia County that was awaiting transport via pipelines (USGS 1902; Core 1982:144).

The 1910 population census lists Jefferson Smith as a 33 year old farmer living with his wife Virginia and their three young children (Jeanette, Ralph, and Mary). The 1920 population census more specifically indicates that Smith was a dairy farmer (US Census 1910 and 1920). A 1925 topographic map reveals that a mine was located southeast of the Patton Farm on the east side of Kingwood Pike (Figure 3) (USGS 1925). The oil tanks referenced in the 1902 map were extant at this time. A church (Harner Chapel) and school house (Dorsey Schoolhouse) are illustrated north of the Patton Farm at the intersection of Kingwood Pike and Luckey Lane. The Harner Chapel was constructed in 1909 and built on land donated by Philip Fairchild Harner (Monongalia County Historical Society 1954). Jefferson Smith died in 1933 and left his property to his wife Virginia (Monongalia County Deeds 1933).

In 1947, Virginia Smith deeded approximately 9.9 acres of land, which is the present day acreage of the Patton Farm to her daughter Mary Virginia Smith (Monongalia County Deeds 1947). A 1957 topographic map reveals the Patton Farm also included a barn (not extant) which was likely built in the late 19th or early 20th century and used by Jefferson Smith on his dairy farm (Figure 3) (USGS 1957). The mine referenced in the 1925 map was no longer extant. A cemetery was located northwest of the Patton Farm; it is possible this is the Dorsey family burial plot referenced in the 1893 deed (Monongalia County Deeds 1893). Harner Chapel and the Dorsey School were extant to the north and some development was beginning to occur in the vicinity of these two buildings. Only three of the oil storage tanks illustrated in the 1925 topographic map were extant and the area to the southeast and southwest of the Patton Farm was largely undeveloped (USGS 1957). Mary Smith died in 1991 and left the property to the Robert M. Hastings Trust. The land was conveyed to Dewey Samuel Hastings, Mary's nephew, in 1998 (Monongalia County Deeds 1998).

A modern aerial photograph reveals that the barn referenced in the 1957 topographic map has been demolished and replaced with a ca. 1980 pole barn (see Site Maps) (Google Earth 2018). Areas of residential development dating to the 1960s and 1970s are located northwest of the house on the north side of Greenbag Road. The area southeast of the Patton Farm comprises

dense woods. The sprawling complex of the Morgantown Kennedy Center Federal Correctional Institution is located southwest of the Anderson House on the west side of Kingwood Pike. The complex was built ca. 1968 as the Robert F. Kennedy Youth Center before it was converted into a federal prison in the 1970s (Kasey 2015:51).

The Patton Farm is not eligible for NRHP listing under Criterion A. Although the property was associated with dairy farming in Monongalia Township, the historic-era barn is no longer extant and the property no longer conveys its association with agricultural history. The Patton Farm is associated with Dr. Frederick Patton and his wife Eliza Patton as well as the Smith family. However, no information was recovered to suggest the Patton or Smith families were significant on the local, state, or national level. Therefore, the Patton Farm is not eligible for NRHP listing under Criterion B.

The Patton Farm has undergone a loss of integrity due to alterations to the farmhouse (including replacement windows, replacement siding and roof materials, the alteration of the large porch, and the removal of characteristic architectural elements) and the property (loss of the historic barn and historically associated farmland). For these reasons, the Patton Farm is not eligible for NRHP listing under Criterion C. The farm has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Patton Farm **SITE#** MG-2646

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1925 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

1957 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Patton Farm **SITE#** MG-2646



Photograph 1. Farmhouse, facing northeast (Markosky 2018-12-04)



Photograph 2. Root cellar, facing east (Markosky 2018-12-04)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

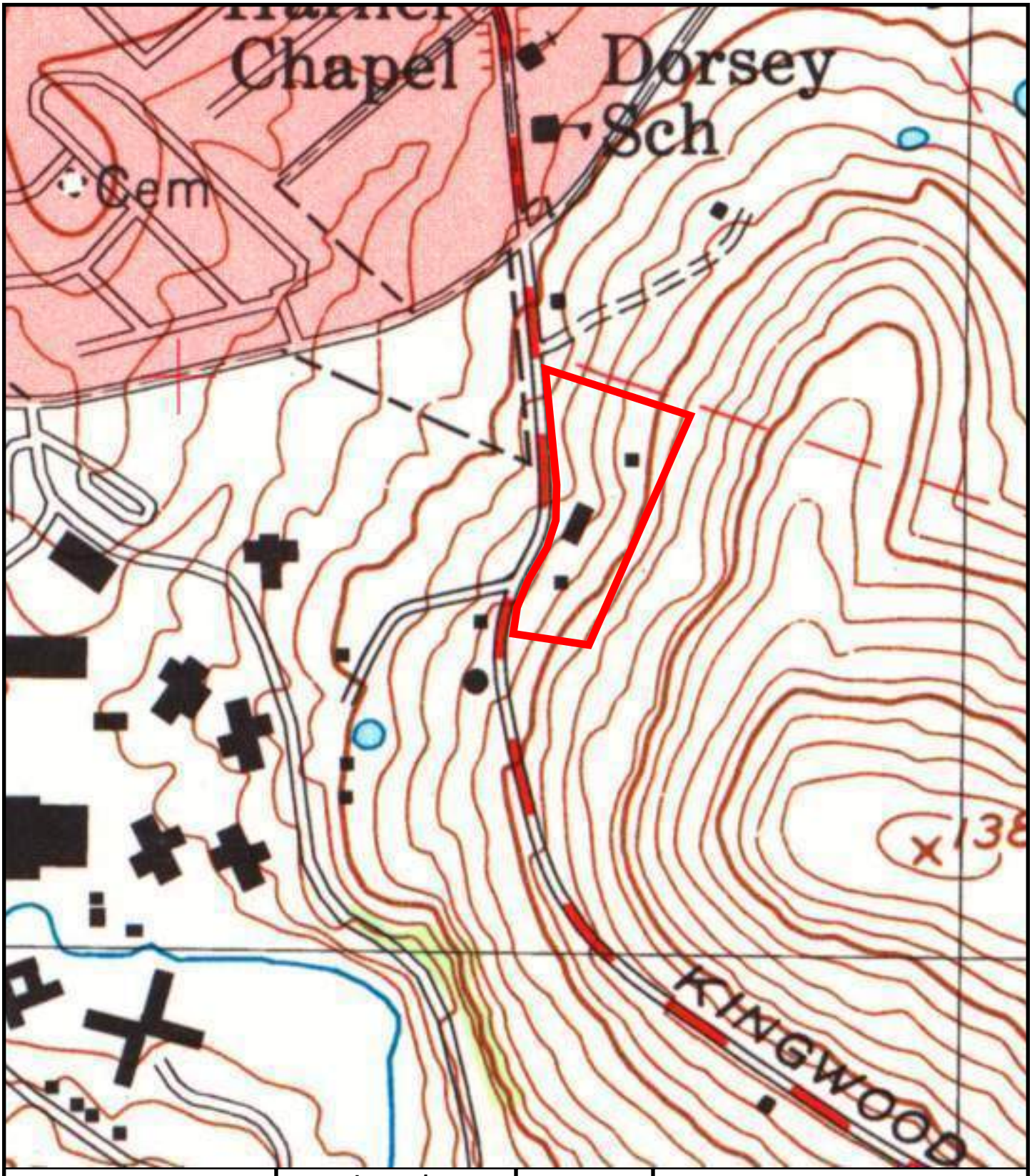
NAME Patton Farm **SITE#** MG-2646



Photograph 3. Shed #1 (foreground) and Shed #2 (background), facing east (Markosky 2018-12-04)



Photograph 4. Non-historic pole barn, facing northeast (Markosky 2018-12-04)



Feet
0 375 750

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2646
Patton Farm (87 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2646
Patton Farm (87 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



*Not to scale

Legend

Approximate Parcel Boundary

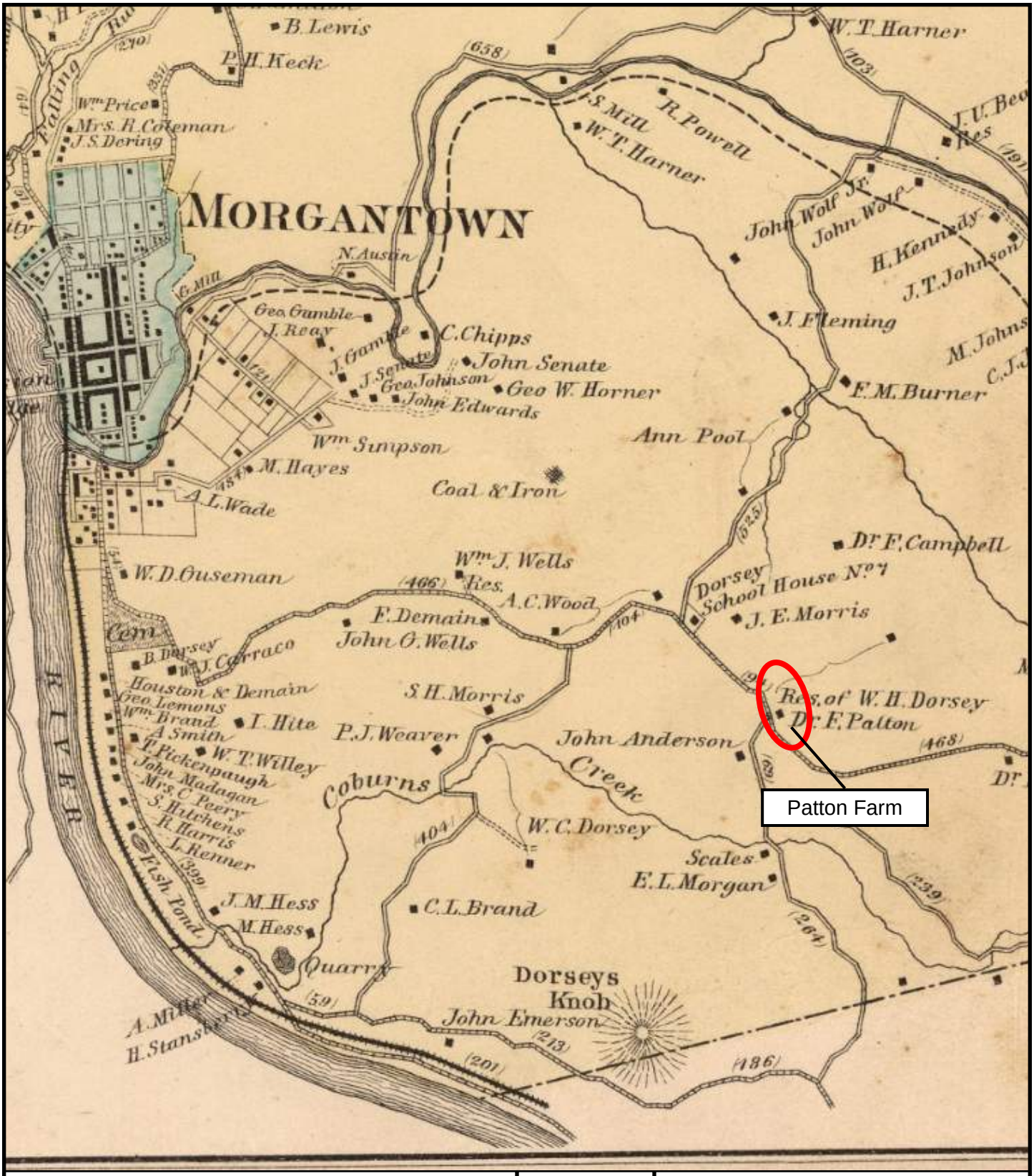
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Site Map Detail
MG-2646
Patton Farm (87 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018

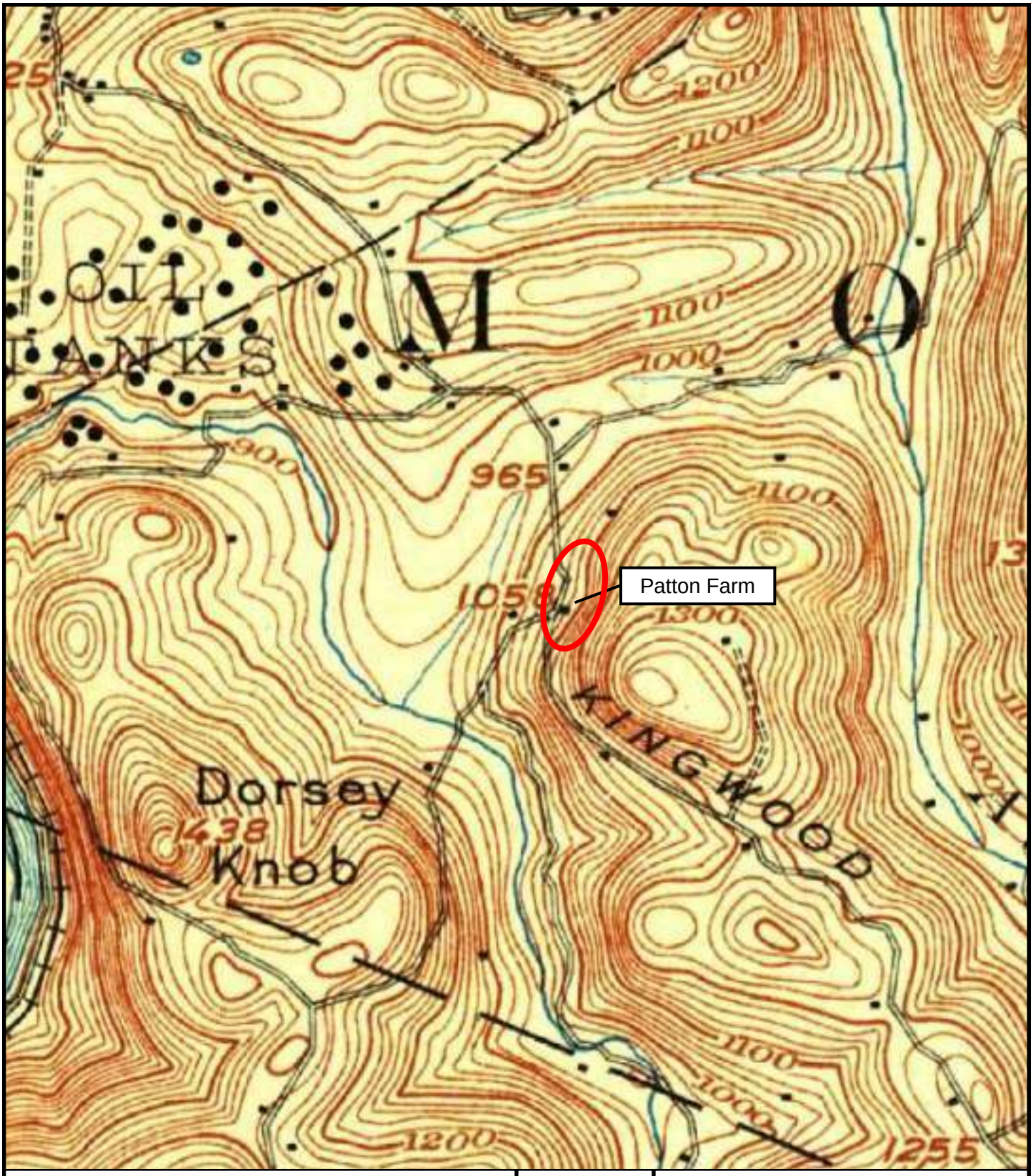


*Not to Scale.

Figure 1. Location of MG-2646 / Patton Farm in 1886

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Lothrop, et. al 1886



*Not to Scale.

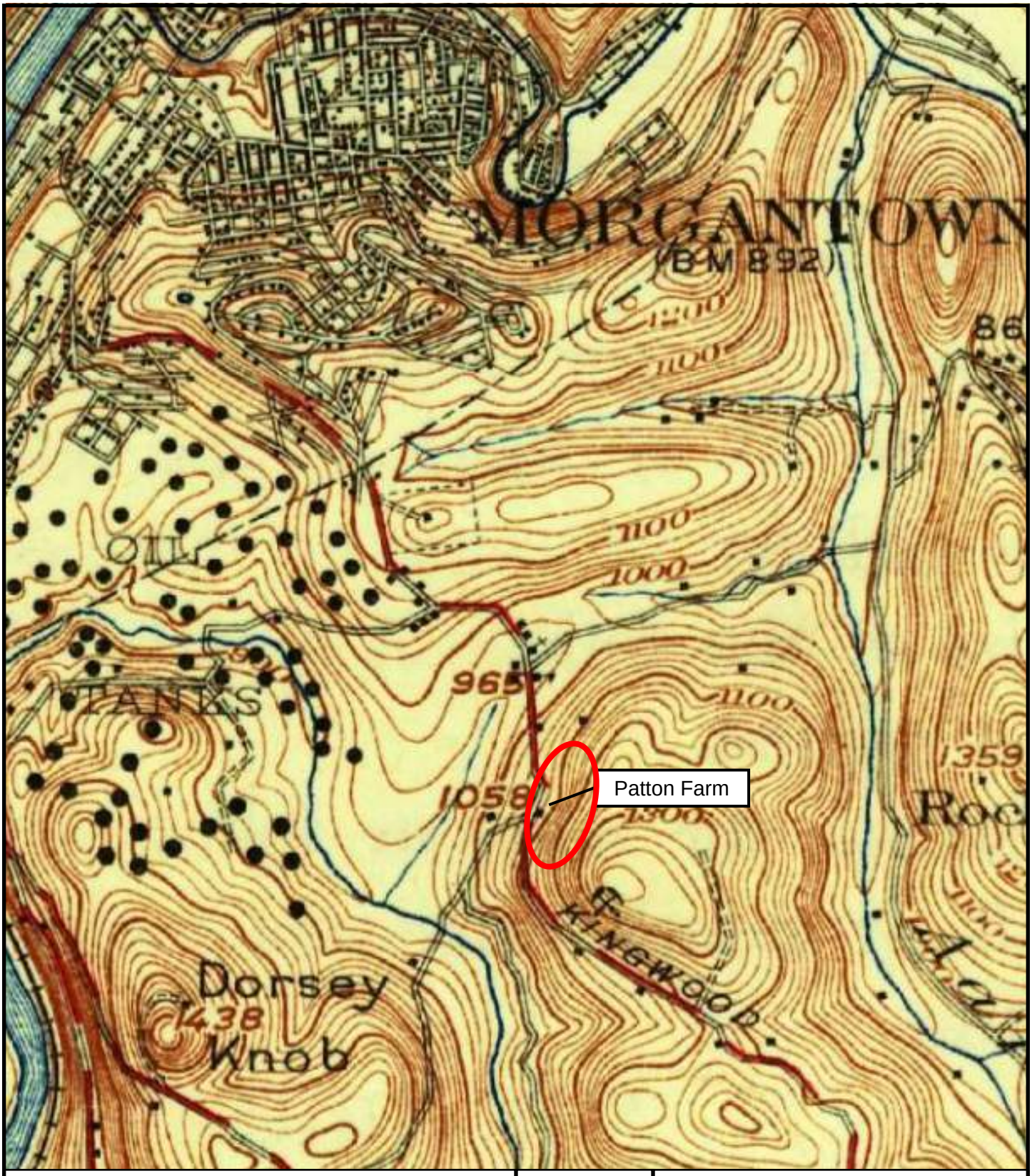
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Figure 2. Location of MG-2646 / Patton Farm in 1902

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1902



*Not to Scale.

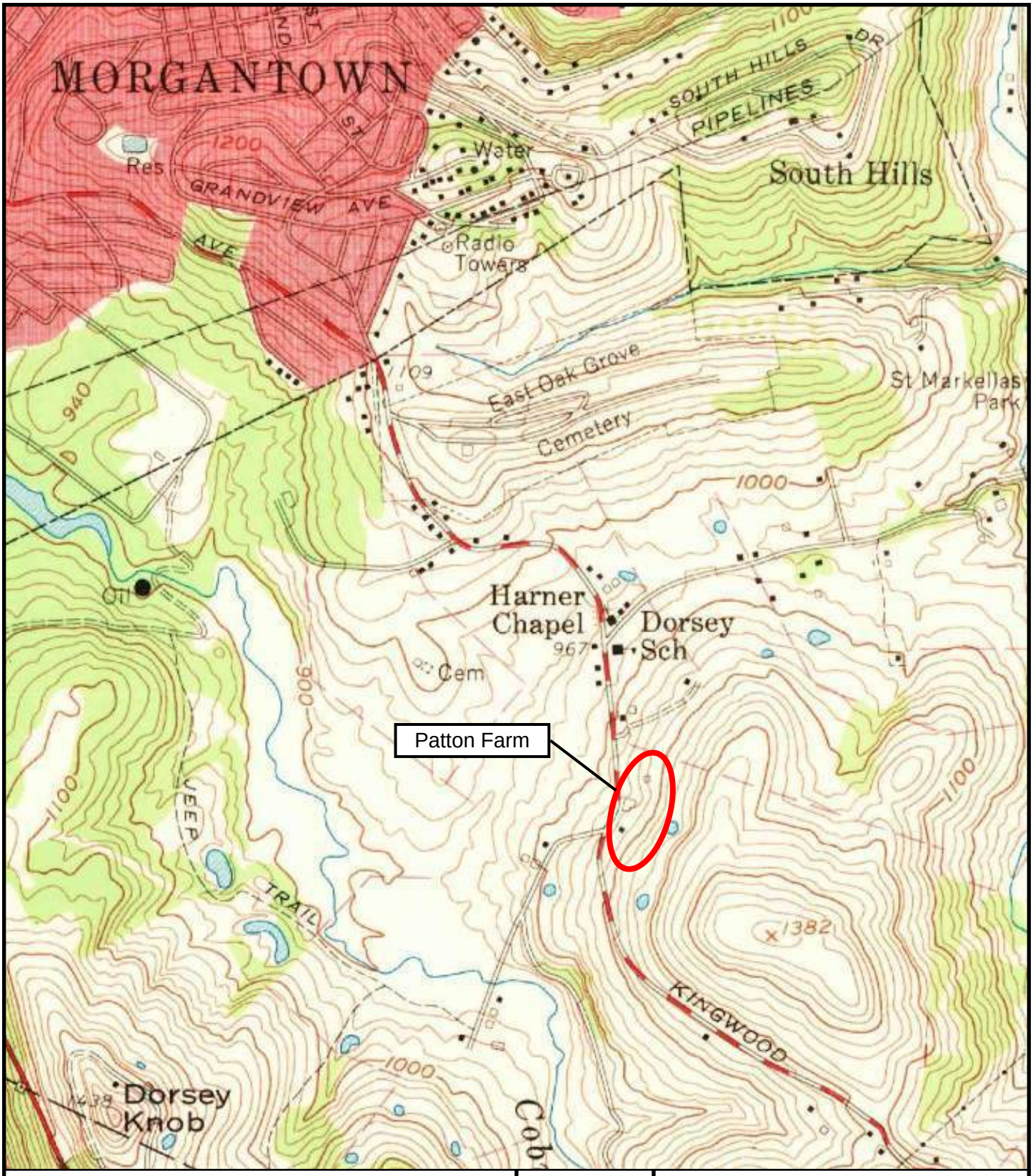
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Figure 3. Location of MG - 2646 / Patton Farm in 1925

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1925



*Not to Scale.

N
W E
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Figure 4. Location of MG-2646 / Patton Farm in 1957

MARKOSKY

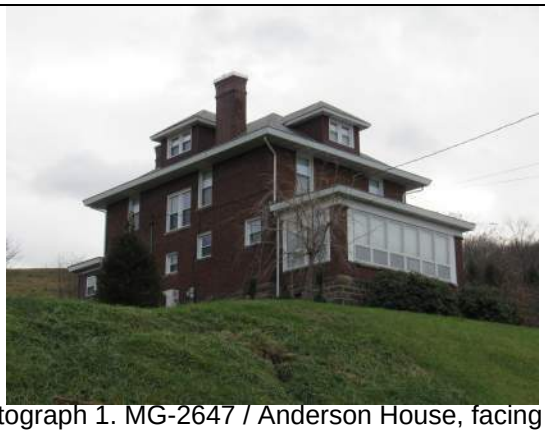
Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1957



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 27 Kingwood Pike	**Common/Historic Name/Both** ○ ◉ ○ Anderson House	**Field Survey #**	**Site # *(SHPO Only)*** MG-2647
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1922	**Style** American Four-Square	
Exterior Siding/Materials Brick	**Roofing Material** Asphalt - shingles	**Foundation** Stone - Ashlar	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590605 / 4384619	 Photograph 1. MG-2647 / Anderson House, facing southeast	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South **Part of What Survey/FR#** Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2647

Site No.

N

Present Owners	Owners Mailing Address
Garrett Richards Phone #	27 Kingwood Pike, Morgantown, WV 26508

Describe Setting

See continuation sheet.

0.55 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2 **Stories** 2 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Additions ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Anderson House **SITE#** MG-2647

MG-2647 / Anderson House at 27 Kingwood Pike is located within a 0.55 acre parcel on the east side of Kingwood Pike, approximately 254 feet south of its intersection with Greenbag Road. The house is located on a slope overlooking Greenbag Road. The surrounding area consists of open fields formerly used as farm land to the east and west and an area of residential and commercial buildings to the north.

The Anderson House is a ca. 1922, two-and-a-half-story American Four-Square house standing two bays wide and four bays deep (Photographs 1 and 2). The house rests on an ashlar stone foundation and is covered in stretcher bond brick. The hipped roof features overhanging eaves and is covered in asphalt shingle. The roof is pierced by two interior brick chimneys and includes three hipped roof dormer windows clad in vinyl siding. Fenestration consists of replacement one-over-one and vinyl sash windows with simple stone sills. The porch on the façade (west elevation) has been enclosed with vinyl sash hopper windows. The original entrance is located within the porch and an alternate entrance is now located on the south elevation. A one-story, partial width addition has been appended to the rear (east) elevation. A one-story, partial width addition has been appended to the rear (east) elevation. A ca. 1980, two-bay detached garage clad in standing seam metal is located east of the house and a ca. 2010 pole barn located farther to the northeast was not visible from the public ROW.

The Anderson House was built ca. 1922 on land once owned by George Dorsey, an early settler who came to this area of Monongalia County in 1807 (Core 1976:381). Dorsey owned over 1,000 acres along Coburn's Creek. Dorsey's Knob, a rock formation and tourist attraction since the late 19th century, was named for George Dorsey (Muttillo and Blosser 2018). George Dorsey died in 1824 and his land was deeded to his children, including his son George Dorsey, Jr. (Butcher 1912:873). George Dorsey, Jr's daughter Eliza (Dorsey) Patton and her husband Dr. Frederick Patton sold 73 acres of this land to George W. Morris in 1882 (Monongalia County Deeds 1882). An 1886 map of Monongalia County indicates there was no dwelling in the vicinity of the Anderson House at that time, although the land was occupied by J.E. Morris (Figure 1) (Lothrop, et. al 1886). The residence of Dr. F. (Frederick) Patton is illustrated on the east side of the Kingwood, Morgantown, and West Union Turnpike (modern day Kingwood Pike) south of where the Anderson House is now located. The map also reveals that at this time, John Anderson (a future owner of the property) lived to the southwest of Frederick Patton along a no longer extant road. The greater vicinity at this time was dotted with dwellings along the established roadways. The Dorsey School House No. 1 was located north of John Anderson's land at the intersection of the Kingwood Pike and modern day Luckey Lane (Lothrop, et. al 1886).

In 1900, George Morris deeded his 73 acres to John Anderson and his wife Tillie (Monongalia County Deeds 1900). According to the 1900 population census, John Anderson was a 53 year old farmer residing in a house with his wife Matilda (Tillie) and their three young sons (David J., Ray, and Roy) (US Census 1900). There is no dwelling indicated in the vicinity of the Anderson House on a 1902 topographic map. John Anderson died in 1913, and his will stipulated that his land was to be divided among his three sons. In 1922, Tillie, Ray, and Roy Anderson conveyed

their shares of the 73-acre property to David Anderson (referred to in the property deeds as John D. Anderson) (Monongalia County Deeds 1922). David and his wife Opal had also acquired 62 acres of adjoining land in 1919 (Monongalia County Deeds 1919).

A 1925 topographic map indicates that the Anderson House was constructed by this time on the east side of Kingwood Pike (Figure 2) (USGS 1925). The Dorsey School House and a church (Harner Chapel) were located to the north of the house at the intersection of the Kingwood Pike and Luckey Lane. Dwellings were located along the established roads to the east and south. Morgantown is again illustrated to the northwest. A large assemblage of oil storage tanks was located to the west of the Kingwood Pike and east of the Monongahela River. The tanks were constructed by the Eureka Pipeline Company, a subsidiary of the Standard Oil Company, in 1890. The tanks were used to store oil extracted throughout Monongalia County that was awaiting transport via pipelines (USGS 1925; Core 1982:144).

David and Opal Anderson acquired an additional 31 acres of land from John and Ella Frum in 1926 for a farm covering approximately 166 acres (Monongalia County Deeds 1926). The 1930 population census indicates that David Anderson was a 37 year old farmer working on his own dairy farm (US Census 1930). He lived in a household with his wife Opal (also age 37), their three young children (John D., Richard, and Eleanor), and two boarders who worked on the farm. A 1957 topographic map indicates the property also contained a barn (no longer extant), which was located northeast of the Anderson House and was likely built around the same time (Figure 3) (USGS 1957). The map reveals that the Dorsey School and Harner Chapel were extant and few dwellings were constructed in the area immediately to the west. Dwellings were scattered intermittently along the Kingwood Pike to the south and more concentrated development was beginning to occur to the north. Only three of the oil storage tanks illustrated in the 1925 topographic map were extant and the area to the southwest of the Anderson House was largely undeveloped.

David Anderson died in 1975, and in 1979, his son Richard, along with his wife Rachelle Anderson, deeded the three tracts of land to his siblings Elinor Richards and John D. Richards (Monongalia County Deeds 1979). In 2011, the approximately one-half acre subdivided parcel containing the Anderson House was conveyed to Garrett Richards, a grandson of Elinor Richards (Monongalia County Deeds 2011c). The large field located to the east of the Anderson House remains in the Richards family as part of a separate tax parcel (Monongalia County Deeds 2011b). The garage located northeast of the house was constructed ca. 1980 (see Site Maps) (Google Earth 2018). Greenbag Road, which was constructed in the early 1960s, extends east-west to the north of the Anderson House. Areas of residential development dating to the 1960s and 1970s are located northwest of the house on the north side of Greenbag Road. The sprawling complex of the Morgantown Kennedy Center Federal Correctional Institution is located southwest of the Anderson House on the west side of Kingwood Pike. The complex was built in 1968 as the Robert F. Kennedy Youth Center before it was converted into a federal prison in the 1970s (Kasey 2015:51).

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Anderson House **SITE#** MG-2647

The Anderson House is not eligible for listing in the National Register of Historical Places (NRHP) under Criterion A. Although the house was associated with dairy farming in Monongalia County, the historic-era dairy barn and associated farm acreage are no longer extant, and the property no longer conveys its association with agricultural history. The house is associated with the Anderson Family, namely John Anderson and his son David; however, no information was recovered to suggest that the Anderson family was significant on the local, state, or national level. Therefore, the Anderson House is not eligible for NRHP listing under Criterion B. The Anderson House has undergone a loss of integrity due to replacement windows, replacement roof materials, the enclosure of the front porch, and alterations to original door openings. The house does not possess the architectural merit necessary for listing in the NRHP. For these reasons, the Anderson House is not eligible for NRHP listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Anderson House **SITE#** MG-2647

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1979 Richard and Rachelle Anderson to Elinor Richards and John D. Anderson. Deed Book 826, Page 472. On file, Monongalia County Clerk, Morgantown, West Virginia.

2009 Elinor A. Richards to the Elinor A. Richards, trustee of the Elinor A. Richards Trust. Deed Book 1390, Page 229. On file, Monongalia County Clerk, Morgantown, West Virginia.

2011a Thomas E. Richards, trustee of the Elinor A. Richards Trust to Thomas E. Richards, trustee of the Thomas E. Richards Trust. Deed Book 1444, Page 638. On file, Monongalia County Clerk, Morgantown, West Virginia.

2011b Thomas E. Richards, trustee of the Thomas E. Richards Trust to Thomas E. Richards. Deed Book 1444, Page 862. On file, Monongalia County Clerk, Morgantown, West Virginia.

2011c Thomas E. Richards to Garrett Richards. Deed Book 1449, Page 758. On file, Monongalia County Clerk, Morgantown, West Virginia.

Tract 2

1882 Frederick H. Patton and Eliza Patton to George W. Morris. Dees Book 17, Page 66. On file, Monongalia County Clerk, Morgantown, West Virginia.

1900 George W. Morris to John D. Anderson and Tillie Anderson. Deed Book 53, Page 160. On file, Monongalia County Clerk, Morgantown, West Virginia.

1922 Tillie Anderson, Roy Anderson, and Ray Anderson to John Anderson. Deed Book 181, Page 13. On file, Monongalia County Clerk, Morgantown, West Virginia.

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Tract 4

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United States Bureau of the Census (US Census)

1900 Twelfth Census of the United States. 1900, Morgan, Monongalia West Virginia, Enumeration District 0084. Records of the Bureau of the Census, FHL Microfilm 1241767. National Archives, Washington, D.C.

1930 Fifteenth Census of the United States. 1930, Morgan, Monongalia West Virginia, Enumeration District 0026. Records of the Bureau of the Census, FHL Microfilm 2342282. National Archives, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Anderson House** **SITE#** **MG-2647**

References (continued)

United States Geological Survey (USGS)

1902 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

1925 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

1957 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

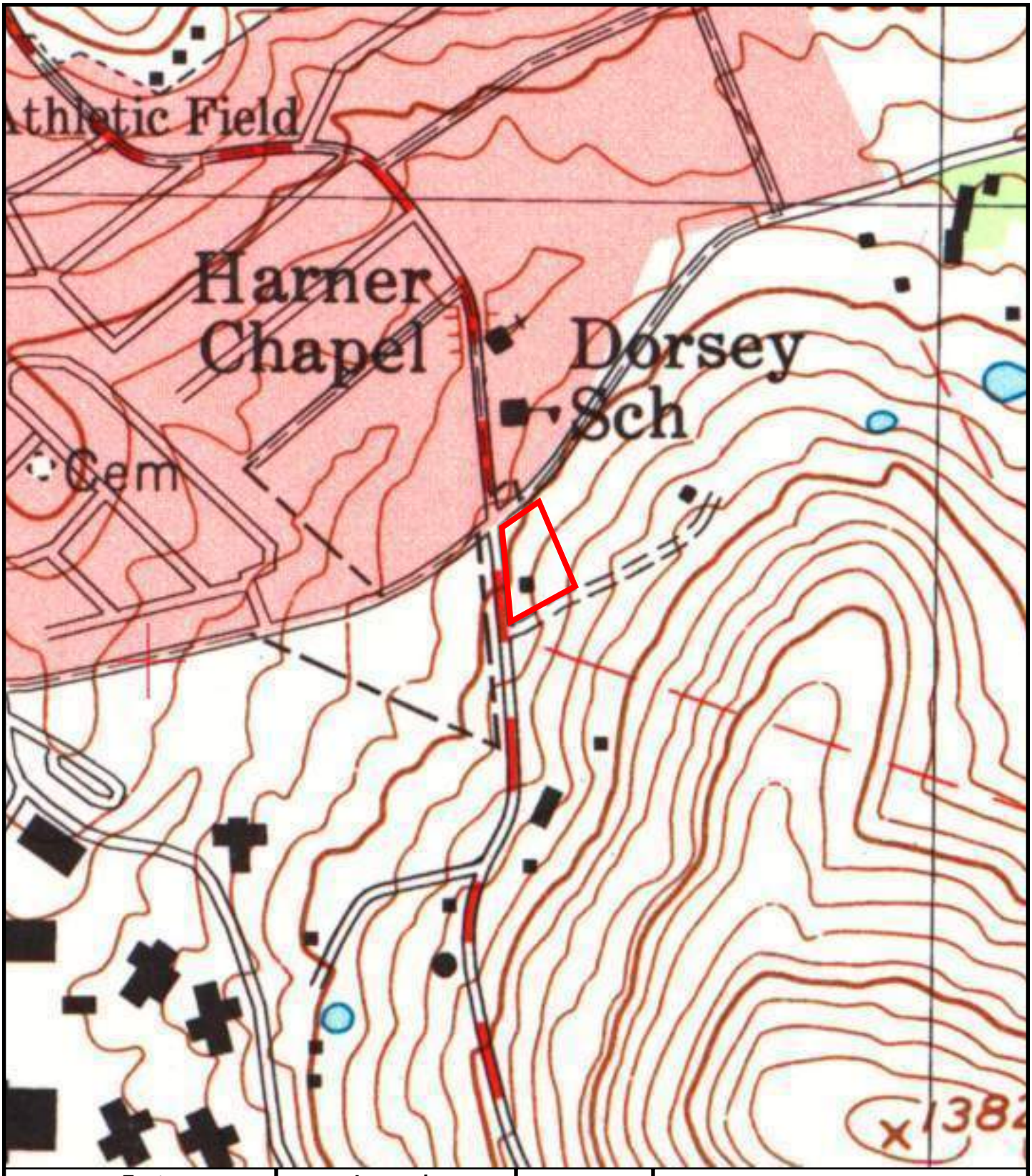
NAME Anderson House **SITE#** MG-2647



Photograph 1. Overview showing house and non-historic garage, facing northeast (Markosky 2018-12-04)



Photograph 2. House showing enclosed front porch, facing southeast (Markosky 2018-12-04)



Feet

0 375 750

Legend

Location of Historic Structure

N

W E

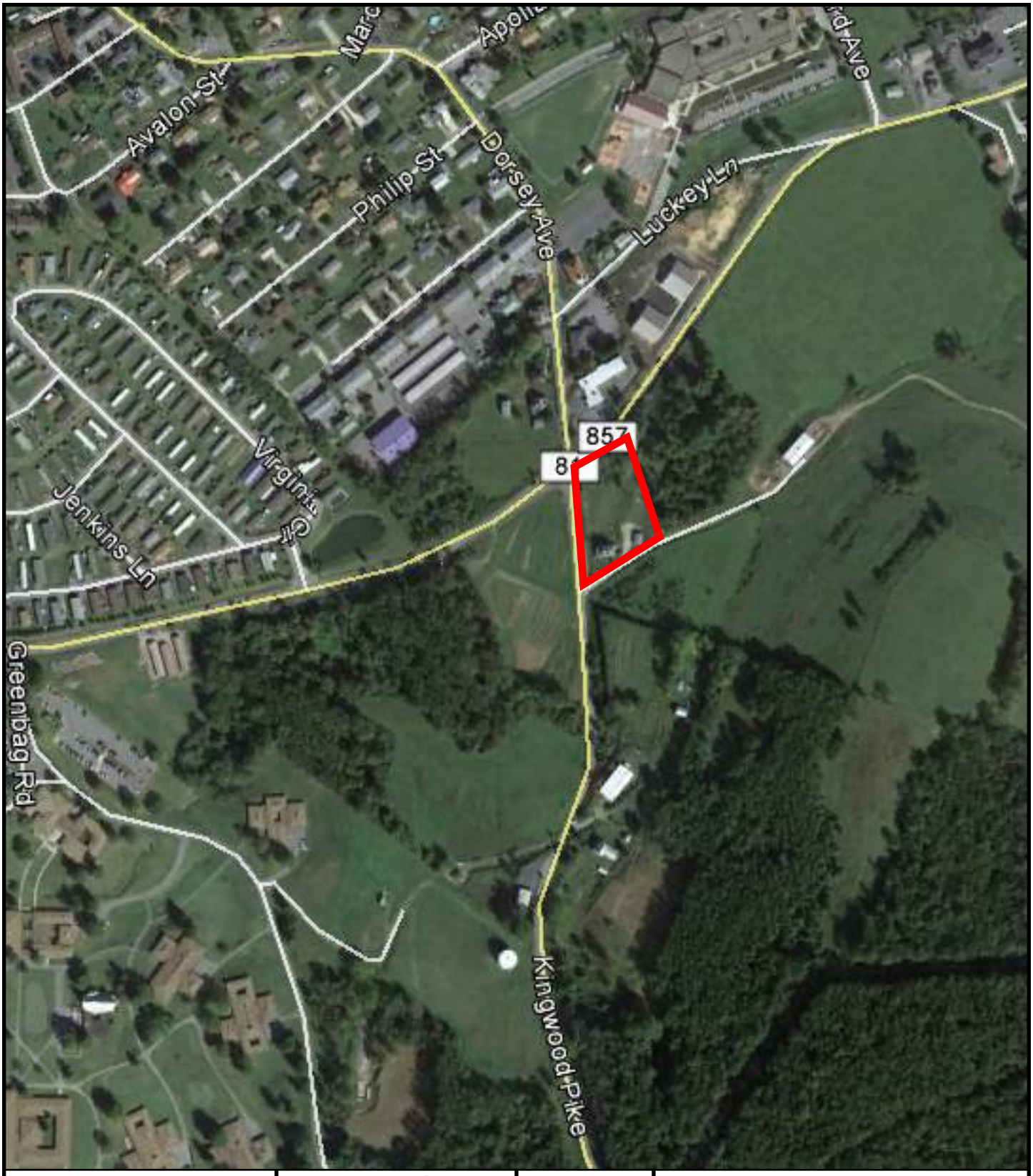
S

USGS Map
MG-2647
Anderson House (27 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

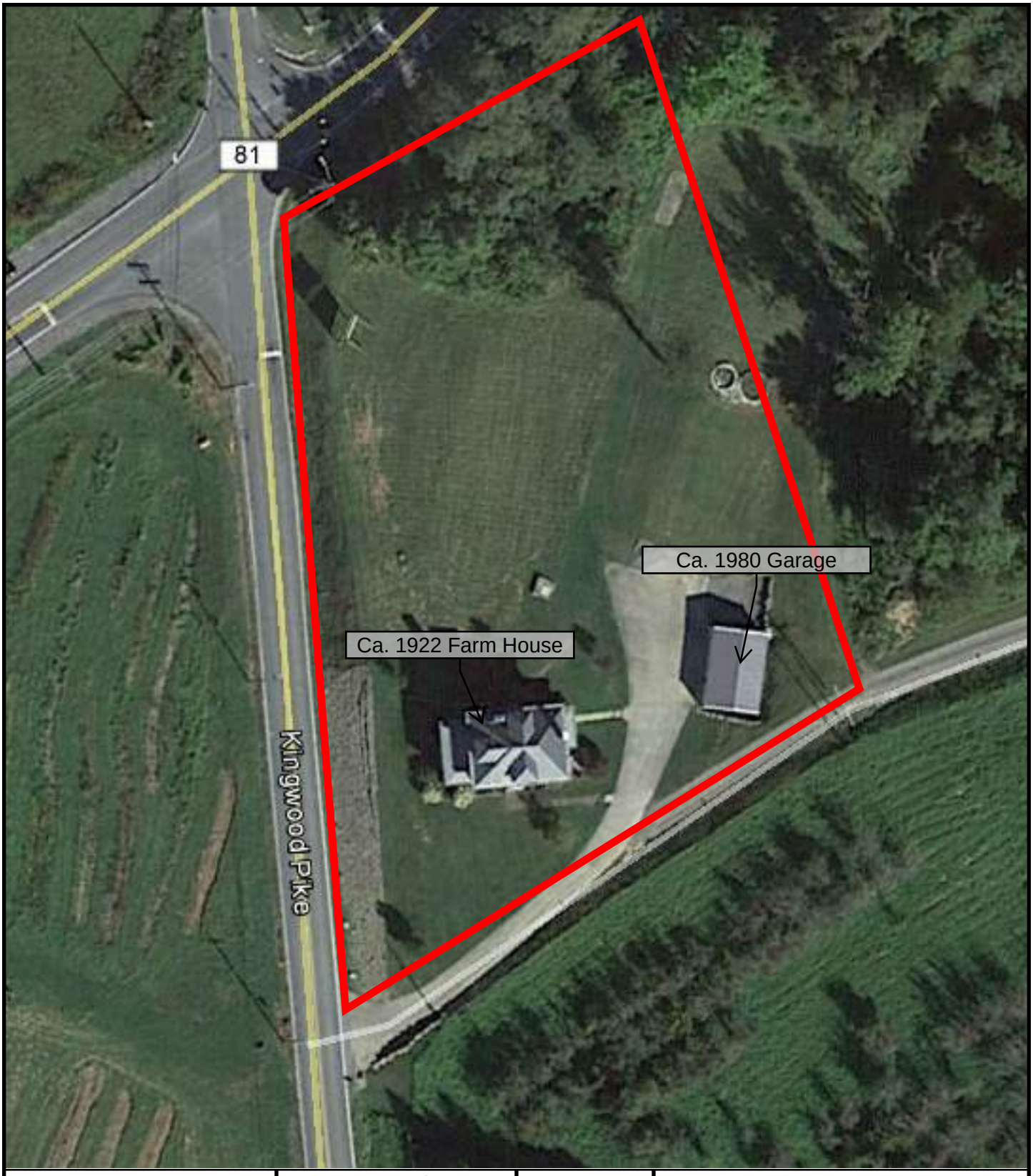
N
W E
S

Site Map
MG-2647
Anderson House (27 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



*Not to scale

Legend

Approximate Parcel Boundary

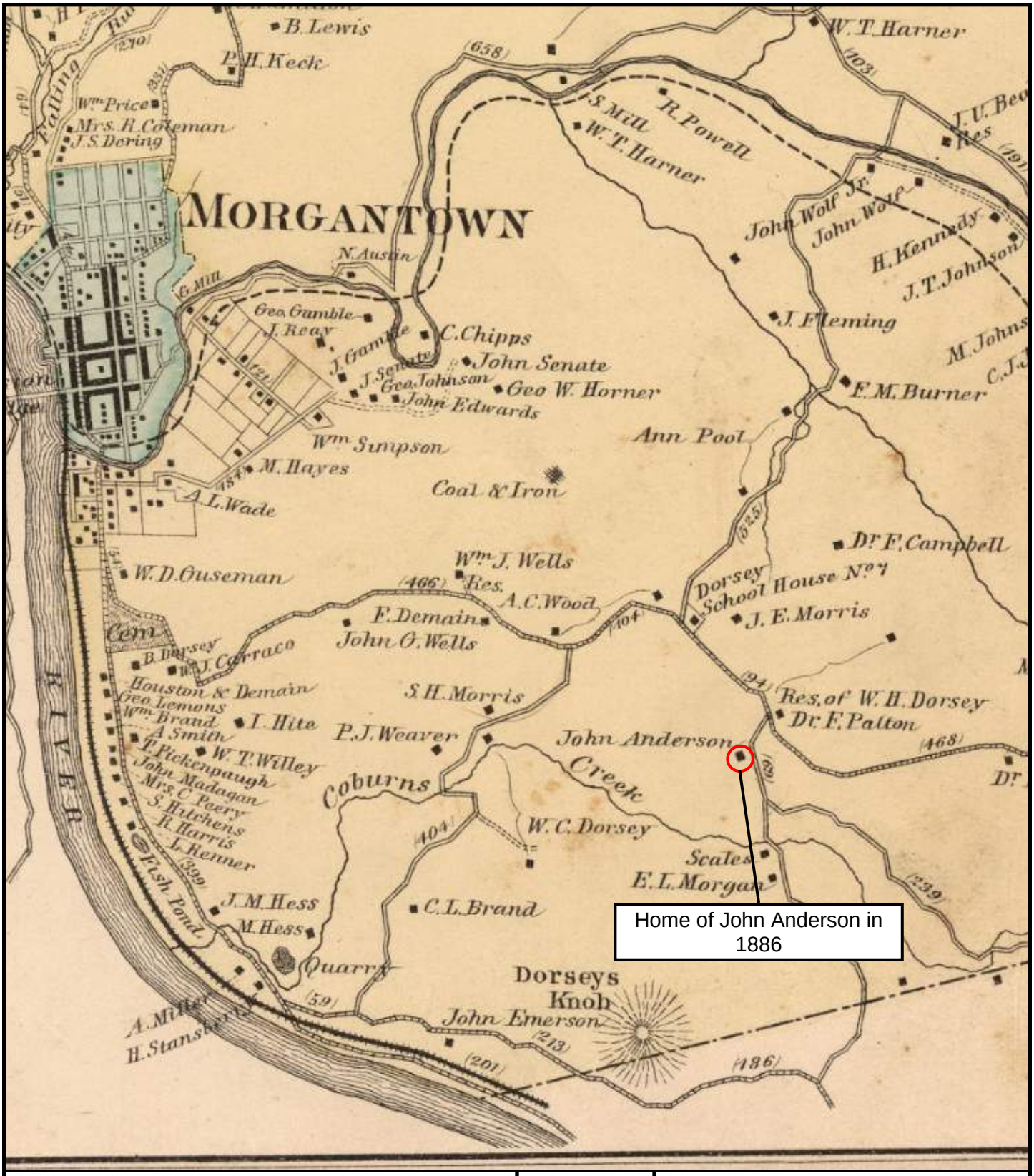
N
W E
S

Site Map Detail
MG-2647
Anderson House (27 Kingwood Pike)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018

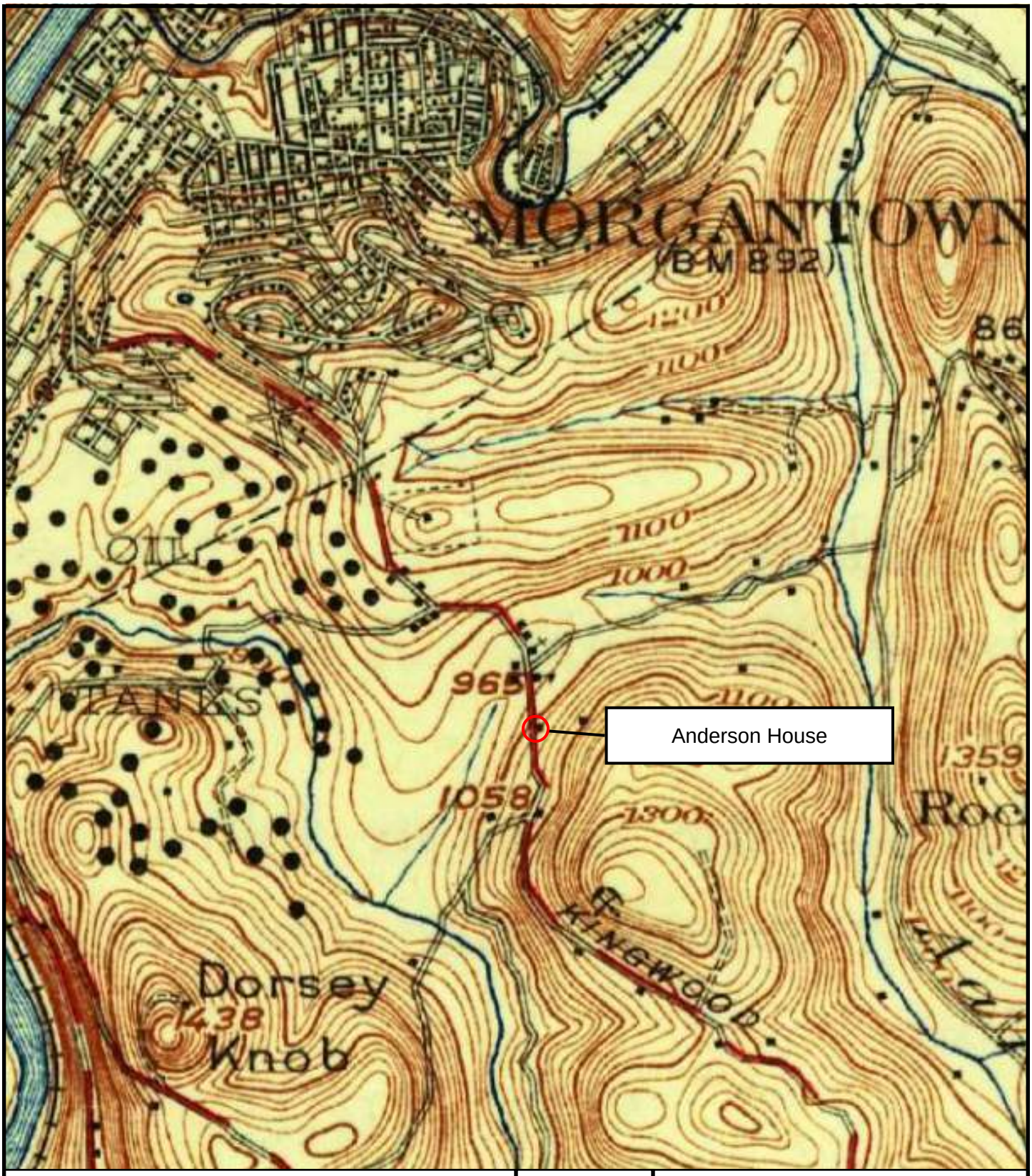


*Not to Scale.

Figure 1. Home and Land of John Anderson in 1886

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Lothrop, et. al 1886



*Not to Scale.

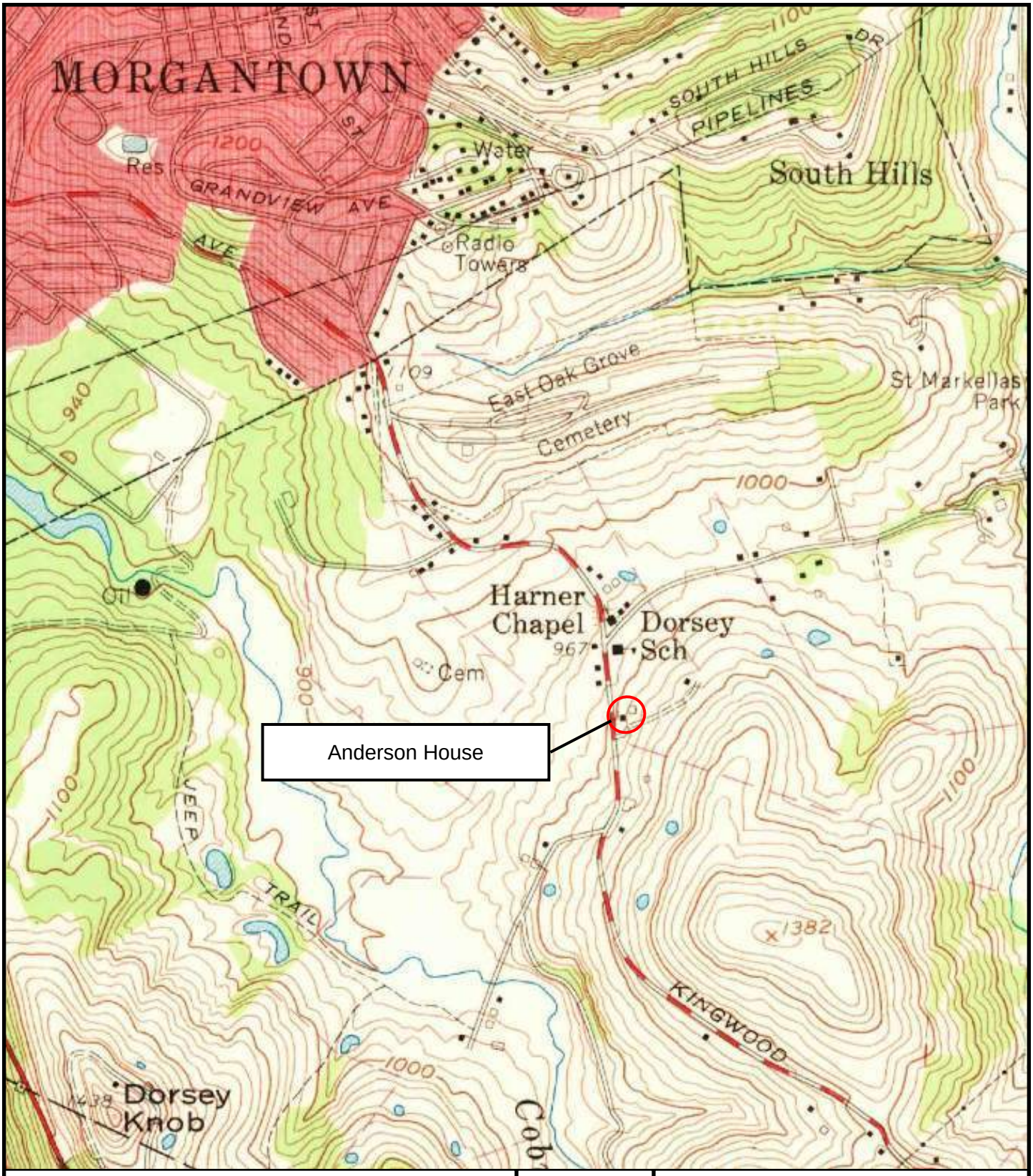
N
W E
S

Figure 2. Location of MG-2647 / Anderson House in 1925

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1925



*Not to Scale.

N
W E
S

Figure 3. Location of MG-2647 / Anderson House in 1957

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1957



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 1440 Dorsey Avenue	**Common/Historic Name/Both** ◉ ○ ○ House at 1440 Dorsey Avenue	**Field Survey #**	**Site # *(SHPO Only)*** MG-2648
Town or Community Eastern District	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1915	**Style** Bungalow - gable front	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt - Shingles	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590546 / 4384745	 Photograph 1. MG-2648 / House at 1440 Dorsey Avenue, facing northwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South **Part of What Survey/FR#** Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2648

Site No.

N

Present Owners	Owners Mailing Address
Robert and Carol Hastings Phone #	P.O. Box 301, Morgantown, WV 26507

Describe Setting

See continuation sheet.

.80 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1.5 **Stories** 2 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe** See continuation sheet.

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 1440 Dorsey Avenue **SITE#** MG-2648

The House at 1440 Dorsey Avenue is located on the west side of Dorsey Avenue approximately 170 feet north of its intersection with Greenbag Road. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road approximately 1.61 miles southwest of the city of Morgantown.

The house at 1440 Dorsey Avenue is a one-and-a-half-story ca. 1915 Bungalow style dwelling partially clad in vinyl siding and wood shingle (Photograph 1). The house rests on a rock faced concrete block foundation and is capped by a side gable roof covered in asphalt shingle. Decorative brackets adorn the overhanging eaves. The roof is pierced by an interior brick chimney and features a front gable dormer on the façade (east elevation). Fenestration consists of replacement one-over-one vinyl sash windows and fixed glass block windows in the basement level. The integral front porch has been partially enclosed with vinyl siding. A ca. 1990 two-bay detached garage covered in vinyl siding and capped by an asphalt shingle front gable roof is located immediately south of the house (Photograph 2). A ca. 2000 combination garage and shed clad in vinyl siding and capped by an asphalt shingle gable roof is located west of the house (Photographs 1 and 2).

No information was recovered linking the house at 1440 Dorsey Avenue to events significant on the local, state, or national level. Therefore, the house is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, the house is not eligible for listing under Criterion B.

The house at 1440 Dorsey Avenue lacks integrity because it has undergone alterations including the replacement of siding, windows, and roof materials and the partial enclosure of the front porch. While the house maintains some characteristic architectural elements of the Bungalow house type and Craftsman style, such as the brackets in the eaves, it stands as a common and unexceptional example of its kind and does not possess the architectural merit necessary for listing in the NRHP. Higher style examples of the Bungalow and Craftsman styles can be found in the NRHP listed Chancery Hill and South Park Historic Districts located approximately one mile to the northwest. Therefore, it is not recommended eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

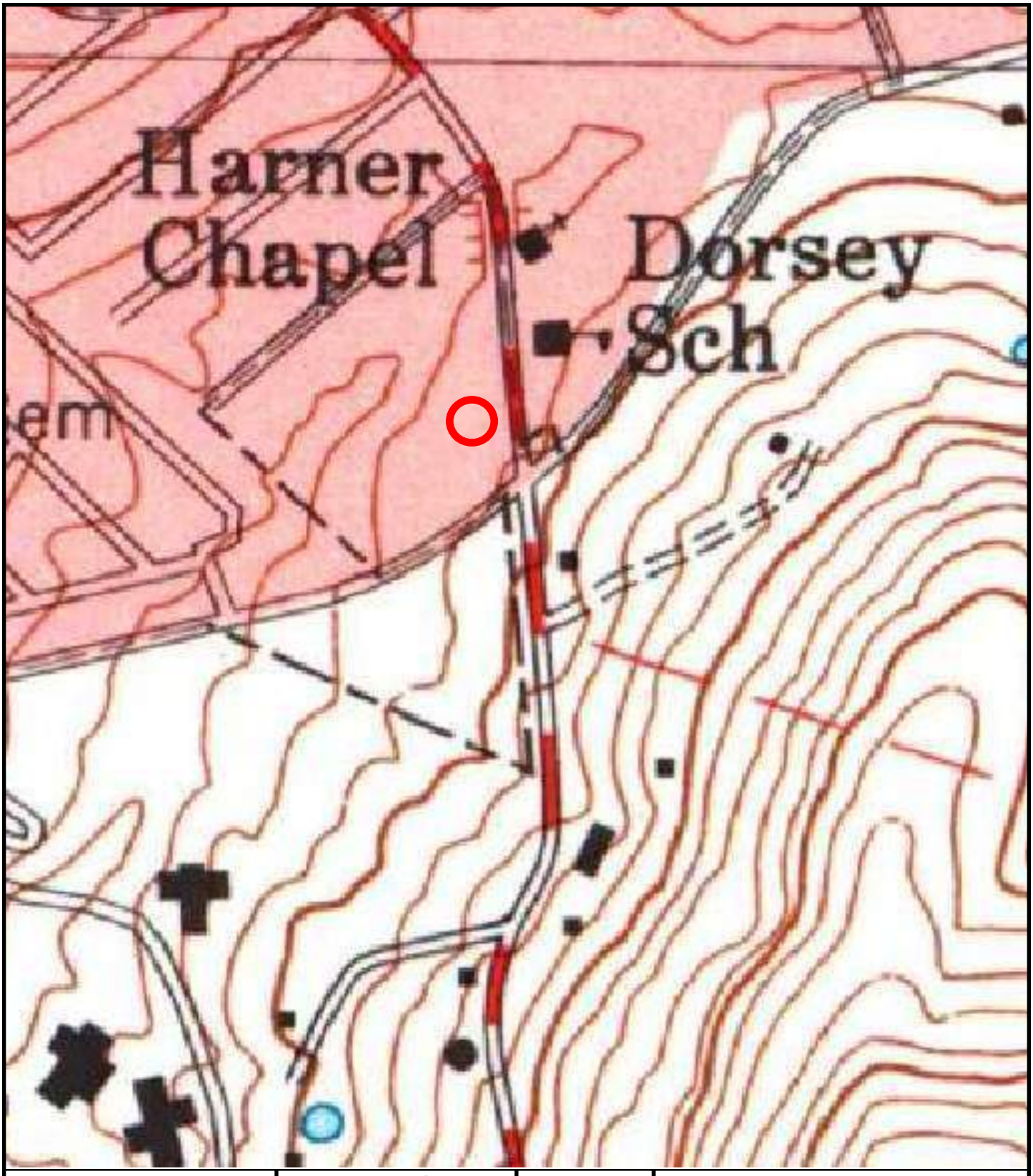
NAME House at 1440 Dorsey Avenue **SITE#** MG-2648



Photograph 1. House, non-historic garage, and larger non-historic garage in background, facing west (Markosky 2018-12-04)



Photograph 2. House and non-historic garage (left), facing southwest (Markosky 2018-12-04)



Feet
0 300 600

Legend
Approximate Location of Historic Structure

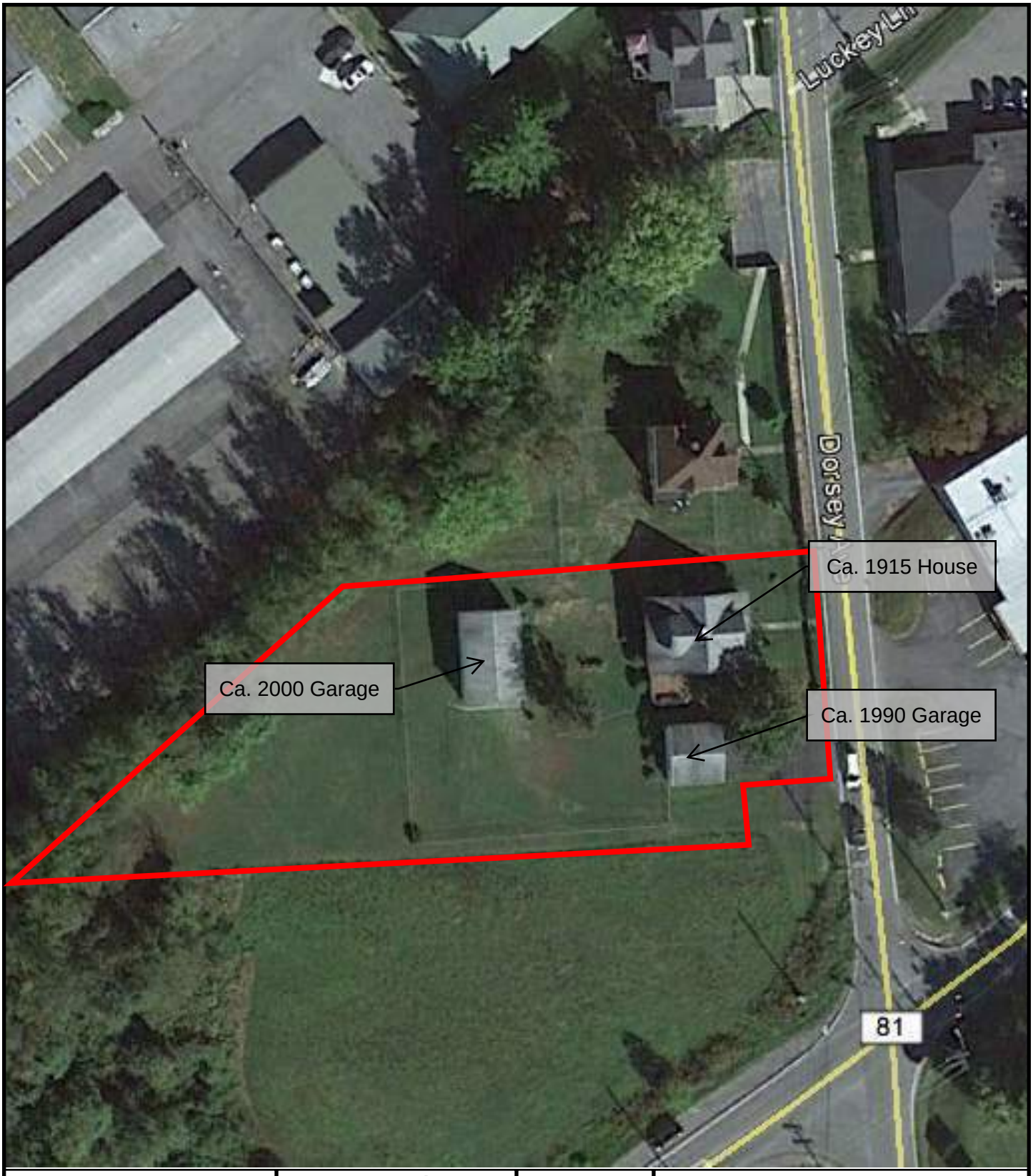
N
W E
S

USGS Map
MG-2648
House at 1440 Dorsey Avenue

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2648
House at 1440 Dorsey Avenue

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 1436 Dorsey Avenue	**Common/Historic Name/Both** ○ ◉ ○ Smith House	**Field Survey #**	**Site # *(SHPO Only)*** MG-2649
Town or Community Eastern District	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1915	**Style** Four-Square	
Exterior Siding/Materials Synthetics - VInyl	**Roofing Material** Asphalt - Shingles	**Foundation** Stucco covered	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590545 / 4384769	 Photograph 1. MG-2649 / Smith House, facing northwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2649

Site No.

N

Present Owners	Owners Mailing Address
Edward Hastings Phone #	7 Bates Road, Morgantown, WV 26505

Describe Setting

See continuation sheet.

.71 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2 **Stories** 2 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe** See continuation sheet.

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Smith House **SITE#** MG-2649

MG-2649 / Smith House at 1436 Dorsey Avenue is located on the west side of Dorsey Avenue approximately 250 feet north of its intersection with Greenbag Road. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road approximately 1.58 miles southwest of the city of Morgantown.

The Smith House is a ca. 1915 two-story modified Four-Square dwelling clad in vinyl siding and resting on a foundation covered in stucco (Photographs 1 and 2). The steeply pitched hipped roof is covered in asphalt shingle and features three cross gable wall dormer windows with gable returns that appear to be variants on the Free-Classic Queen Anne Style. The roof is pierced by one interior brick chimney. Fenestration consists of replacement one-over-one vinyl sash windows, one fixed diamond shaped vinyl sash window, and an altered fixed vinyl sash picture window. The full width hipped roof porch on the façade (east elevation) is supported by simple square columns and features a cross gable pediment.

No information was recovered linking the Smith House to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. During the first decades of the 19th century the house was owned by Jefferson Smith who owned the property at 87 Kingwood Pike (approximately 0.26 miles to the southeast on the east side of Kingwood Pike). However, no information was recovered to suggest that Jefferson Smith was significant on the local, state, or national level. Therefore, the Smith House is not eligible for listing under Criterion B.

The Smith House has undergone a loss of integrity due to replacement siding and roof materials, alterations to some original window openings, and the removal of other historic materials. It stands as a common and unexceptional example of its style. Higher style examples of the Four-square type can be found in the NRHP listed Chancery Hill Historic District and South Park Historic District located approximately one mile to the northwest. The Smith House is therefore not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

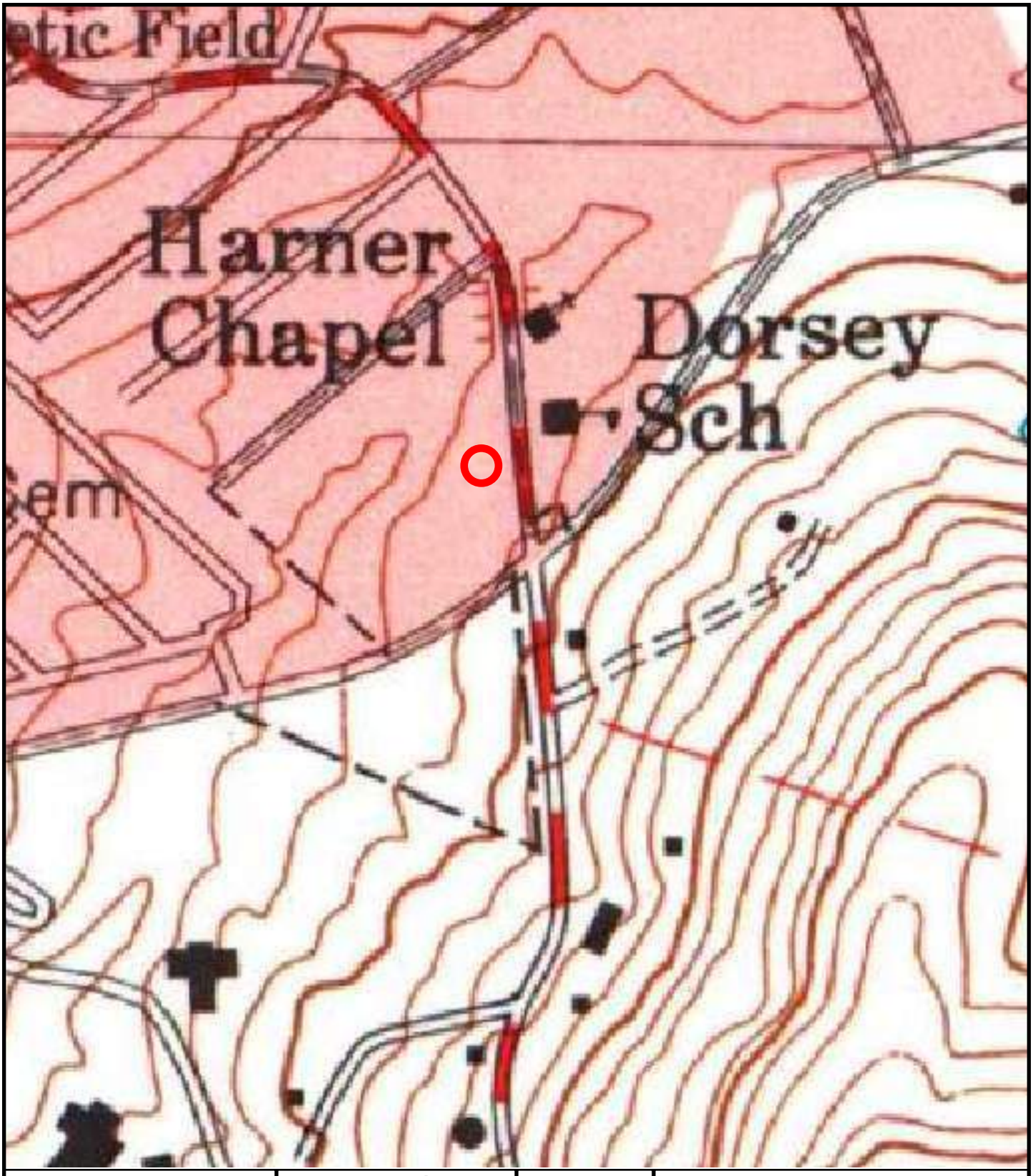
NAME Smith House **SITE#** MG-2649



Photograph 1. East and south elevations, facing northwest (Markosky 2018-12-04)



Photograph 2. East and north elevations, facing southwest (Markosky 2018-12-04)



Feet
0 300 600

Legend
Approximate Location of Historic Structure

N
W E
S

USGS Map
MG-2649
Smith House (1436 Dorsey Avenue)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2649
Smith House (1436 Dorsey Avenue)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address	Common/Historic Name/Both	Field Survey #	Site # *(SHPO Only)*
1451 Dorsey Avenue	○ ○ ◉ Wonder Bread Outlet (historic) / Atomic Grill (present)		MG-2650
Town or Community	**County**	**Negative No.**	**NR Listed Date**
Morgantown	Monongalia		
Architect/Builder	**Date of Construction**	**Style**	
	1974	Commercial	
Exterior Siding/Materials	**Roofing Material**	**Foundation**	
Metal - Aluminum	Metal - Aluminum	Concrete - Block	
Property Use or Function **Residence** ○ **Commercial** ◉ **Other** ○	**UTM#** 17 S 590599 E / 4384770 N	 Photograph 1. MG-2650 / Atomic Grill, main entrance, facing northeast	
Survey Organization & Date The Markosky Engineering Group, February 5, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2650

Site No.

N

Present Owners	Owners Mailing Address
MDRWV LLC Phone #	P.O. Box 543 Morgantown, WV 26507

Describe Setting

See continuation sheet.

0.82 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 8 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Atomic Grill **SITE#** MG-2650

MG-2650 / Atomic Grill is located on the east side of Dorsey Avenue immediately northeast of its intersection with Greenbag Road. The commercial building, which recently functioned as a restaurant and commercial garage, is located in an area of mixed single family and multi-unit residences and commercial development approximately 1.60 miles southeast of the city of Morgantown.

The Atomic Grill is a 1974 steel-frame commercial building clad with standing seam metal panels and resting on a concrete block foundation (Photographs 1 and 2). The main portion of the L-shaped building is a steel frame structure capped by a side gable roof with an eight bay garage for commercial trucks. A storefront entrance projects from the southeast elevation with plate glass walls and a flat roof with covered in standing seam metal. The building is surrounded by a parking lot.

The Atomic Grill was constructed in 1974 as the Wonder Bread Outlet (Morgantown Dominion-Post 1975). In the early 2010s, the building was re-purposed as the Atomic Grill restaurant. No information was recovered linking the Atomic Grill or the Wonder Hostess Bakery Outlet to events significant on the local, state, or national level. Therefore, the building is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the building was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Atomic Grill stands as a common and unexceptional example of late mid-century roadside commercial architecture. It does not possess the architectural merit or high artistic value to be considered eligible for listing under Criterion C. The building has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

Morgantown Dominion-Post
1975 "Was Our Foresight as Good as Hindsight." *Morgantown Dominion-Post*. January 30, 1975, Progress Edition, page 3.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Atomic Grill **SITE#** MG-2650



Photograph 1. Main entrance, facing northeast (Markosky 2019-02-05)



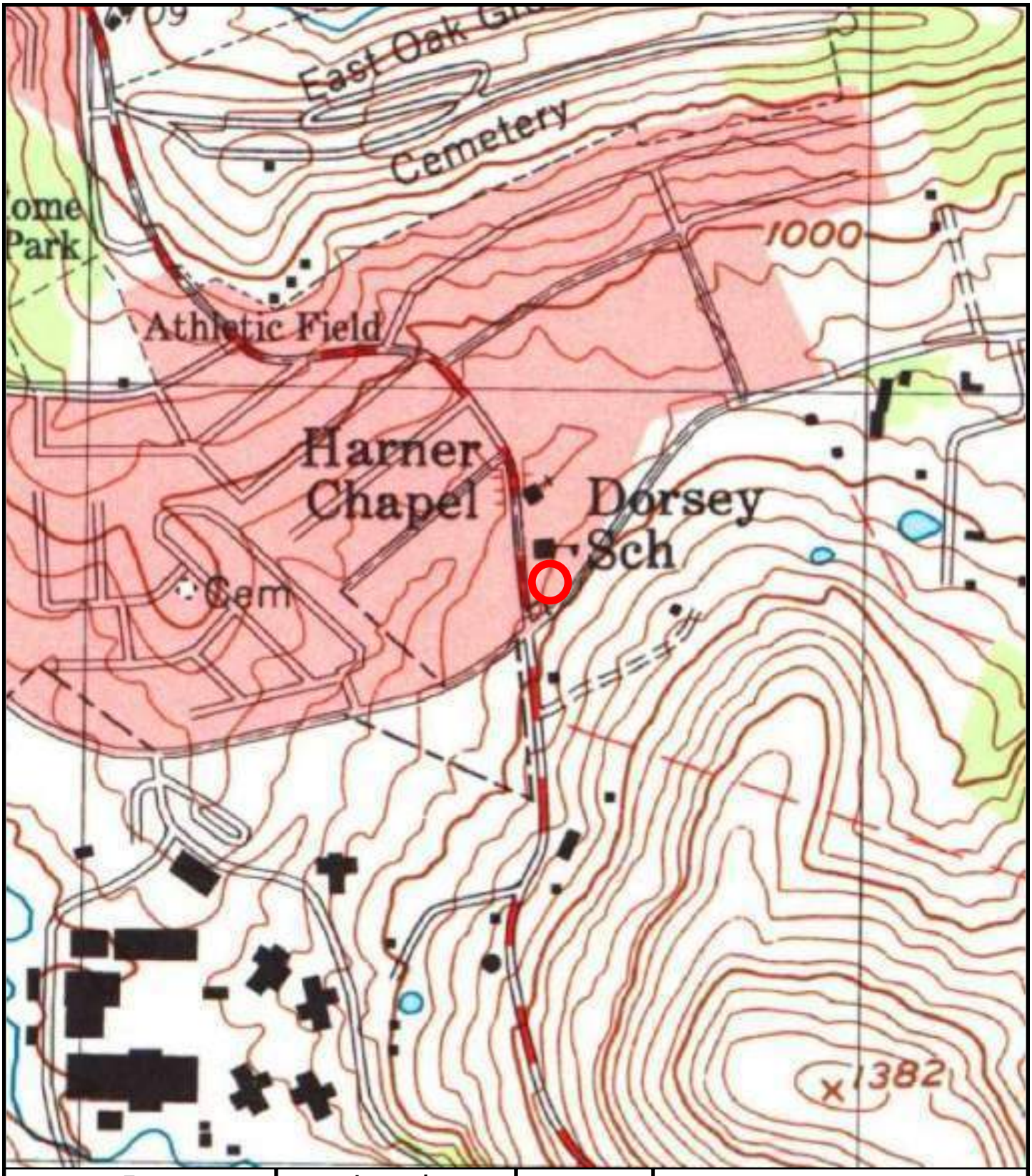
Photograph 2. Dining area, facing west (Markosky 2019-02-05)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Atomic Grill **SITE#** MG-2650



Photograph 3. Garage bays, facing north (Markosky 2019-02-05)



Feet

0 500 1,000

Legend

Location of Historic Structure

N

W E

S

USGS Map
MG-2560
Atomic Grill (1451 Dorsey Avenue)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2560
Atomic Grill (1451 Dorsey Avenue)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 1433 Dorsey Avenue	**Common/Historic Name/Both** ○ ◉ ○ Dorsey School	**Field Survey #**	**Site # *(SHPO Only)*** MG-2651
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1920	**Style** Classical Revival	
Exterior Siding/Materials Brick	**Roofing Material** Asphalt - Shingles	**Foundation** Limestone	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉	**UTM#** 17 S 59050579 / 4384799	 Photograph 1. MG-2651 / Dorsey School, facing northeast	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2651

Site No.

N

Present Owners	Owners Mailing Address
Dorsey School Phone #	13 South High Street, Morgantown, WV 26505

Describe Setting

See continuation sheet.

1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 9 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No**

If yes, describe

Alterations include the removal of original character defining elements.

Additions ◉ **Yes** ○ **No**

If yes, describe

A non-historic addition has been appended to the rear (east) elevation.

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Dorsey School **SITE#** MG-2651

MG-2651 (Dorsey School) is located on the east side of Dorsey Avenue approximately 320 feet north of its intersection with Route 857 (Greenbag Road). The school is located in an area of mixed single family and multi-unit residences and commercial development approximately 1.58 miles southeast of the city of Morgantown.

The Dorsey School is a one-story ca. 1920 Classical Revival school house clad with American common bond brick walls (Photographs 1-3). The hipped roof is covered in asphalt shingle. Fenestration consists of replacement one-over-one vinyl sash windows, fixed vinyl sash windows, and louvered metal windows. The windows feature simple brick sills. A non-historic one-story concrete block rear addition with a flat roof is appended to the east elevation. A deeply recessed entrance on the façade (west elevation) features a segmental arch entry accented with decorative brickwork. The modern replacement door is surrounded by a modern simple transom and what are likely original sidelights.

The Dorsey School was named for the Dorsey family who were some of the first settlers within this area of Monongalia County south of Morgantown along Coburns Creek (Core 1976:381). The land on which the school stands was likely once owned by members of the Dorsey family. A school house first appears in the vicinity of the present Dorsey School in an 1886 map of the Morgan District of Monongalia County (Figure 1) (Lothrop, et. al 1886). The Dorsey School House No. 1 was located on the east side of the Kingwood, Morgantown, and West Union Turnpike (modern day Kingwood Pike) at its intersection with modern day Luckey Lane. This was likely a frame, one-room schoolhouse. A 1902 topographic map shows a structure in the vicinity of the Dorsey School House No. 1 although it is not labeled as a school (USGS 1902) (Figure 2). A later topographic map from 1925 illustrates a school on the east side of Kingwood Pike south of Luckey Lane (Figure 3) (USGS 1925). A ca. 1926 photograph shows students posed in front of the school (Photograph 4) (WVU 1926). Today, the school houses the Monongalia County Head Start.

The Dorsey School is associated with the education history of Monongalia County. However, scant information was recovered concerning the school and its role in what was a particularly rural area of Monongalia County on the outskirts of Morgantown. No definitive date of construction was recovered. A small anecdote in the *175th Anniversary of the Formation of Monongalia County, West Virginia* published by the Monongalia County Historical Society in 1954 indicates that at the turn of the 20th century the school house was used for Methodist revival meetings. The success of these meetings prompted the construction of Harner Chapel (MG-1332) located immediately to the north on the north side of Luckey Lane ca. 1914 (The Monongalia Historical Society 1954:82). It is possible the school house referenced in the 1886 map was a more rudimentary frame one room school house and the more substantial brick Dorsey School was built at a later date. However, without more corroborating information the Dorsey School cannot be placed in the greater context of the educational history of Monongalia County.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Dorsey School **SITE#** MG-2651

The Dorsey School is associated with the education history of Monongalia County. However, scant information was recovered concerning the school and its role in a rural area of Monongalia County on the outskirts of Morgantown. Therefore, the school is not eligible for listing under Criteria A.

While the school was likely built on land owned and possibly given by the Dorsey family, the school itself is not associated with any members of the Dorsey family. Further, no information was recovered suggesting the school was associated with other individuals significant on the local, state, or national level. Therefore, the school is not eligible for listing under Criteria B. The Dorsey School stands as a common and unexceptional example of educational architecture in Monongalia County. It has undergone alterations and additions including a large rear addition and the removal of original character defining elements. The Dorsey School does not possess high artistic value, represent the work of a master, or embody the distinctive characteristics of a type, period, or method of construction. Therefore, it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

References

Core, Earl L.
1976 *The Monongalia Story: A Bicentennial History. Volume II: Pioneers.* McClain Printing Company, Parsons, West Virginia.

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

Lathrop, J.M and H.C. Penny, W.R. Proctor
1886 *Morgan Magisterial District, Monongalia County, West Virginia, Blacksville, Wise, Lowsville, etc.* D.J. Lake and Company, Philadelphia, Pennsylvania.

The Monongalia Historical Society
1954 *The 175th Anniversary of the Formation of Monongalia County, West Virginia and other Relative Historical Data.* The Monongalia Historical Society, Morgantown, West Virginia.

United States Geological Survey (USGS)
1902 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

1925 Morgantown, West Virginia topographic map, 15 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Dorsey School **SITE#** MG-2651

References (continued)

West Virginia University (WVU)
1926 "Dorsey School, Morgan District, Monongalia County." West Virginia History OnView. Website at https://wvhistoryonview.org/catalog/038226. Accessed December 13, 2018.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Dorsey School **SITE#** MG-2651



Photograph 1. Façade and south elevation, facing northeast (2018-12-05)



Photograph 2. Rear addition, facing southwest (2018-12-05)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

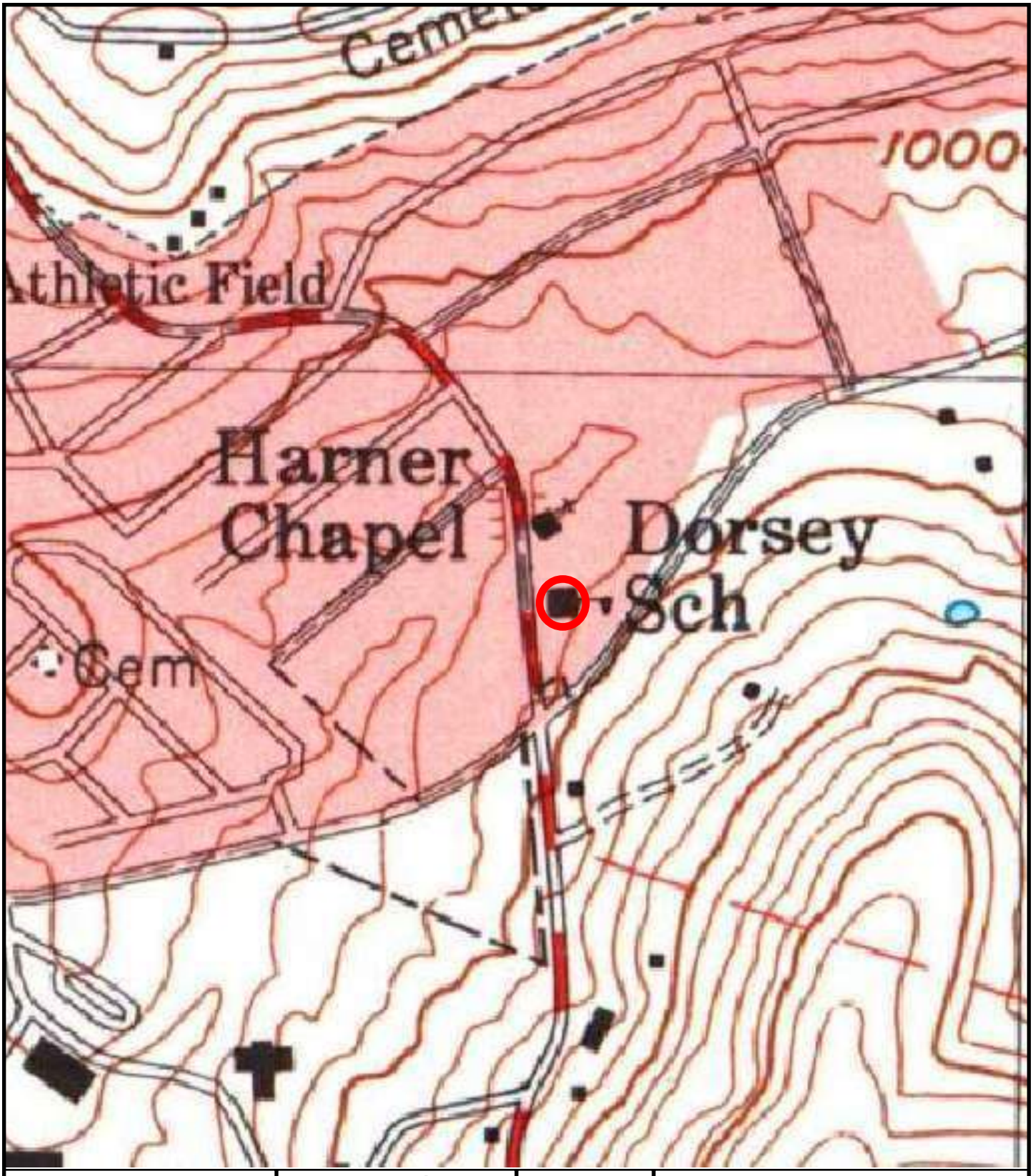
NAME Dorsey School **SITE#** MG-2651



Photograph 3. Recessed entrance fronting Dorsey Avenue, facing east (Google Earth 2018)



Photograph 4. School children at entrance of the Dorsey School, ca. 1926 (WVU 1926)



Feet
0 375 750

Legend

Location of Historic Structure

N
W E
S

USGS Map
MG-2651
Dorsey School

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

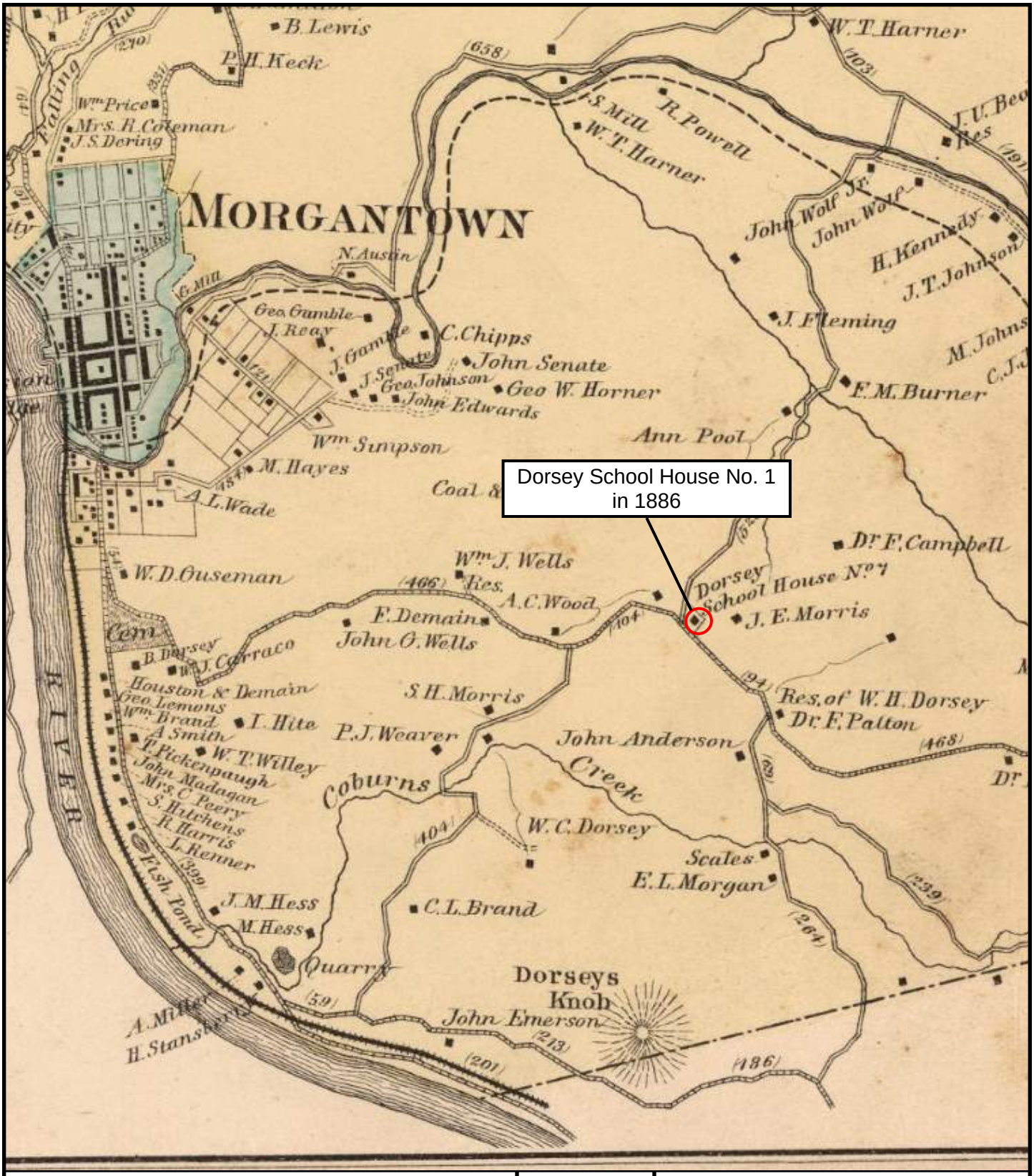
N
W E
S

Site Map
Dorsey School

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018

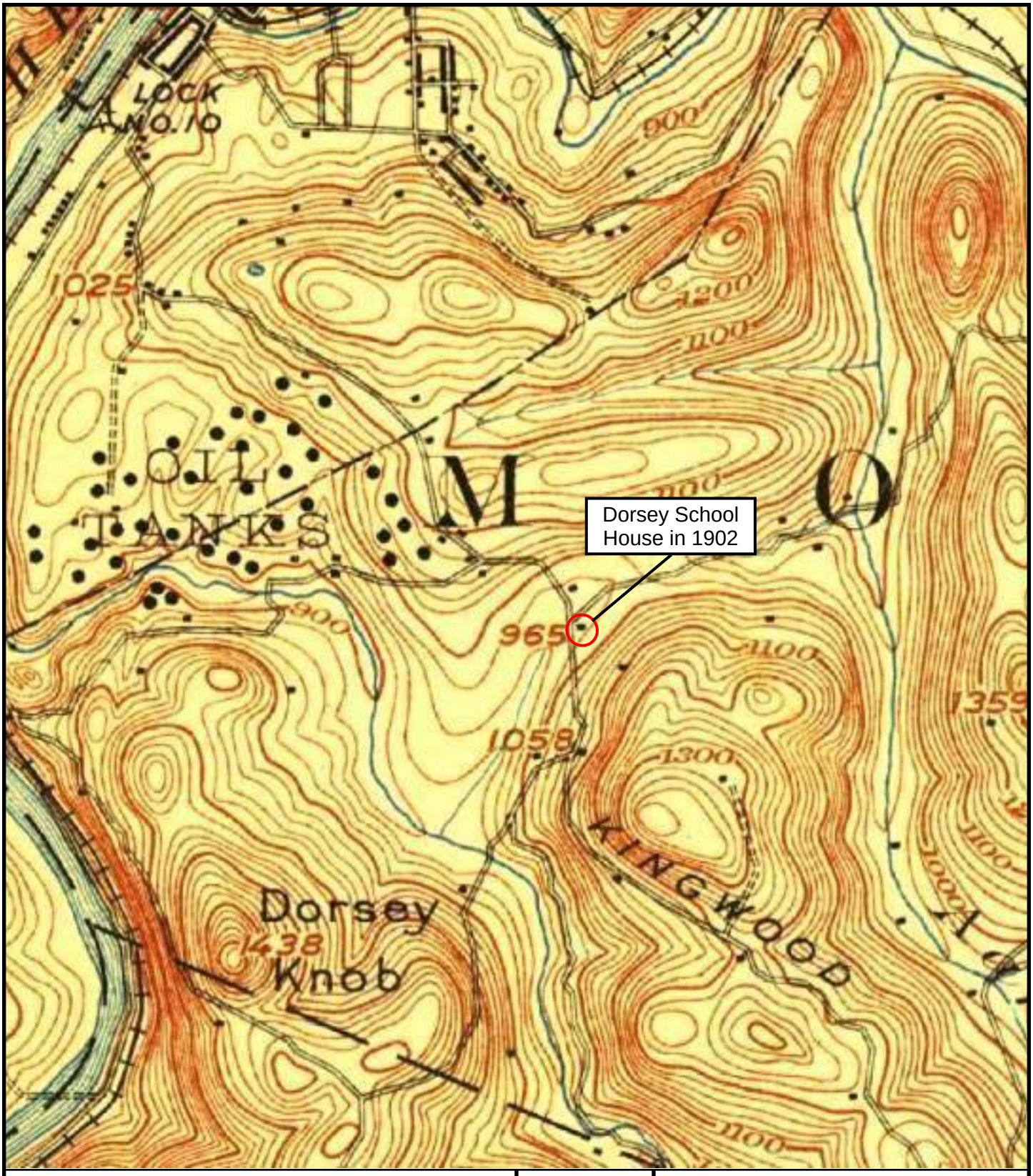


*Not to Scale.

Figure 1. Location of Former Dorsey School House No. 1

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Lothrop, et. al 1886



*Not to Scale.

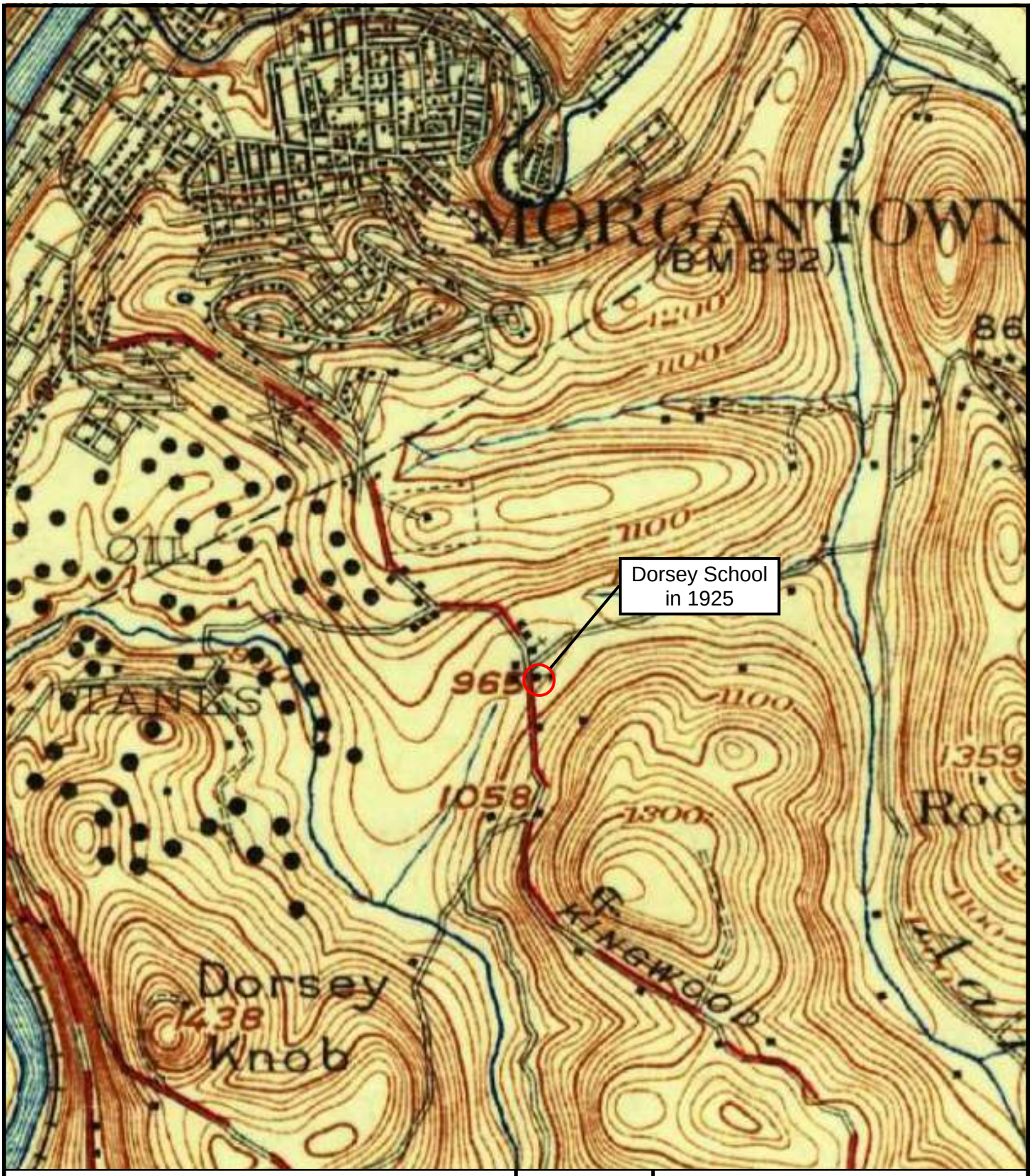
N
W E
S

Figure 2. Location of Former Dorsey School House in 1902

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1902



*Not to Scale.

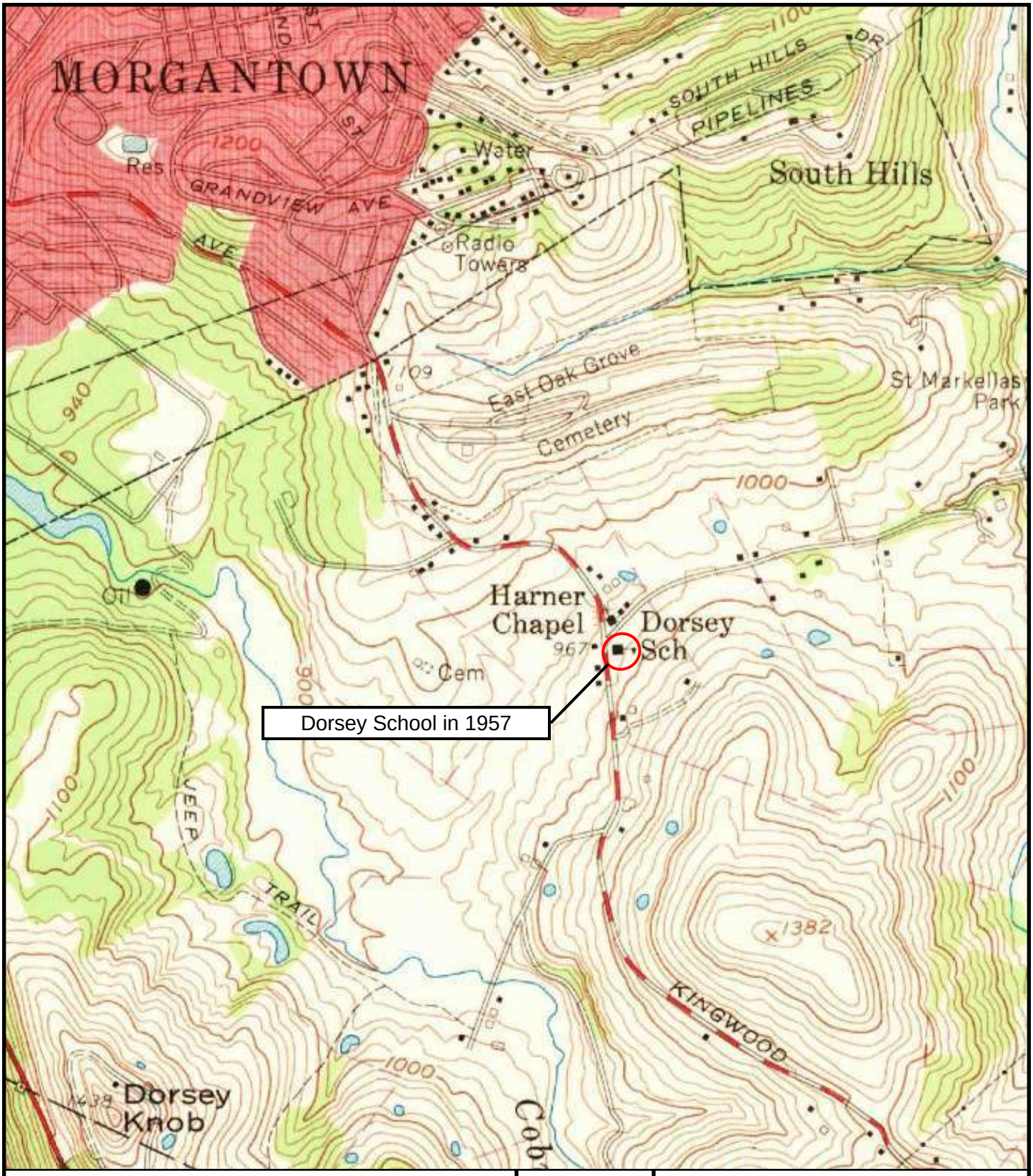
N
W E
S

Figure 3. Location of MG-2651 / Dorsey School in 1925

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1925



*Not to Scale.

N
W E
S

Figure 3. Location of MG-2651 / Dorsey School in 1957

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1957



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 1432 Dorsey Avenue	**Common/Historic Name/Both** ◉ ○ ○ House at 1432 Dorsey Avenue	**Field Survey #**	**Site # *(SHPO Only)*** MG-2652
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1915	**Style** Bungalow - dormer front	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt - Shingles	**Foundation** Stone - Rock Faced	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590546 / 4384825	 Photograph 1. MG-2652 / House at 1432 Dorsey Avenue, facing southwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South **Part of What Survey/FR#** Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2652

Site No.

N

Present Owners	Owners Mailing Address
Edward Holipsky Phone #	1432 Dorsey Avenue, Morgantown, WV 26501

Describe Setting

See continuation sheet.

.38 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1.5 **Stories** 2 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 1432 Dorsey Avenue **SITE#** MG-2652

MG-2652 / House at 1432 Dorsey Avenue is located on the west side of Dorsey Avenue immediately west of its intersection with Luckey Lane. The house is located within an area of mixed single family and multi-unit housing and commercial development north of Greenbag Road, approximately 1.58 miles southwest of the city of Morgantown.

The house at 1432 Dorsey Avenue is a ca. 1915 one-and-a-half-story Bungalow style dwelling covered in vinyl siding and synthetic wood shingle (Photograph 1). The house rests on a rock faced concrete block foundation and is capped by a side gable roof covered in asphalt shingle. The roof is pierced by an interior central chimney and a front gable dormer window is located on the façade (east elevation). The façade features a partially enclosed integral shed roof porch resting on a concrete block foundation. Fenestration consists of simulated three-over-one vinyl sash windows and sliding vinyl sash windows in the basement level.

A one-bay garage capped by a front gable asphalt shingle roof and covered in vinyl siding is located immediately south of the house (Photograph 2). A shed roof connects the garage and house.

No information was recovered linking the house at 1432 Dorsey Avenue to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 1432 Dorsey Avenue lacks integrity because it has undergone alterations with replacement siding, windows, and roofing as well as a partially enclosed front porch. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

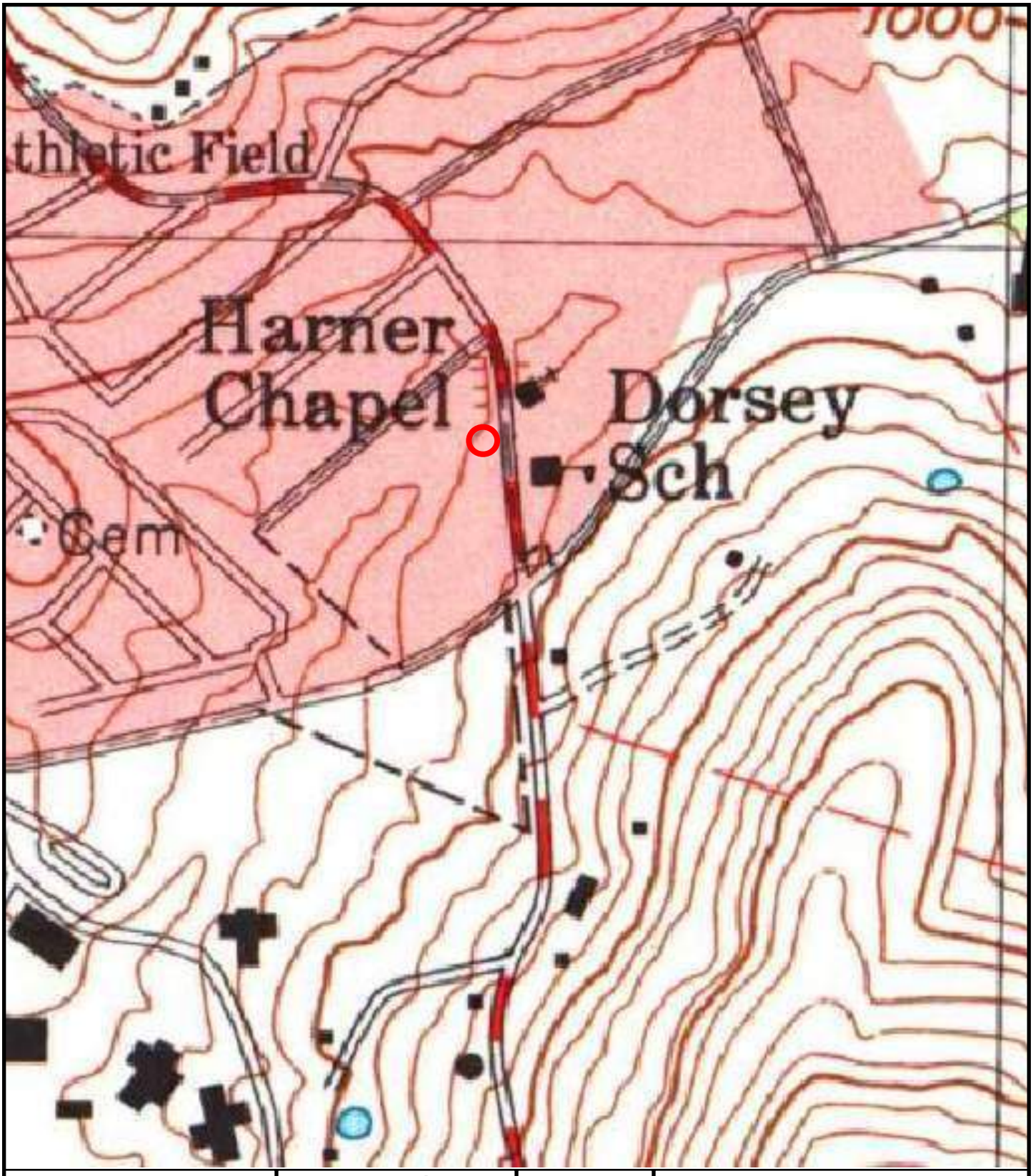
NAME House at 1432 Dorsey Avenue **SITE#** MG-2652



Photograph 1. House showing enclosed porch, facing southwest (Markosky 2018-12-05)



Photograph 2. House and garage, facing northwest (Markosky 2018-12-05)



Feet
0 375 750

Legend
Approximate Location of Historic Structure

N
W E
S

USGS Map
MG-2652
House at 1432 Dorsey Avenue

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2652
House at 1432 Dorsey Avenue

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 102 Luckey Lane	**Common/Historic Name/Both** ◉ ○ ○ House at 102 Luckey Lane	**Field Survey #**	**Site # *(SHPO Only)*** MG-2653
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1940	**Style** Other - Minimal Traditional	
Exterior Siding/Materials Metal - Aluminum	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590604 E / 4384877 N	 Photograph 1. MG-2653 / House at 102 Luckey Lane, facing north	
Survey Organization & Date The Markosky Engineering Group, December 5, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2653

Site No.

N

Present Owners
Harner Chapel United Methodist Church

Phone #

Owners Mailing Address
102 Luckey Lane
Morgantown, WV 26505

Describe Setting
See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present)
2 **Stories** 3 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations
◉ **Yes** ○ **No**
If yes, describe
See continuation sheet.

Additions
◉ **Yes** ○ **No**
If yes, describe
See continuation sheet.

Describe All Outbuildings
None.

(Use Continuation Sheets)

Statement of Significance
See continuation sheet.

(Use Continuation Sheets)

Bibliographical References
See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group
Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 102 Luckey Lane **SITE#** MG-2653

MG-2653 / House a 102 Luckey Lane is located on the northwest side of Luckey Lane approximately 237 feet northeast of its intersection with Dorsey Avenue. The house is located within an area of single family and multi-unit residences and commercial development northwest of Greenbag Road.

The house at 102 Luckey Lane is a ca. 1940 one-and-a-half story Minimal Traditional style dwelling covered in aluminum siding and capped by a side gable roof covered in asphalt shingle. The roof is pierced by one exterior brick chimney. The house rests on a concrete block foundation and fenestration consists of fixed and sliding vinyl sash windows. A partial width, second story addition supported by brick piers has been appended to the façade (southeast elevation). The addition is capped by a front gable roof covered in asphalt shingle. A two-story, full width addition has been appended to the rear (northwest) elevation. Two shed roof porch additions resting on concrete block foundations are appended to the northeast and southwest elevations.

No information was recovered linking the house at 102 Luckey Lane to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 102 Luckey Lane lacks integrity because it has undergone alterations (including replacement siding, roofing, and windows) and multiple additions (including a second story addition on the façade). For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

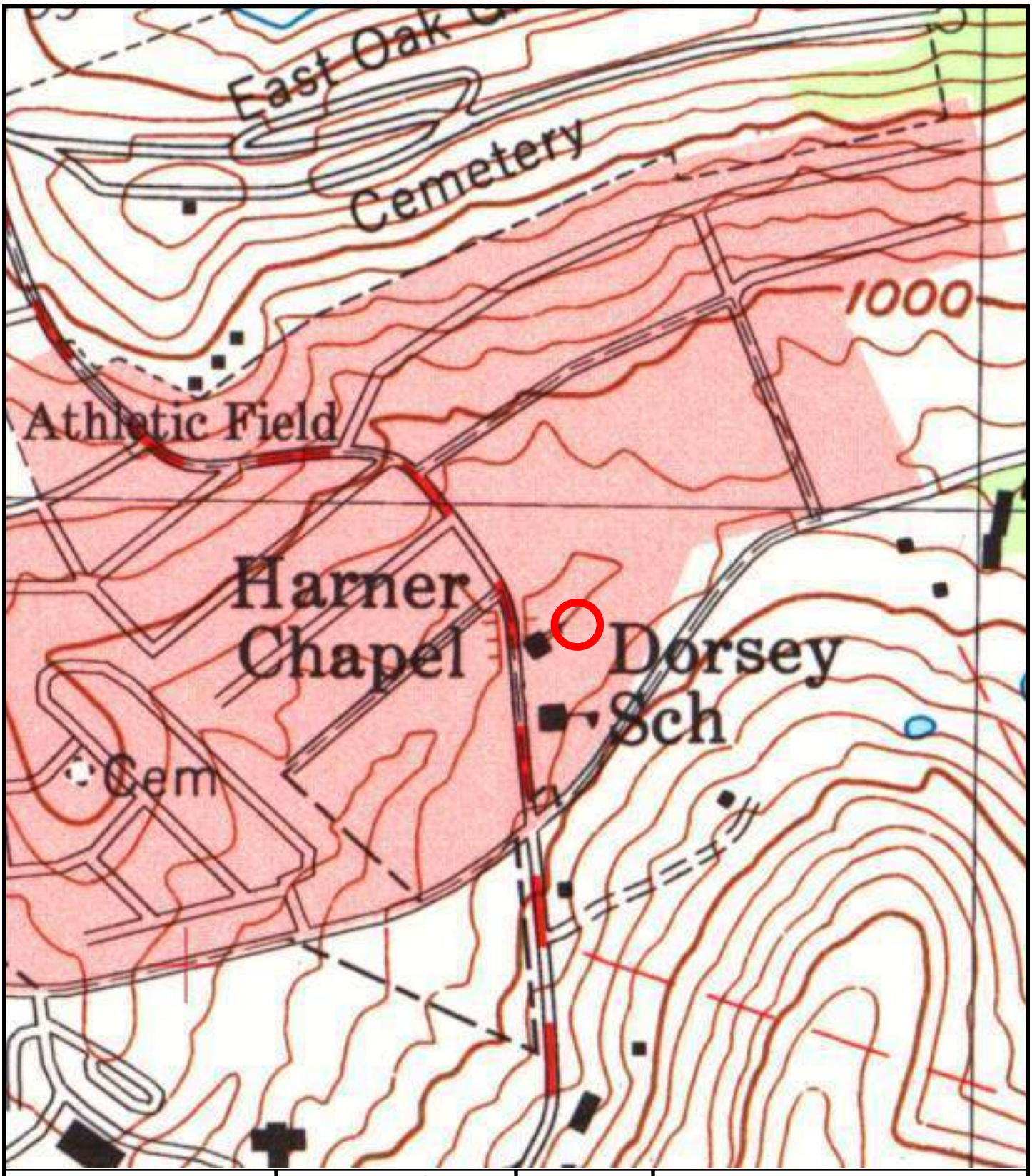
United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 102 Luckey Lane **SITE#** MG-2653



Photograph 1. House with second story enclosed addition, facing northeast (Markosky 2018-12-05)



Feet
0 375 750

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2653
House at 102 Luckey Lane

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2653
House at 102 Luckey Lane

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 104 Luckey Lane	**Common/Historic Name/Both** ◉ ○ ○ House at 104 Luckey Lane	**Field Survey #**	**Site # *(SHPO Only)*** MG-2654
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1940	**Style** Minimal Traditional	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590616 E / 4384887 N	 Photograph 1. MG-2654 / House at 104 Luckey Lane, facing north	
Survey Organization & Date The Markosky Engineering Group, December 5, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No. MG-2654

N

Present Owners	Owners Mailing Address
Smith Rentals LLC Phone #	426 Drummond Street Morgantown, WV 26505

Describe Setting

See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 4 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Additions ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME House at 104 Luckey Lane **SITE#** MG-2654

MG-2654 / House at 104 Luckey Lane is located on the northwest side of Luckey Lane approximately 266 feet northeast of its intersection with Dorsey Avenue. The house is located within an area of single family and multi-unit residences and commercial development northwest of Greenbag Road.

The house at 104 Luckey Lane is a ca. 1940 one-story Minimal Traditional style dwelling clad in vinyl siding and resting on a concrete block foundation. The house is capped by a side gable roof covered in asphalt shingle and pierced by an exterior brick chimney. Fenestration consists of replacement one-over-one and fixed vinyl sash windows. A shed roof porch supported by metal posts has been appended to the façade (southeast elevation), while a one-bay garage capped by a side gable roof has been appended to the northeast elevation.

No information was recovered linking the house at 104 Luckey Lane to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 104 Luckey Lane lacks integrity because it has undergone alterations and additions including replacement siding and roof materials, alterations or original window openings, and a one-bay garage addition. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

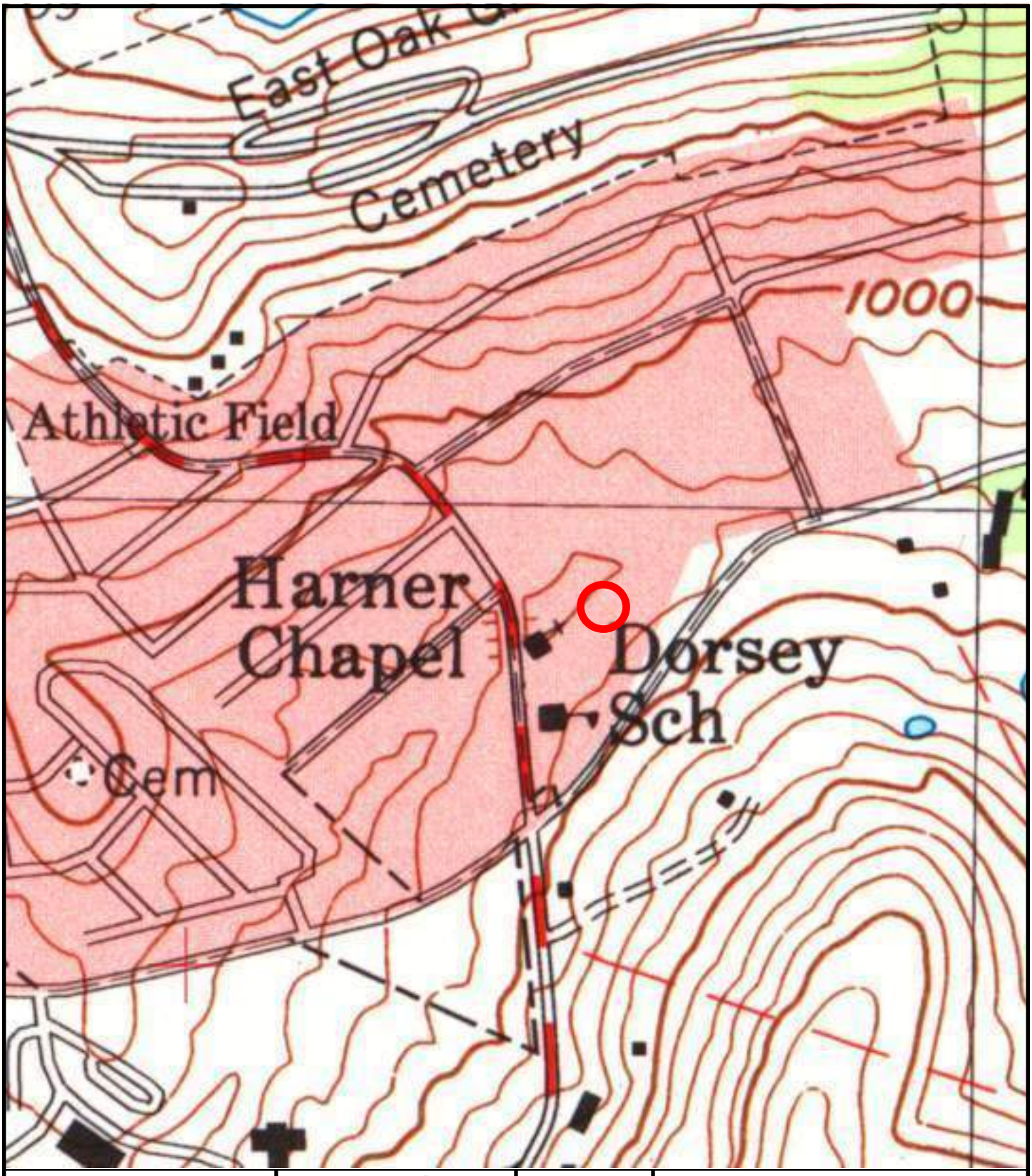
United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

NAME House at 104 Luckey Lane **SITE#** MG-2654



Photograph 1. Façade and southwest elevation, facing northeast (Markosky 2018-12-05)



Feet
0 375 750

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2654
House at 104 Luckey Lane

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2654
House at 104 Luckey Lane

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 1201 – 7304 Mountain View Manor	**Common/Historic Name/Both** ○ ○ ◉ Mountain View Manor	**Field Survey #**	**Site # *(SHPO Only)*** MG-2655
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1970	**Style** Modern	
Exterior Siding/Materials Brick	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590443 / 4384811	 Photograph 1. MG-2655 / Mountain View Manor, representative building, northwest elevation with glass entrance, facing southwest	
Survey Organization & Date The Markosky Engineering Group, February 5, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2655

Site No.

N

Present Owners	Owners Mailing Address
Multiple Owners Phone #	

Describe Setting

See continuation sheet.

2.4 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 3 **Stories** 5 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Mountain View Manor **SITE#** MG-2655

MG-2655 / Mountain View Manor is located on the southwest side of Dorsey Avenue approximately 0.13 miles north of the intersection of Dorsey Avenue and Greenbag Road. The multi-unit housing complex is located in an area of mid-century residential development with non-historic residential and commercial development to the west. A handful of early 20th century dwellings are located south of Mountain View Manor. The complex is located approximately 1.55 miles southeast of Morgantown.

Mountain View Manor is a three-story, multi-unit housing complex constructed ca. 1970 comprising seven rectangular buildings, each with 10 units. In each building, four units face the northwest elevation, four units face the southeast elevation, and two additional units are included on the ground level of the southeast elevation (Photographs 1-3). Each building features a one-bay, central entrance with segmented plate glass panels from the floor to ceiling on their northwest elevations. Entrances on the southeast elevations are simple doors with one plain side light. The three-story buildings with exposed basements are covered in applied stretcher bond brick and capped by side gable roofs covered in asphalt shingle. The roofs feature a slight overhang in the gable ends and eaves. Fenestration consists of tripartite metal sash sliding glass windows. Each unit features an integrated porch, either on the northwest or southeast elevation, with a simple metal balustrade, floor to ceiling plate glass windows, and a door for access. Unit 1, located at the northeast end of the complex, contains offices on the ground floor while the remaining units are residential.

No information was recovered linking Mountain View Manor to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the housing units were historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. Mountain View Manor stands as a common and unexceptional example of late mid-century multi-unit residential architecture. It does not possess the architectural merit necessary to be considered eligible under Criterion C. The housing development has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Mountain View Manor **SITE#** MG-2655



Photograph 1. Representative building, northwest elevation, facing southwest (Markosky 2019-02-05)



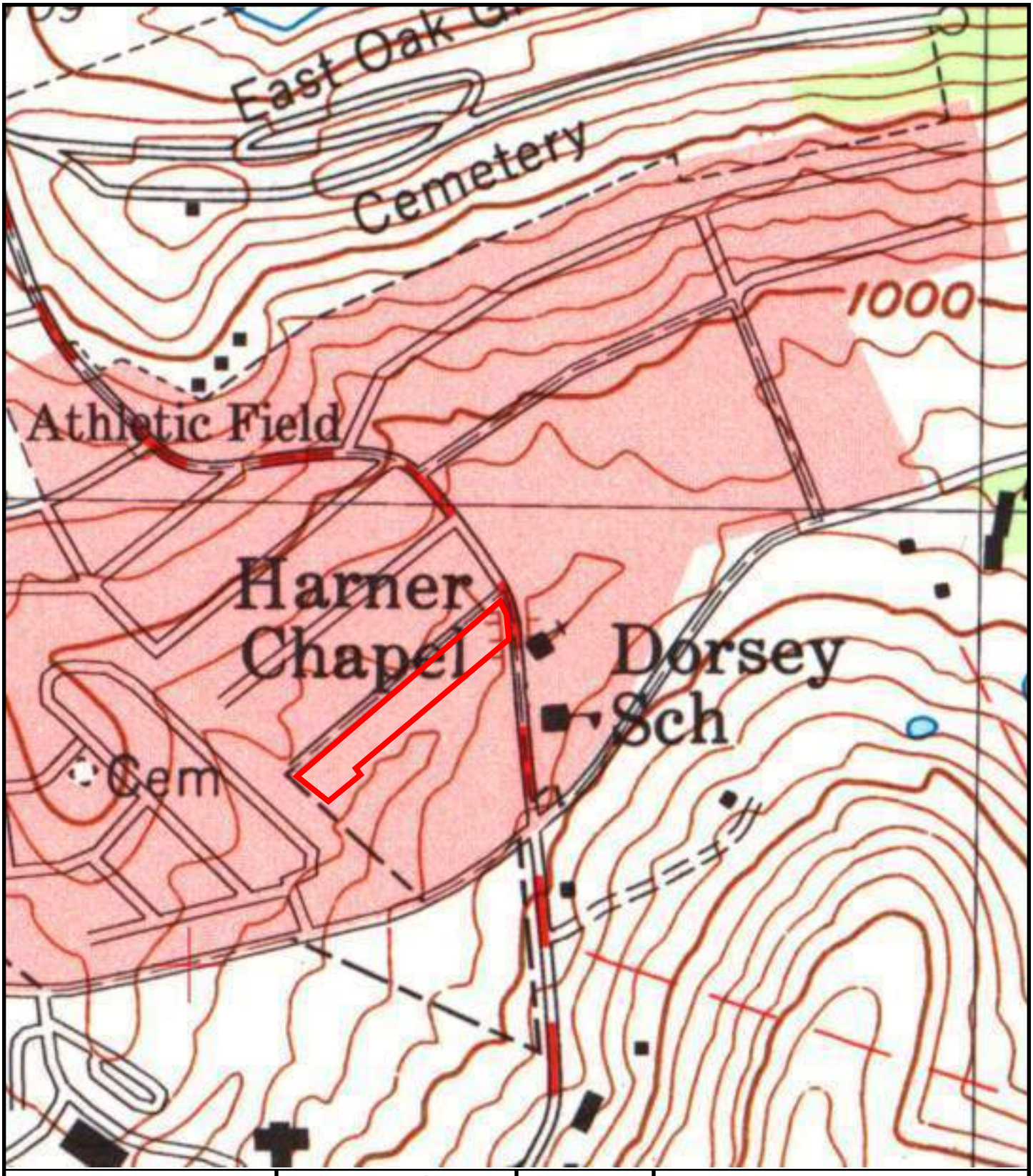
Photograph 2. Representative building, southeast elevation, facing north (Markosky 2019-02-05)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Mountain View Manor **SITE#** MG-2655



Photograph 3. Overview of buildings, facing west (Markosky 2019-02-05)



Feet

0 375 750

Legend

Location of Historic Structure

N

W E

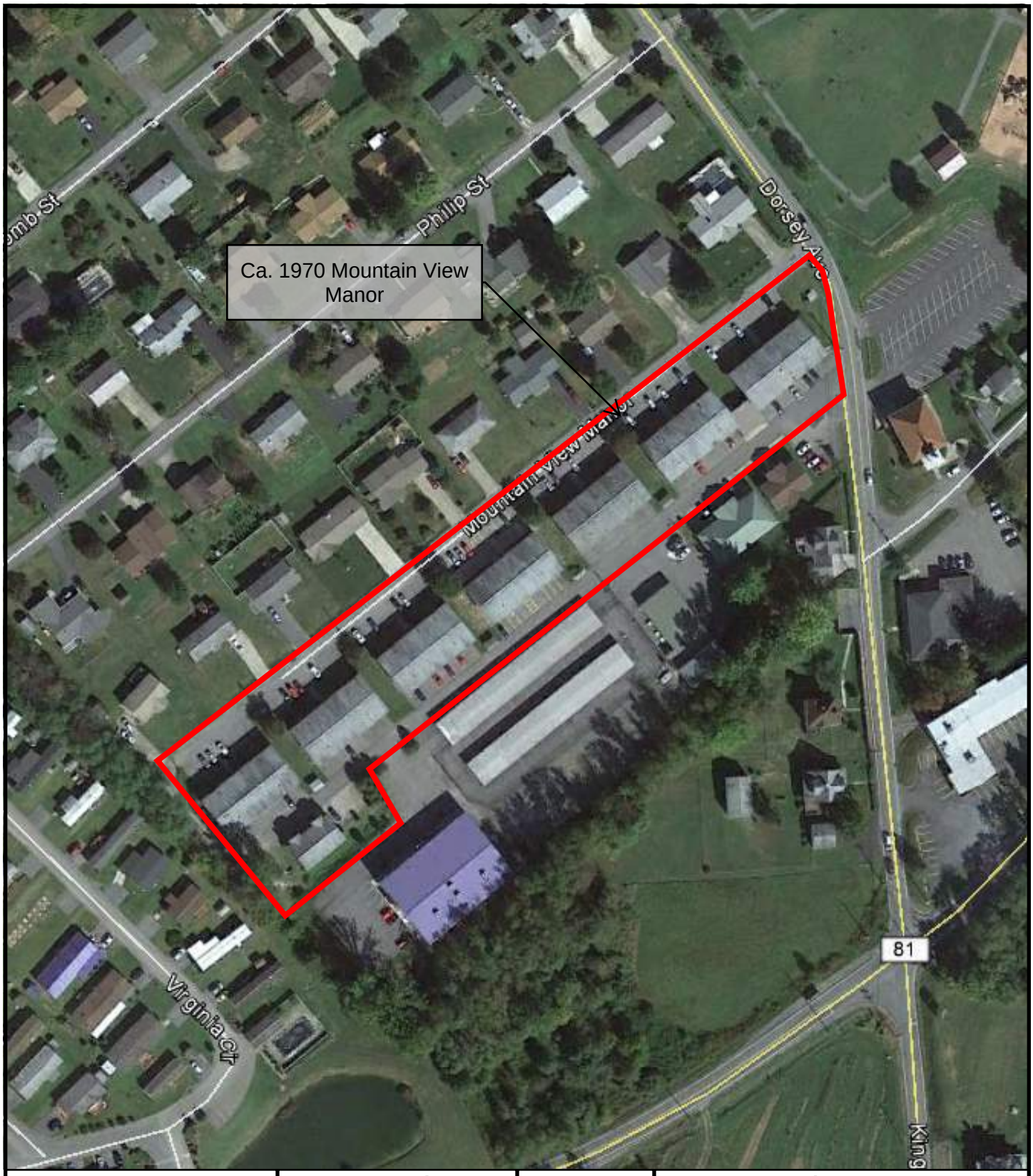
S

USGS Map
MG-2655
Mountain View Manor
1201 – 7304 Mountain View Manor

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2655
Mountain View Manor
1201 – 7304 Mountain View Manor

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 500 Parkway Drive	**Common/Historic Name/Both** ◉ ○ ○ House at 500 Parkway Drive	**Field Survey #**	**Site # *(SHPO Only)*** MG-2656
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1970	**Style** Modern Ranch	
Exterior Siding/Materials Brick, Synthetics - VInyl	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590509 E / 4384931 N	 Photograph 1. MG-2656 / House at 500 Parkway Drive, facing north	
Survey Organization & Date The Markosky Engineering Group, February 5, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2656

Site No.

N

Present Owners	Owners Mailing Address
Jack and Barbara Johns Phone #	500 Parkway Drive Morgantown, WV 26501

Describe Setting

See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 4 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe**

Alterations include replacement siding material and replacement windows.

Additions ◉ **Yes** ○ **No** **If yes, describe**

A small porch addition has been appended to the rear elevation.

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 500 Parkway Drive **SITE#** MG-2656

MG-2656 / House at 500 Parkway Drive is located on the northwest side of Parkway Drive immediately west of its intersection with Dorsey Avenue. The house is located in a ca. 1970 residential development; the greater area consists of single family and multi-unit housing and commercial development approximately 1.50 miles southeast of the city of Morgantown.

The house at 500 Parkway Drive is a ca. 1970, one-story Ranch style dwelling covered in applied stretcher bond brick and vinyl siding and capped by a side gable roof covered in asphalt shingle (Photographs 1 and 2). The one-story dwelling rests on a concrete block foundation. Fenestration consists of one-over-one vinyl sash windows and a tripartite picture window on the façade (southeast elevation). The façade features a pedimented porch supported by simple columns. A partial width porch projects from the rear (northwest) elevation.

No information was recovered linking the house at 500 Parkway Drive to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

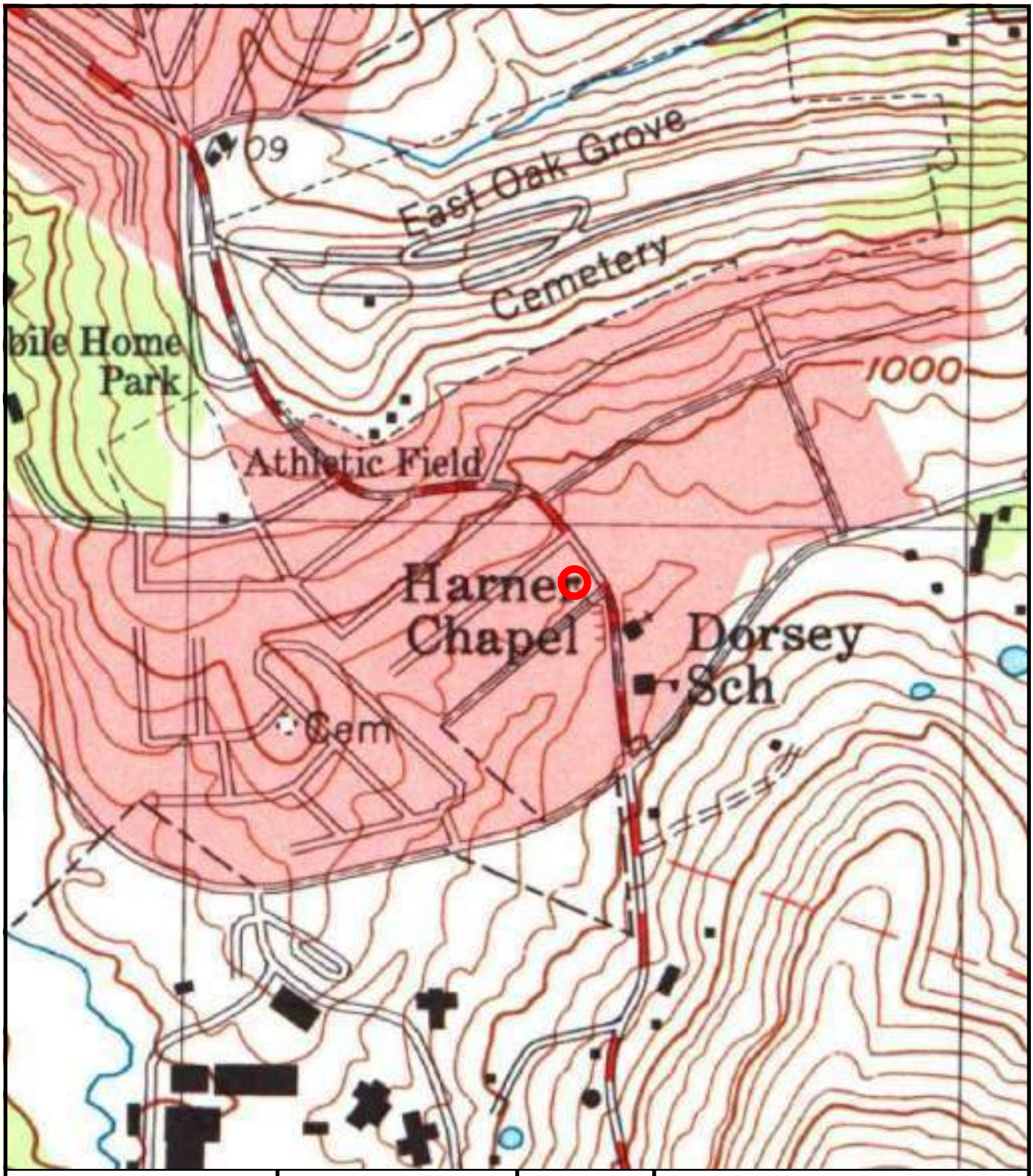
NAME House at 500 Parkway Drive **SITE#** MG-2656



Photograph 1. House and garage, facing north (Markosky 2019-02-05)



Photograph 2. Façade and northeast elevation, facing northwest (Markosky 2019-02-05)



Feet

0 500 1,000

Legend

Location of Historic Structure

N

W E

S

USGS Map
MG-2656
House at 500 Parkway Drive

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2656
House at 500 Parkway Drive

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 502 Parkway Drive	**Common/Historic Name/Both** ◉ ○ ○ House at 502 Parkway Drive	**Field Survey #**	**Site # *(SHPO Only)*** MG-2657
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1970	**Style** Modern Split Level	
Exterior Siding/Materials Metal - Aluminum, Brick	**Roofing Material** Asphalt	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590486 E / 4384915 N	 Photograph 1. MG-2657 / House at 502 Parkway Drive, facing northwest	
Survey Organization & Date The Markosky Engineering Group, February 5, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2657

Site No.

N

Present Owners	Owners Mailing Address
Karen Saffron Phone #	502 Parkway Drive Morgantown, WV 26501

Describe Setting

See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present)

1.5 **Stories** 4 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 502 Parkway Drive **SITE#** MG-2657

MG-2657 the House at 500 Parkway Drive is located on the northwest side of Parkway Drive immediately west of its intersection with Dorsey Avenue. The house is located in a ca. 1970 residential development; the greater area consists of single family and multi-unit housing and commercial development approximately 1.50 miles southeast of the city of Morgantown.

The house at 502 Parkway Drive is a ca. 1970, one-and-a-half story Modern Split-Level dwelling covered in applied stretcher bond brick and aluminum siding. The house rests on a concrete block foundation and is capped by a gable roof covered in asphalt shingle. The L-shaped house features a two-story, projecting front gable with a garage on the ground level. A one-story ell projects from the northeast elevation of the front gable section of the house. An integral porch supported by simple square posts is located within the ell. The entry door within the porch is flanked by simple sidelights. Fenestration consists of double hung aluminum sash, simulated six-over-six windows, and tripartite sliding windows.

No information was recovered linking the house at 502 Parkway Drive to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

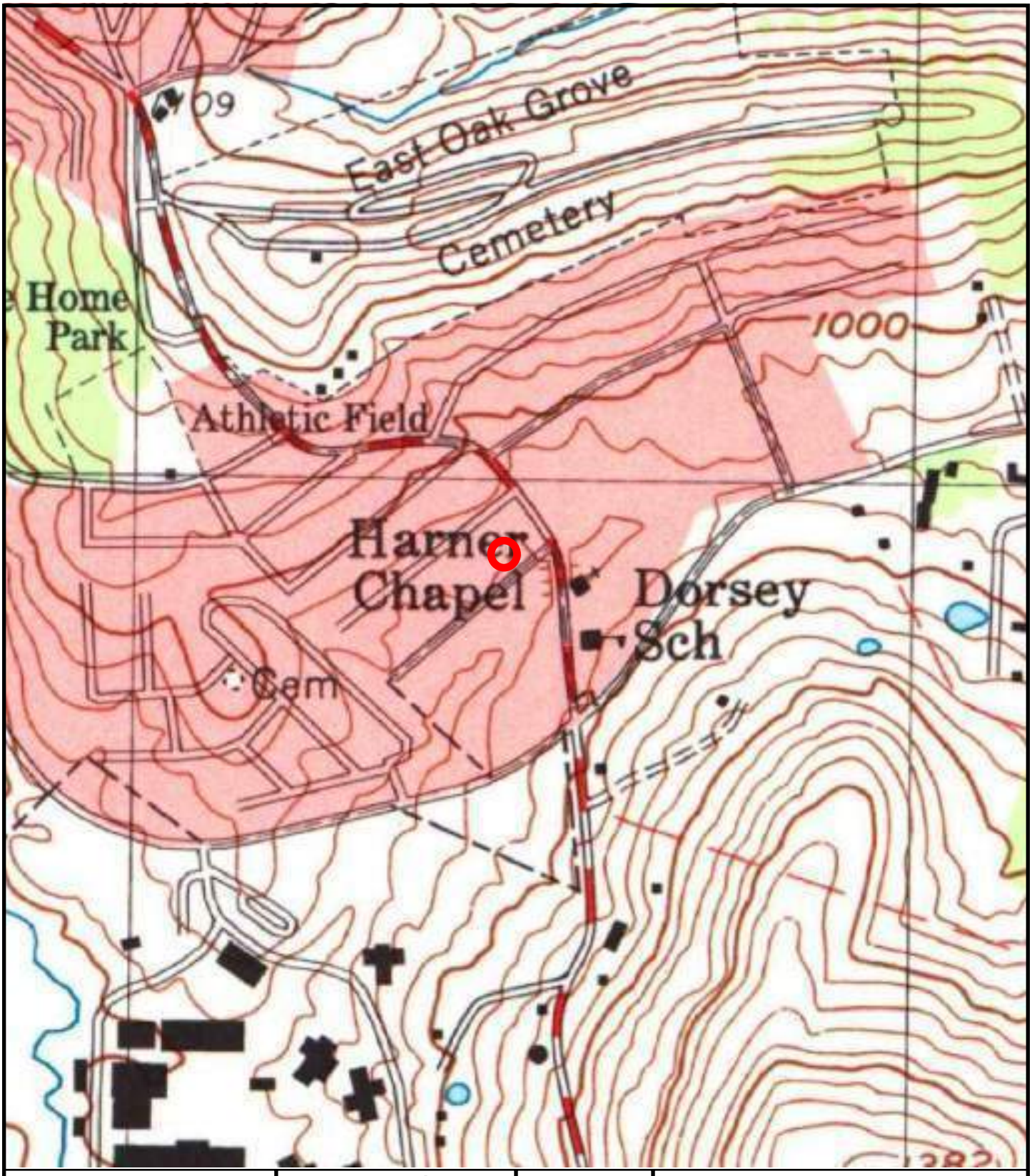
United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 502 Parkway Drive **SITE#** MG-2657



Photograph 1. Garage and ell, facing northwest (Markosky 2019-02-05)



Feet

0 500 1,000

Legend

Location of Historic Structure

N
W E
S

USGS Map
MG-2657
House at 502 Parkway Drive

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2657
House at 502 Parkway Drive

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 693 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ House at 693 Greenbag Road	**Field Survey #**	**Site # *(SHPO Only)*** MG-2658
Town or Community Morgantown Vicinity	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1955	**Style** Modern Ranch	
Exterior Siding/Materials Brick, Synthetics - VInyl	**Roofing Material** Asphalt - Shingles	**Foundation** Concrete - Block	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590851 / 4385019	 Photograph 1. MG-2658 / House at 693 Greenbag Road, facing northwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2658

Site No.

N

Present Owners	Owners Mailing Address
Raymond Travis Phone #	693 Greenbag Road, Morgantown, WV 26508

Describe Setting

See continuation sheet.

.34 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 4 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 693 Greenbag Road **SITE#** MG-2658

MG-2658 / House at 693 Greenbag Road is located on the north side of Greenbag Road immediately east of its intersection with Richard Avenue. The house is located in an area of mixed residential and commercial development approximately 1.53 miles southeast of the city of Morgantown.

The house at 693 Greenbag Road is a ca. 1955 frame Ranch style dwelling clad in applied stretcher bond brick and vinyl siding (Photograph 1). The side gable roof is covered in asphalt shingle and features overhanging eaves in the gable ends. Fenestration consists of sliding, fixed, and one-over-one metal sash windows. A partial width shed roof porch is appended to the façade (southeast elevation). An integral garage is located on the side (northeast elevation).

A ca. 1980 two-bay detached garage clad in vinyl siding and capped by a side gable roof covered in asphalt shingle is located north of the house (Photograph 2).

No information was recovered linking the house at 693 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not recommended eligible for listing under Criterion B. The house stands as a common and unexceptional example of postwar residential architecture. It is not a part of a significant postwar residential subdivision and does not possess the architectural merit necessary to be considered eligible under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

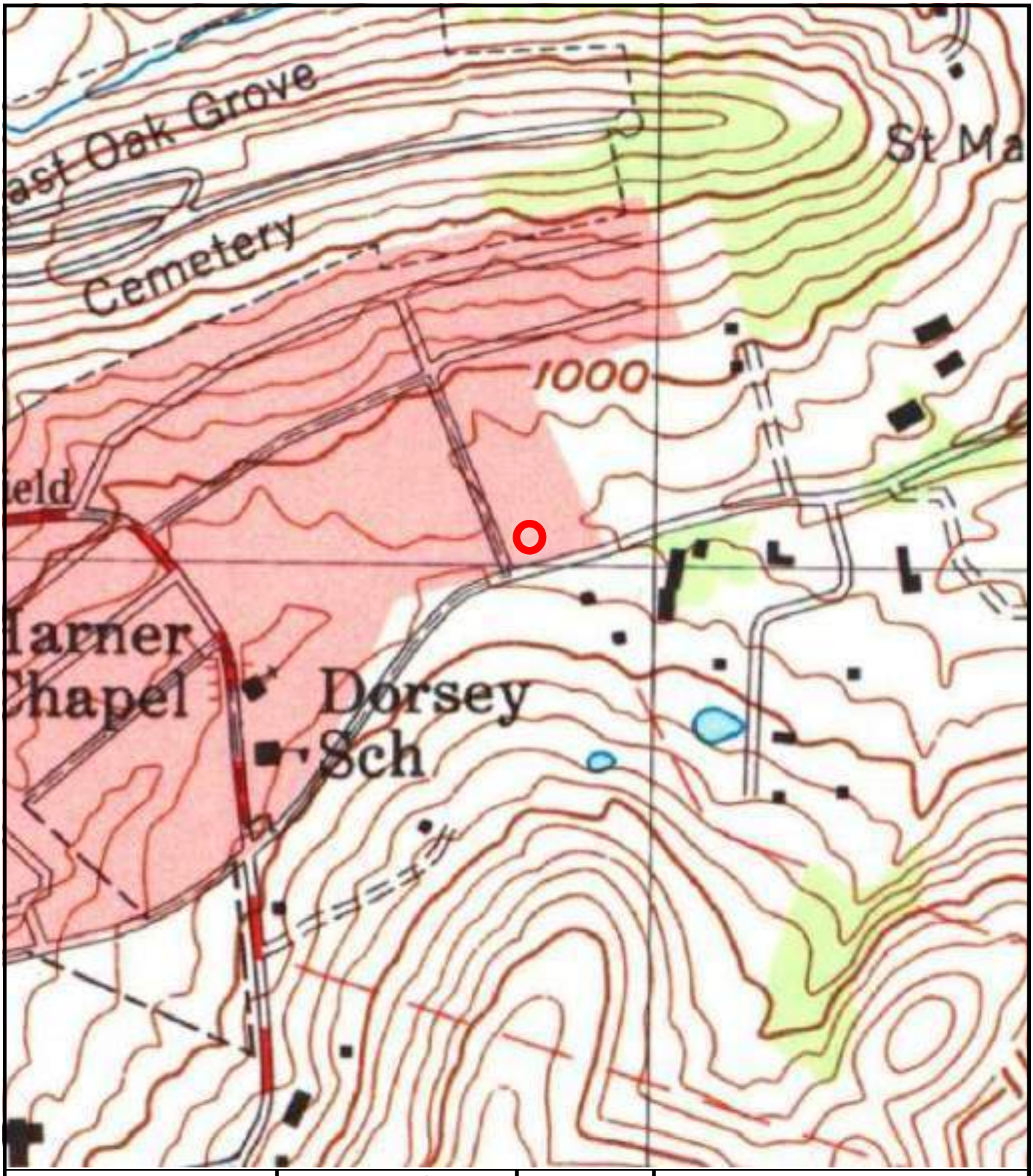
NAME House at 693 Greenbag Road **SITE#** MG-2658



Photograph 1. House with integral garage, facing northwest (Markosky 2018-12-04)



Photograph 2. Garage north of house, facing northwest (Markosky 2018-12-04)



Feet
0 500 1,000

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2658
House at 693 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2658
House at 693 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 703 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ House at 703 Greenbag Road	**Field Survey #**	**Site # *(SHPO Only)*** MG-2659
Town or Community Morgantown vicinity	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1900	**Style** American Four-Square	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt - Shingle	**Foundation** Not visible	
Property Use or Function **Residence** ○ **Commercial** ◉ **Other** ○	**UTM#** 17 S 590887 / 4385024	 Photograph 1. MG-2659 / House at 703 Greenbag Road, house and garage, facing northwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2659

Site No.

N

Present Owners	Owners Mailing Address
Clinton Water Association, Inc. Phone #	3282 Greenbag Road, Morgantown, WV 26505

Describe Setting

See continuation sheet.

.42 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2 **Stories** 3 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Additions ◉ **Yes** ○ **No** **If yes, describe**

See continuation sheet.

Describe All Outbuildings

See continuation sheet.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 703 Greenbag Road **SITE#** MG-2659

MG-2659 / House at 703 Greenbag Road is located on the north side of Greenbag Road approximately 180 feet east of Richard Avenue. The house is located in an area of mixed residential and commercial development approximately 1.54 miles southeast of the city of Morgantown.

The house at 703 Greenbag Road is a heavily altered two-story Four-Square dwelling from ca. 1900 that has been converted to offices for commercial use (Photograph 1). The house is clad in vinyl siding and capped by a steeply pitched hipped roof covered in asphalt shingle. The historic foundation material has been covered with applied brick. Fenestration consists of replacement one-over-one vinyl sash windows. A non-historic one-story addition clad in applied brick has been appended to the façade (southeast elevation) while a non-historic one-story addition covered in vinyl siding has been appended to the rear (northwest) elevation.

A ca. 1990 three-bay detached commercial-scale garage covered in standing seam metal is located immediately northwest of the house (Photograph 2).

No information was recovered linking the house at 703 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 703 Greenbag Road lacks integrity and has undergone extensive alterations and additions including front and rear additions, replacement siding and roof materials, and alterations to the original fenestration pattern and window openings. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

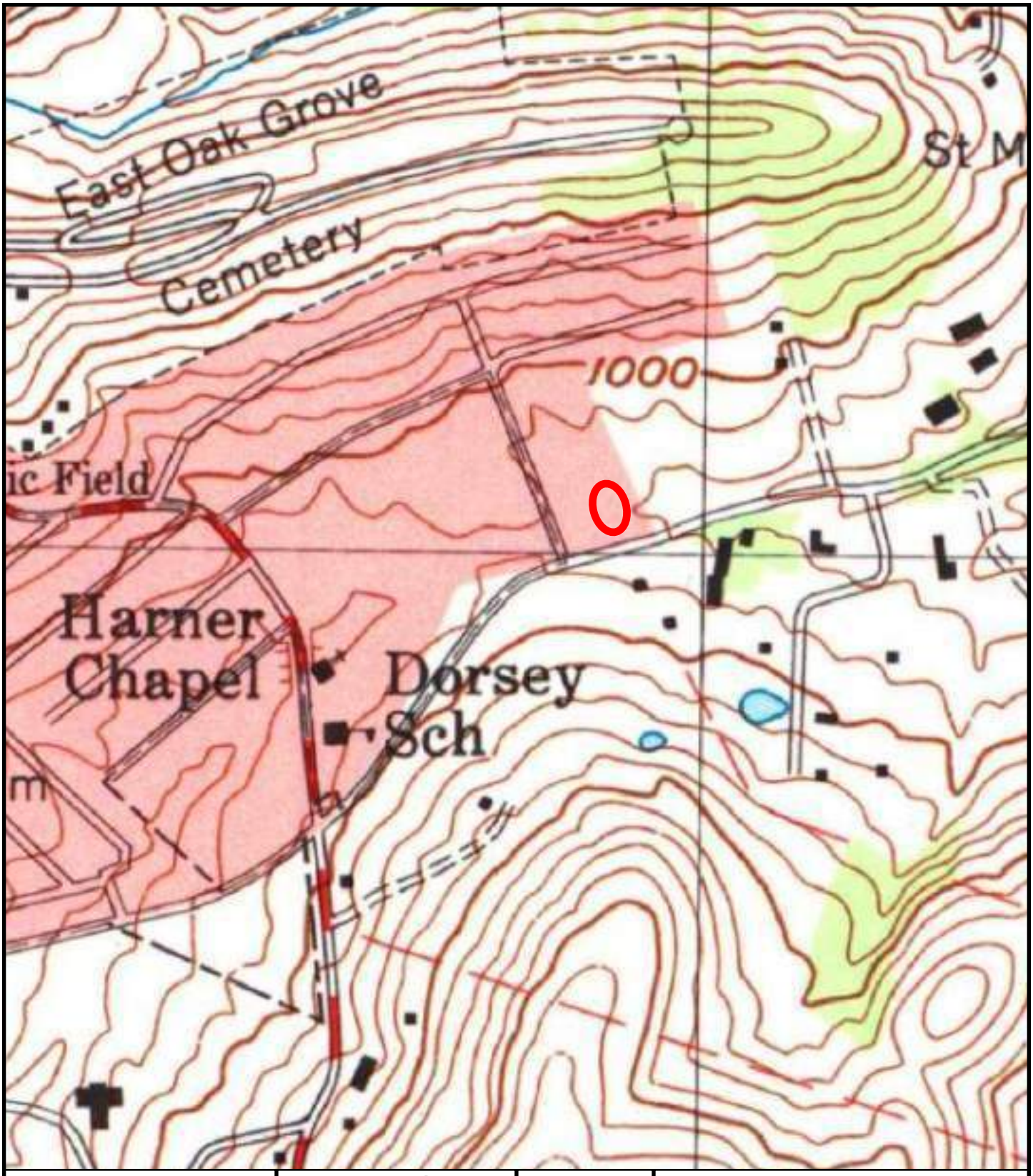
NAME House at 703 Greenbag Road **SITE#** MG-2659



Photograph 1. House with front and rear addition, facing northwest (Markosky 2018-12-04)



Photograph 2. Garage north of house, facing north (Markosky 2018-12-04)



Feet
0 500 1,000

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2659
House at 703 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2659
House at 703 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 710 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ House at 710 Greenbag Road	**Field Survey #**	**Site # *(SHPO Only)*** MG-2660
Town or Community Morgantown vicinity	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** C. 1930	**Style** American Four-Square	
Exterior Siding/Materials Synthetics - Vinyl	**Roofing Material** Asphalt - Shingles	**Foundation** Stone - Coursed Rubble	
Property Use or Function **Residence** ◉ **Commercial** ○ **Other** ○	**UTM#** 17 S 590937 / 4384972	 Photograph 1. MG-2660 / House at 710 Greenbag Road, facing southwest	
Survey Organization & Date The Markosky Engineering Group, December 4th, 2018	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2660

Site No.

N

Present Owners	Owners Mailing Address
Derrick and Annette Moore Phone #	710 Greenbag Road, Morgantown, WV 26505

Describe Setting

See continuation sheet.

.501 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 2.5 **Stories** 2 **Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations

◉ **Yes** ○ **No**

If yes, describe

See continuation sheet.

Additions

◉ **Yes** ○ **No**

If yes, describe

See continuation sheet.

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME House at 710 Greenbag Road **SITE#** MG-2660

MG-2660 / House at 710 Greenbag Road is located on the south side of Greenbag Road approximately 1.58 miles southeast of the city of Morgantown. The house is located adjacent to an open field while the area immediately to the north comprises a dense area of mixed residential and commercial development.

The house at 710 Greenbag Road is a ca. 1930 two-and-a-half-story American Four-Square dwelling resting on a coursed rubble stone foundation (Photographs 1 and 2). The house is clad in vinyl siding and is capped by a steeply pitched hipped roof covered in asphalt shingle. The roof is pierced by an interior chimney and includes hipped roof dormer windows on the façade (northwest) and rear (southeast) elevations. An altered hipped roof porch supported by simple Doric columns with a balustrade decorates to the façade. Three non-historic additions have been added to the rear of the house that quadruple the area of the building's footprint. A two-story non-historic living space addition, a patio partially covered by a shed roof, and a ca. 2000 one-story, three-bay garage have been appended to the rear of the house. Fenestration consists of replacement one-over-one vinyl sash windows with simulated eight-over-eight vinyl sash windows in the garage addition.

No information was recovered linking the house at 710 Greenbag Road to events significant on the local, state, or national level. Therefore, it is not eligible for listing in the NRHP under Criterion A. No information was recovered to suggest the house was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The house at 710 Greenbag Road lacks integrity because it has undergone alterations and additions including large rear additions, replacement siding and roof materials, alterations to original openings, and disruption of the original fenestration pattern. For these reasons it is not eligible for listing under Criterion C. The house has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

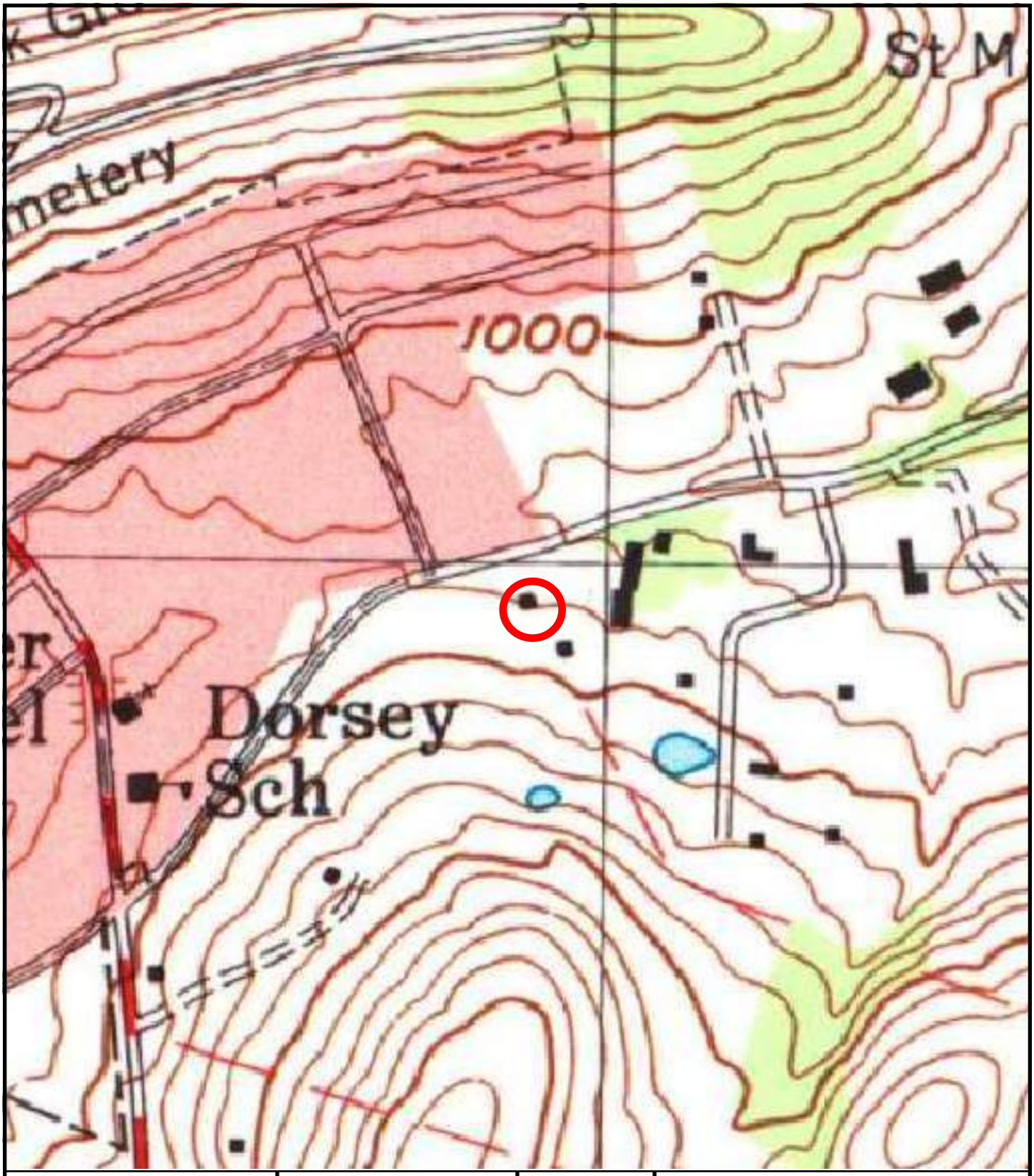
NAME House at 710 Greenbag Road **SITE#** MG-2660



Photograph 1. House showing rear addition and partial view of attached garage, facing south (Markosky 2018-12-04)



Photograph 2. House showing rear addition and attached garage, facing southeast (Markosky 2018-12-04)



Feet

0 375 750

Legend

Location of Historic Structure

N

W E

S

USGS Map
MG-2660
House at 710 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate
Parcel Boundary

N
W E
S

Site Map
MG-2660
House at 710 Greenbag Road

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address Greenbag Road over Cobun Creek	**Common/Historic Name/Both** ◉ ○ ○ Cobun Creek Culvert	**Field Survey #**	**Site # *(SHPO Only)*** MG-2661
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** Ca. 1965	**Style** 20th Century Box Culvert	
Exterior Siding/Materials Concrete	**Roofing Material** N/A	**Foundation** Concrete - Poured	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉ Transportation	**UTM#** 17 S 589688 E / 4384830 N	 Photograph 1. MG-2661 / Cobun Creek Culvert, from flood plain south of Greenbag Road, facing north	
Survey Organization & Date The Markosky Engineering Group, February 12, 2019	**Quadrangle Name** Morgantown South		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

MG-2661

Site No.

N

Present Owners	Owners Mailing Address
City of Morgantown Phone #	389 Spruce Street Morgantown, WV 26505

Describe Setting

See continuation sheet.

<1 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) _____**Stories** _____**Front Bays**

See continuation sheet.

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

None.

(Use Continuation Sheets)

Statement of Significance

See continuation sheet.

(Use Continuation Sheets)

Bibliographical References

See continuation sheet.

(Use Continuation Sheets)

Form Prepared By: Elizabeth Williams **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Cobun Creek Culvert **SITE#** MG-2661

MG-2661 / Cobun Creek Culvert carries Greenbag Road over Cobun Creek immediately to the northwest of Greenbag Road's intersection with Mississippi Street. The culvert is set within an area of commercial development and intermittent wooded areas approximately 1.45 miles south of the city of Morgantown.

The ca. 1965 culvert is a single span, reinforced concrete box culvert that carries Greenbag Road and fill over Cobun Creek (Photographs 1 and 2). The culvert is 71 feet in overall length with a span that measures 14 feet wide. The culvert includes tapered reinforced concrete wingwalls on its north and south elevations.

The small ca. 1965 Cobun Creek culvert was not included in the *West Virginia Statewide Historic Bridge Survey* because it was built at or near the 1965 cut off for the study and because its span length is shorter than the requisite 20 feet for evaluation (KCI et al. 2015).

No information was recovered linking the Cobun Creek culvert to events significant on the local, state, or national level. Therefore, it is not eligible for listing on the NRHP under Criterion A. No information was recovered to suggest the culvert was historically associated with individuals significant on the local, state, or national level. Therefore, it is not eligible for listing under Criterion B. The Cobun Creek culvert stands as a common and unexceptional example of a concrete box culvert. It does not possess the architectural merit or technological significance to be considered eligible for listing under Criterion C. The culvert has not been evaluated for significance under Criterion D for its potential to yield information important to the understanding of history or prehistory.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

KCI Technologies, Inc. and Mead & Hunt, Inc. (KCI et al.)
2015 *West Virginia Statewide Historic Bridge Survey: Final Survey Report, State Project # S699-HIS/BR-1.0000, Federal Project #BR-2004(029)E.* Prepared for West Virginia Department of Transportation, Division of Highways, April 2015.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

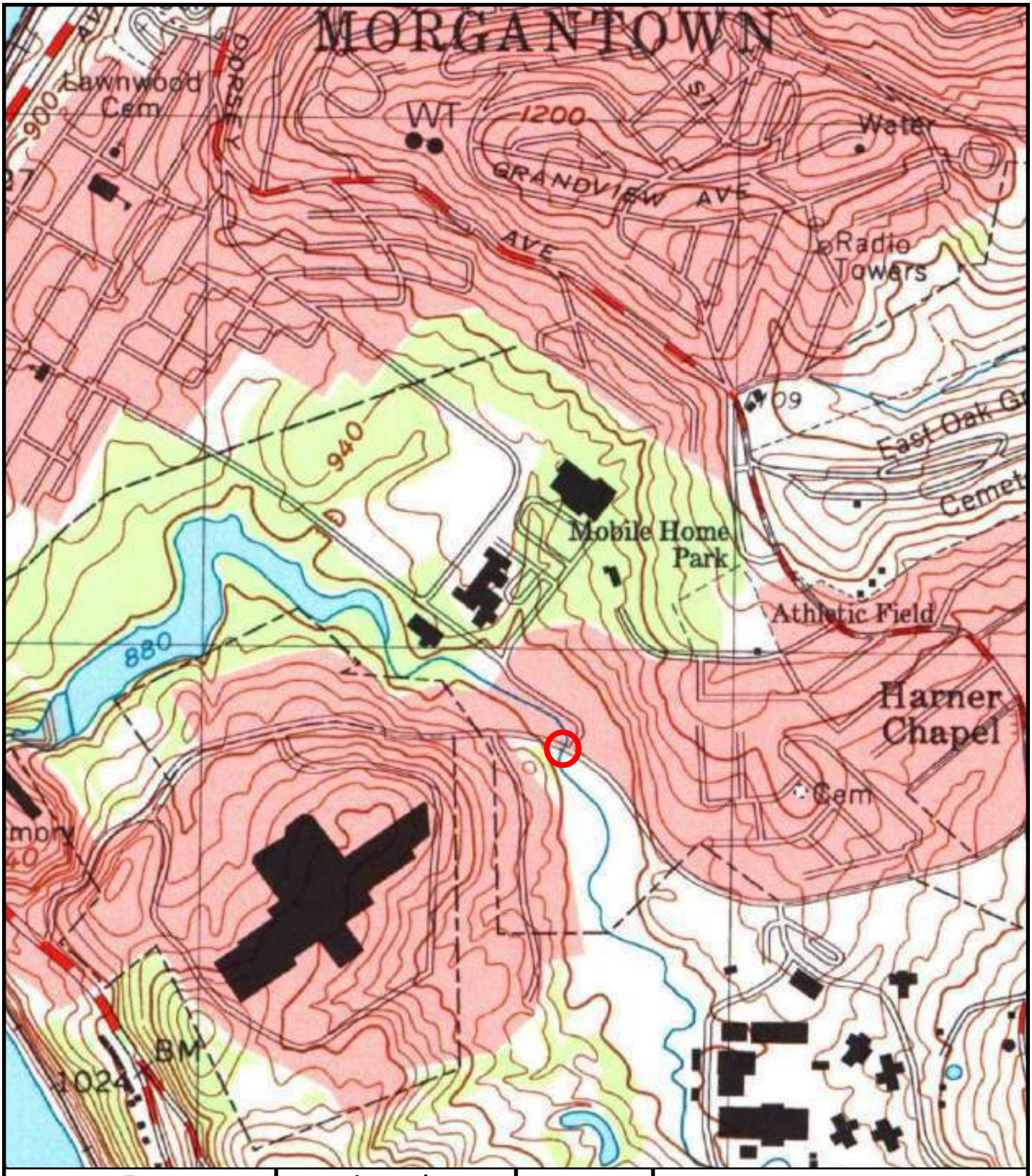
NAME Cobun Creek Culvert **SITE#** MG-2661



Photograph 1. From flood plain south of Greenbag Road, facing north (Markosky 2019-02-12)



Photograph 2. View from north of Greenbag Road, facing south (Markosky 2019-02-12)



Feet

0 500 1,500

Legend

Location of Historic Structure

N

W E

S

USGS Map
MG-2661
Cobun Creek Box Culvert

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Location of Culvert

N
W E
S

Site Map
MG-2661
Cobun Creek Box Culvert

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2018



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address 918 Greenbag Road	**Common/Historic Name/Both** ◉ ○ ○ The Sube Shop (auto repair)	**Field Survey #**	**Site # *(SHPO Only)*** MG-2665
Town or Community Morgantown	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder	**Date of Construction** c. 1970	**Style** Commercial	
Exterior Siding/Materials Metal - Steel; Brick (veneer)	**Roofing Material** Metal - standing seam; Asphalt - shingles	**Foundation** Concrete - Block	
Property Use or Function **Residence** ○ **Commercial** ◉ **Other** ○	**UTM#** 17 S 591658 E / 4385183 N	 Photograph 1. MG-2665 / The Sube Shop, north (front) and west elevations, facing southeast	
Survey Organization & Date The Markosky Engineering Group, October 31, 2019	**Quadrangle Name** Morgantown South, WV		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
MG-2665
599
2-5W

N

Present Owners	Owners Mailing Address
BAT Properties LLC Phone #	139 Lamplighter Drive Morgantown, WV 26508

Describe Setting

See continuation sheets

1.0 **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) 1 **Stories** 2 **Front Bays**

See continuation sheets

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings

No outbuildings

(Use Continuation Sheets)

Statement of Significance

See continuation sheets

(Use Continuation Sheets)

Bibliographical References

See continuation sheets

(Use Continuation Sheets)

Form Prepared By: Laura C. Ricketts **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group

Address: 232 Capitol Street

Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME The Sube Shop **SITE#** MG-2665

The commercial building housing a Subaru-specific auto repair shop is located to the southwest of the intersection of Greenbag Road and Lower Aarons Creek Road with a broad partially-paved parking lot located to the north and west. It occupies former farmland to the east of Aaron Creek in a semi-suburban area to the southeast of the Morgantown city limits.

The tall, one-story, rectangular plan service building is prefabricated with standing seam metal roof (very shallow front gable) and wall cladding. A one-story shed-roof office area clad with brick veneer is attached to the north (front) elevation. Five oversize vehicle bays line the west (side) elevation. Parking lots frame the building to the north and west.

The Sube Shop consists of an unremarkable and utilitarian prefabricated service building with a small office area. It does not appear to have significance as a commercial/service industry building; it is not associated with any people of demonstrated significance; and it is not distinguished for its architectural design. It is not eligible for NRHP listing under Criteria A, B, or C. It has not been evaluated under Criterion D.

Bibliographical References

Google Earth
2018 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed December 11, 2018.

United States Geological Survey (USGS)
1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

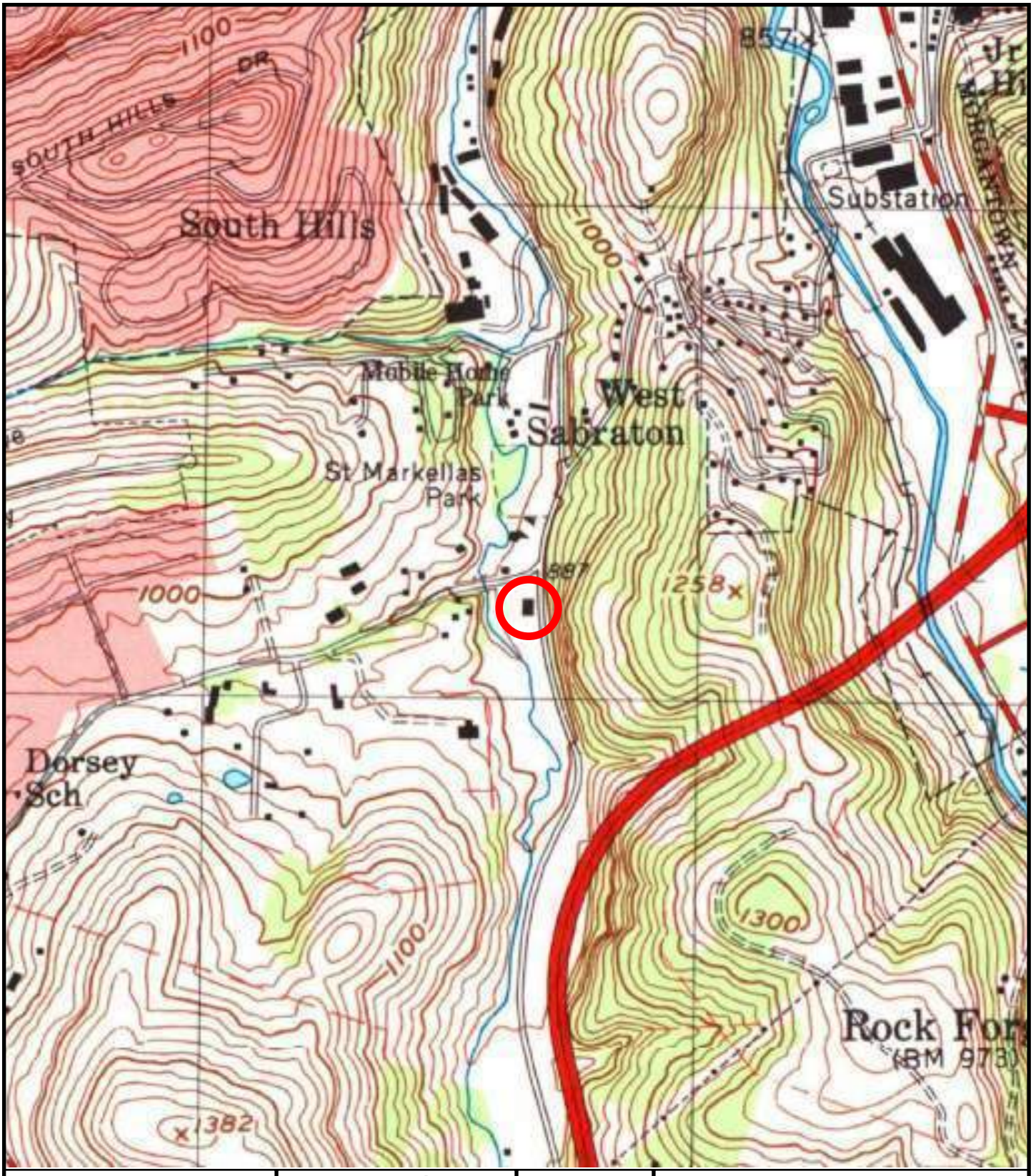
NAME The Sube Shop **SITE#** MG-2665



Photograph 1. North (front) and west elevations, facing southeast



Photograph 2. East and north (front) elevations, facing southwest



Feet
0 750 1,500

Legend
Location of Historic Structure

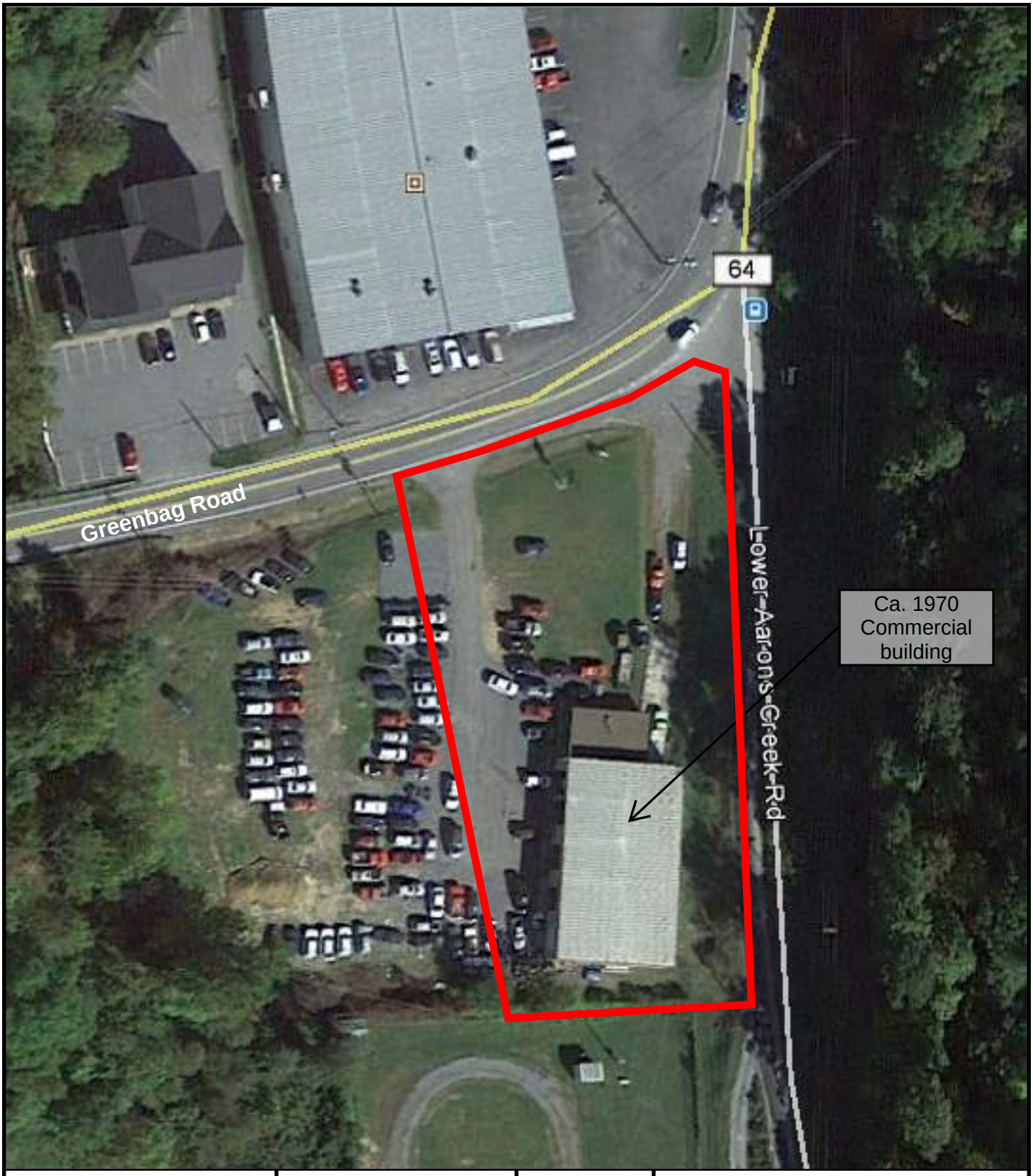
N
W E
S

USGS Map
MG-2665
The Sube Shop (auto repair)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2665
The Sube Shop (auto repair)

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2019



Internal Rating: _____

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address Greenbag Road over Aaron Creek	**Common/Historic Name/Both** ◉ ○ ○ Aaron Creek Box Culvert	**Field Survey #**	**Site # *(SHPO Only)*** MG-2666
Town or Community Morgantown vicinty	**County** Monongalia	**Negative No.**	**NR Listed Date**
Architect/Builder Greer Limestone Co. (contractor)	**Date of Construction** ca. 1966	**Style** Other - Continuous Concrete Culvert	
Exterior Siding/Materials Concrete	**Roofing Material**	**Foundation** Concrete	
Property Use or Function **Residence** ○ **Commercial** ○ **Other** ◉ Transportation	**UTM#** 17 S 591568 E / 4385233 N	 Photograph 1. MG-2666 / Aaron Creek Box Culvert through view, facing southwest (Google Earth 2019)	
Survey Organization & Date The Markosky Engineering Group, October 31, 2019	**Quadrangle Name** Morgantown South, WV		
	Part of What Survey/FR# Greenbag Road Improvement/NFA-2317(022)D		

Sketch Map of Property
Or Attach Copy of USGS Map

Site No.
MG-2666
999

N

Present Owners
West Virginia Division of Highways

Phone #

Owners Mailing Address

Describe Setting
The highway structure carries two lanes of busy Greenbag Road through a suburban area, which formerly was characterized by farmland and wooded areas but which has become increasingly developed in the late 20th and early 21st centuries

_____ **Acres**

☐ **Archaeological Artifacts Present**

Description of Building or Site (Original and Present) _____**Stories** _____**Front Bays**
See continuation sheets

(Use Continuation Sheets)

Alterations ○ **Yes** ◉ **No** **If yes, describe**

Additions ○ **Yes** ◉ **No** **If yes, describe**

Describe All Outbuildings
None

(Use Continuation Sheets)

Statement of Significance
See continuation sheets

(Use Continuation Sheets)

Bibliographical References
See continuation sheets

(Use Continuation Sheets)

Form Prepared By: Laura C. Ricketts **Date:** November 18, 2019

Name/Organization: The Markosky Engineering Group, Inc.
Address: 232 Capitol Street
Charleston, WV 25301

Phone #: 304-223-5205

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WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Aaron Creek Box Culvert **SITE#** MG-2666

The MG-2666 / Aaron Creek Box Culvert (Structure No. 31A203) is a two-span continuous concrete culvert constructed ca. 1966 that was built by the Greer Limestone Co. (WVDOH 1990). It is a cast in place structure consisting of two sidewalls, a center wall, a floor slab, and a roof slab, with two ten-foot span openings and a total length of 20.8 feet. A 2018 inspection of the culvert found that the structure was in fair condition (WVDOH 2018).

The culvert retains integrity despite regular repairs to the structure and the addition of safety guardrails ca. 1996 (WVDOH 1990).

The Aaron Creek Box Culvert was constructed when Greenbag Road was laid out in the mid-1960s. The Greer Limestone Company, who was responsible for its construction, was founded in 1914 and is still active today as part of Greer Industries, Inc (Greer Industries, Inc. 2006). In the late 1960s, when the construction of this culvert was included among its minor endeavors, Greer Limestone Company advertised itself as a local construction company with a location ten miles southeast of Morgantown in Greer, West Virginia (The Dominion News 1968).

When the *West Virginia Statewide Historic Bridge Survey* was completed in 2015, the Aaron Creek Box Culvert was not among the structures that were evaluated, which could have been due to its late build date or small size (KCI Technologies, Inc. et al. 2015).

The Aaron Creek Box Culvert is not eligible for listing on the National Register of Historic Places (NRHP). It is an unremarkable example of a common structure type that does not demonstrate technological or historical significance. It is not significant under NRHP Criteria A, B, or C. It has not been evaluated under Criterion D for its potential to provide information important to our understanding of history or prehistory.

Bibliographical References

Google Earth
2019 Aerial images of Monongalia County, West Virginia. Website at https://earth.google.com/web/. Accessed October 24, 2019.

Greer Industries, Inc.
2006 "Greer History." Website at http://greerindustries.com/index.html. Accessed October 30, 2019.

KCI Technologies, Inc. and Mead and Hunt, Inc.
2015 *West Virginia Statewide Historic Bridge Survey: Final Survey Report, State Project # S699-HIS/BR-1.0000, Federal Project #BR-2004(029)E*. Prepared for the West Virginia Department of Transportation, Division of Highways, April 2015.

The Dominion News
1968 "Greer Limestone Co.," *The Dominion News*. June 16, 1968, page 4.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME **Aaron Creek Box Culvert** **SITE#** **MG-2666**

United States Geological Survey (USGS)

1997 Morgantown South, West Virginia topographic map, 7.5 minute quadrangle. United States Geological Survey, Washington, D.C.

West Virginia Division of Highways (WVDOH)

1990 *Bridge Inspection Report: Bridge 31A203 Aaron Creek Box Culvert*. On file at the West Virginia Division of Highways, Charleston, West Virginia.

2018 *Bridge Inspection Report: 31A203 Monongalia CR 857 over Aaron Creek*. On file at the West Virginia Division of Highways, Charleston, West Virginia.

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Aaron Creek Box Culvert **SITE#** MG-2666



Photograph 1. Through view of culvert, facing southwest (Google Earth 2019)



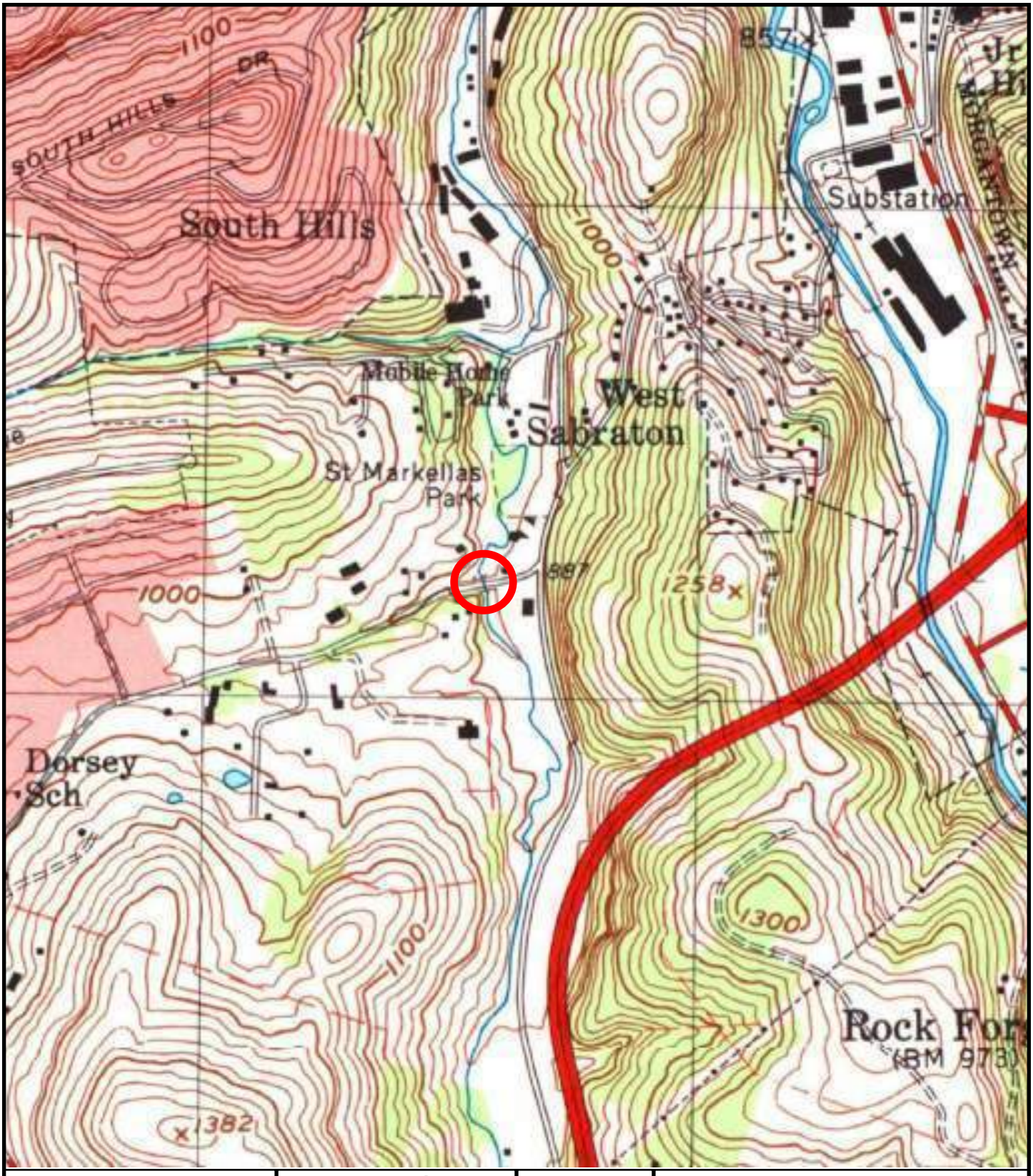
Photograph 2. Through view of culvert, facing northeast (Google Earth 2019)

WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM
CONTINUATION SHEET

NAME Aaron Creek Box Culvert **SITE#** MG-2666



Photograph 3. South elevation of culvert, facing northeast (WVDOH 2018)



Feet
0 750 1,500

Legend
Location of Historic Structure

N
W E
S

USGS Map
MG-2666
Aaron Creek Box Culvert

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: USGS 1997



*Not to scale

Legend

Approximate Parcel Boundary

N
W E
S

Site Map
MG-2666
Aaron Creek Box Culvert

MARKOSKY

Greenbag Road Improvement Project

Morgan District and
City of Morgantown
Monongalia County
Source: Google Earth 2019

Greenbag Road Improvement Project

Appendix F

Phase I Archaeology Report

FR #: _____

REDACTED

GREENBAG ROAD IMPROVEMENT PROJECT
MONONGALIA COUNTY, WEST VIRGINIA

State Project # U331-857-0.67 00
Federal Project # STP-0857(019)D

PHASE I ARCHAEOLOGICAL SURVEY REPORT

ABBREVIATED TECHNICAL REPORT

Prepared for:

West Virginia Department of Transportation
Division of Highways

Prepared by:

Jessica L.S. Schumer, M.A., R.P.A.
Principal Investigator



And

Elizabeth Williams
Architectural Historian

October 31, 2019

ABSTRACT

The West Virginia Department of Transportation, Division of Highways (WVDOH) has proposed improvements to Greenbag Road in Monongalia County, West Virginia. The Markosky Engineering Group, Inc. (Markosky) conducted a Phase I archaeological survey for the project in order to ensure compliance with federal and state cultural resource regulations, including Section 106 of the National Historic Preservation Act (NHPA), as amended; the Advisory Council on Historic Preservation guidelines (36CFR§800); the National Environmental Policy Act of 1969; The Archaeological and Historic Preservation Act of 1974; and West Virginia State Code 29-1-8, and its implementing regulations, Title 82, Series 2: "Standards and Procedures for Administering State Historic Preservation Programs". The survey was conducted in accordance with the West Virginia State Historic Preservation Office's (WV SHPO) *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation* (Trader 2018). The project is within the Appalachian Plateau physiographic province. It is in the Monongahela River subbasin; it crosses Cobun Creek and abuts Aaron Creek. The project is mapped on the United States Geological Survey (USGS) Morgantown South, West Virginia 7.5 minute topographic quadrangle.

Because project design and frequent revisions to design was in progress during the Phase I archaeology fieldwork, an archaeological Area of Potential Effects (APE) was not yet able to be established for the project; therefore, a study area was delineated, that attempted to capture all permanent impacts and temporary work spaces needed during construction. The study area totals 19.96 ha (49.33 ac), of which 13.23 ha (32.70 ac) are previously disturbed, 2.40 ha (5.93 ac) are steep, 0.71 ha (1.76 ac) are saturated or are in stream beds, and 3.62 ha (8.94 ac) contained intact soils. Prior to the completion of this report, a preliminary APE for the project was established based on Preliminary Field Review Design from 3/29/2019. This report shows the results of the Phase I survey within the larger study area, as well as the preliminary APE.

The Phase I archaeological survey consisted of background research, field investigations, and the preparation of this report. There are no previously identified pre-contact or historic period cultural resources mapped within or immediately adjacent to the study area.

Phase I fieldwork was conducted between January 28 and March 21, 2019 and on October 8, 2019. In total, two hundred thirteen (213) shovel test pits and one (1) test unit was excavated within the study area. The Phase I survey did not identify any pre-contact or historic period archaeological resources within the study area or APE. The project as currently designed will not impact any archaeological resources eligible for or listed on the National Register of Historic Places (NRHP) and no further archaeological investigations are recommended.

FR# _____

GREENBAG ROAD IMPROVEMENTS
MONONGALIA COUNTY, WEST VIRGINIA

State Project #: U331-857-0.67 00

Federal Project #: STP-0857(019)D

PHASE I ARCHAEOLOGICAL SURVEY

ABBREVIATED TECHNICAL REPORT

Prepared by:

Jessica L.S. Schumer, M.A., R.P.A.
Principal Investigator



Submitted by:

The Markosky Engineering Group, Inc.
232 Capitol Street
Charleston, WV 25301
(304) 223-5205

Prepared For:

West Virginia Department of Transportation
Division of Highways

1340 Smith Street
Charleston, West Virginia 25301

October 31, 2019

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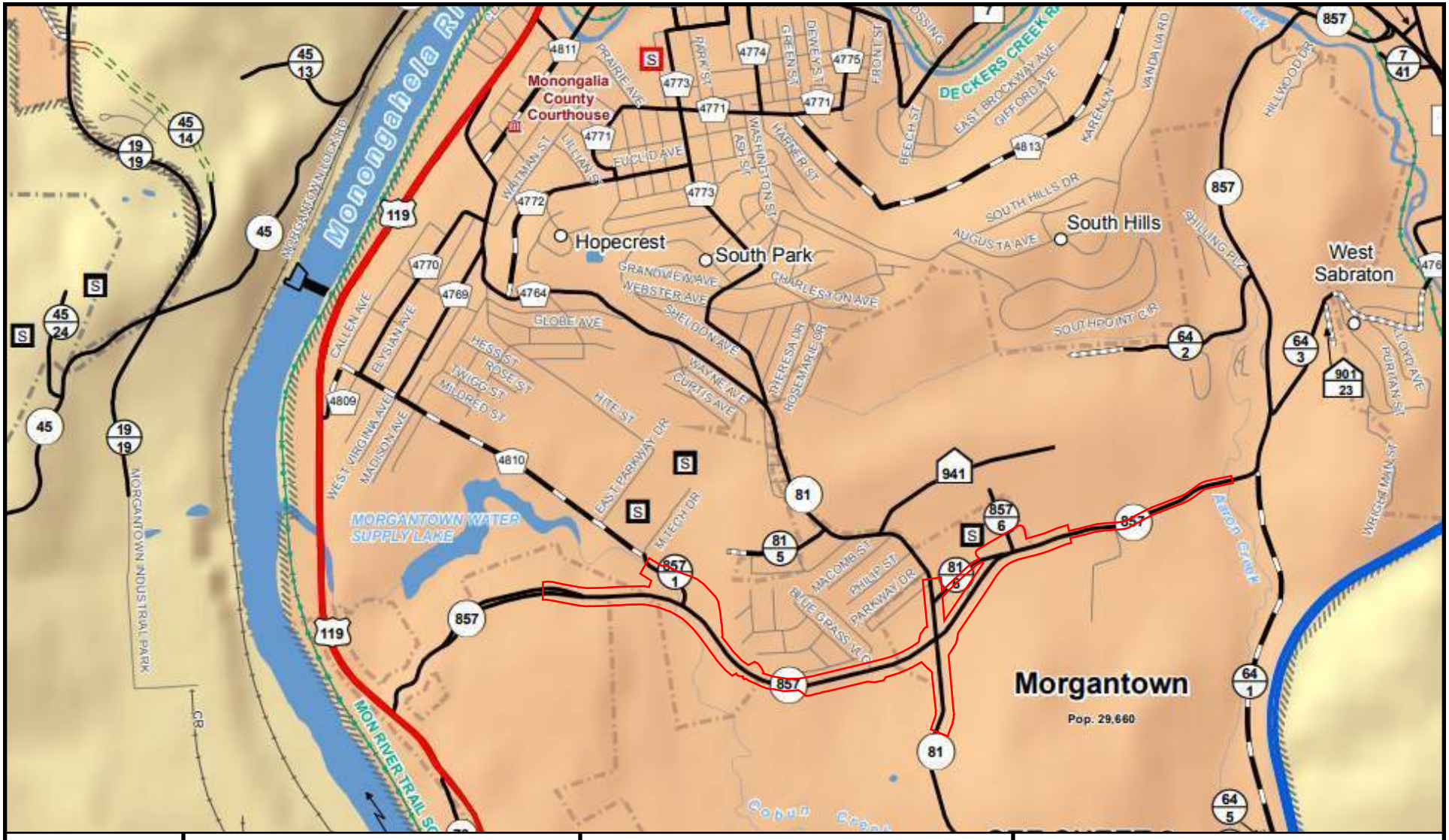
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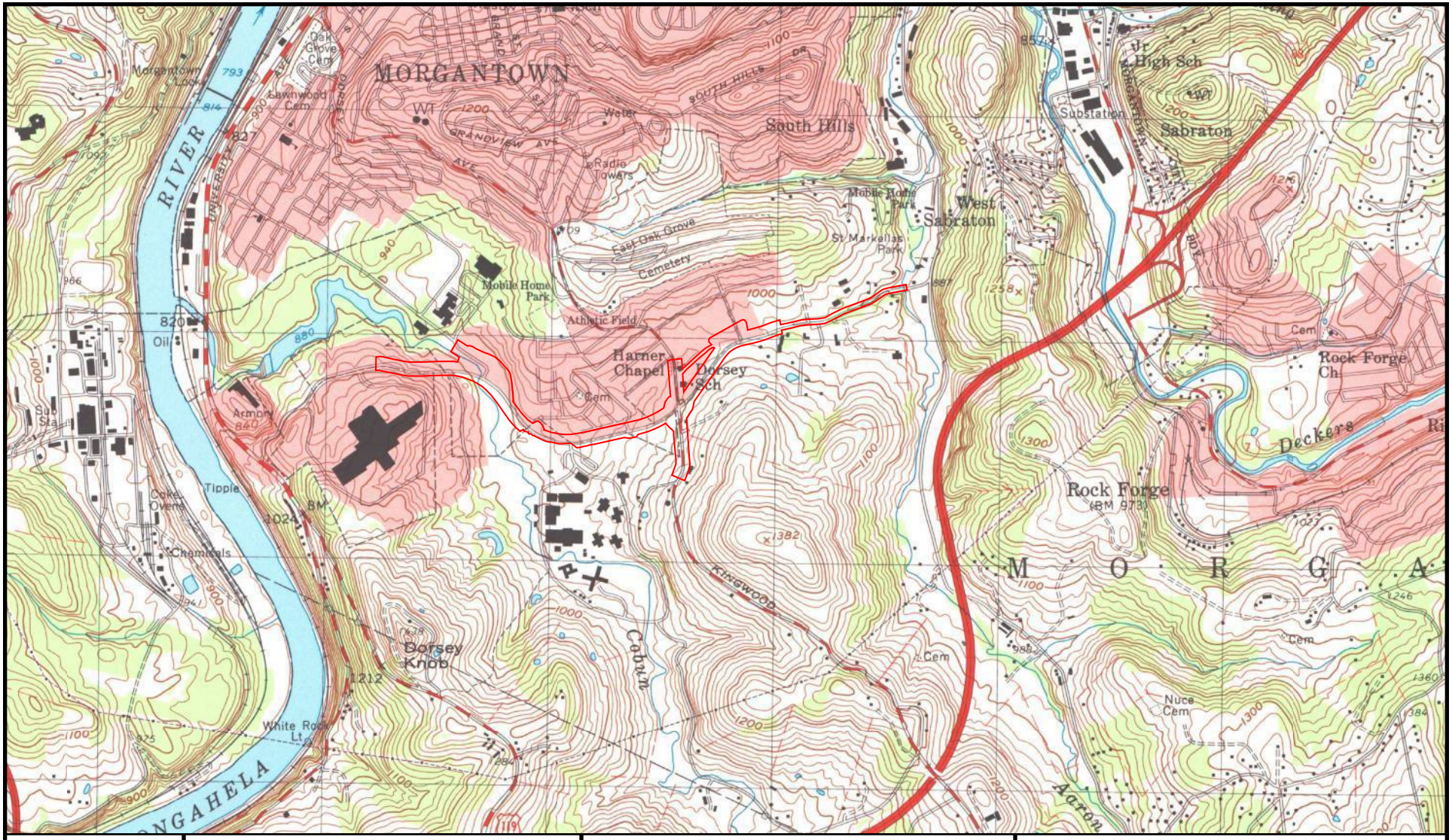
1.1 Project Purpose

The Markosky Engineering Group, Inc. (Markosky) conducted a Phase I archaeological survey for the Greenbag Road Improvement Project (hereinafter, referred to as the Project) located southeast of the city of Morgantown in Monongalia County, West Virginia (**Figures 1 and 2**). The Phase I archaeological survey was designed and conducted to facilitate project compliance with state and federal legislation regarding cultural resources, including Section 106 of the National Historic Preservation Act (NHPA), as amended; the Advisory Council on Historic Preservation guidelines (36CFR§800); the National Environmental Policy Act of 1969; The Archaeological and Historic Preservation Act of 1974; and West Virginia State Code 29-1-8, and its implementing regulations, Title 82, Series 2: "Standards and Procedures for Administering State Historic Preservation Programs". The survey was conducted in accordance with the West Virginia State Historic Preservation Office's (WV SHPO) *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation* (Trader 2018).

1.2 Project Description

The Project begins 0.64 km (0.40 mi) east of the intersection of Greenbag Road (CR 857) and US 119 and ends where Greenbag Road crosses Aaron Creek. The overall roadway improvements include wider lanes and shoulders along with a dedicated center turn lane prior to the Mississippi Street (CR 857/1) intersection. A curb and gutter will be installed along the west side of Greenbag Road to help address drainage issues and to provide a sidewalk along the entire route to the Dorsey Avenue/Kingwood Pike (CR 81) intersection. In addition, the west side shoulder will be utilized as a bike lane for the corridor between the commercial district and the residential areas. The roadway will be improved to incorporate two 11-foot travel lanes, a 12-foot center turn lane, and curb and gutter on each side up to Mississippi Street. Between Mississippi Street and Dorsey Avenue/Kingwood Pike, the roadway will be improved to two 12-foot travel lanes and a 4-foot paved shoulder on the east side. A 3-foot paved shoulder with a 2-foot curb and gutter will be on the west side. A 5-foot concrete sidewalk will be located on the west side of Greenbag Road and connect with the sidewalk at Mountainview Elementary School. Both the Mississippi Street and Dorsey Ave/Kingwood Pike intersections with Greenbag Road are proposed to be reconstructed as single-lane roundabouts to provide for continuous traffic flow along the route and to increase the safety of the traveling public as they enter each intersection. The roundabouts will also be developed to allow the safe movement of pedestrians along the sidewalk on the west side of Greenbag Road and will include lighting on each approach to the roundabout. Additional work on Luckey Lane will improve the width of the travel lanes within the existing right-of-way and re-pave the length of the roadway between Greenbag Road and Dorsey Avenue. From the intersection of Greenbag Road and Jonathan Lane to the crossing of Aaron Creek the project will include roadside drainage improvements as needed to address stormwater run-off.


Monongalia County Courthouse
Hopecrest
South Park
South Hills
West Sabraton
Morgantown
Pop. 29,660
MORGANTOWN WATER SUPPLY LAKE
MORGANTOWN INDUSTRIAL PARK
MON RIVER TRAIL SO
DECKERS CREEK
Aaron Creek
Coburn Creek
Monongahela R
PRAIRIE AVE
PARK ST
GREEN ST
DEWEY ST
FRONT ST
EUCLID AVE
WALTMAN ST
LILLIAN LN
WASHINGTON ST
ASH ST
HARNER ST
BEECH ST
KARELIA
VANDA LN RD
EAST BROCKWAY AVE
GIFFORD AVE
HILLWOOD DR
SOUTH HILLS DR
AUGUSTA AVE
PHILLIPS PKY
GRANDVIEW AVE
WEBSTER AVE
SHELDON AVE
CHARLESTON AVE
SOUTHPOINT CIR
LLOYD AVE
PURITAN ST
WRIGHT AVE
GLOBE AVE
HESS ST
ROSE ST
TWIGG ST
MILDRED ST
HITE ST
CALLEN AVE
ELYSIAN AVE
WEST VIRGINIA AVE
MADISON AVE
WAYNE AVE
CURTIS AVE
TERESA DR
ROSEMARIE DR
EAST PARKWAY DR
M TECH DR
MACOMB ST
PHILIP ST
PARKWAY DR
BLUE GRASS LN
MORGANTOWN INDUSTRIAL PARK
CR
4811
4773
4774
4775
4771
4772
4770
4769
4764
4809
4810
4813
45
13
45
14
19
19
119
24
857
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901
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64
5
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E
S
Feet
0
4000
8000
Meters
0
1200
2400
MARKOSKY
Archaeological Study Area
Figure 1
Project Location on a General Highway Map
Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report
Monongalia County
Source: WV DOT 2018



N
W E
S

Feet
0 2000 4000

Meters
0 600 1200

Archaeological Study Area

Figure 2
Project Location on a Topographic Map

MARKOSKY

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
Source: 7.5' USGS Topographic Quadrangle Morgantown South, WV 1997a

The work will require takes for right-of-way, temporary construction easements, and permanent drainage easements along the route. Traffic will be maintained during construction through the use of a maintenance of traffic (MOT) plan to minimize delays, maintain access to businesses and residences, and maintain safety for travelers and construction workers. The proposed MOT plan will include either the use of a detour on existing roads, temporary signals, or flaggers. Construction will be completed in multiple stages to allow for continued access through the intersection at Greenbag Road and Dorsey Ave/Kingwood Pike.

The project has state (State Project # U331-857-0.67 00) and federal (Federal Project # STP-0857(019)D) funding.

1.3 Study Area Description

Because design for the project was in progress at the time of the Phase I survey, a study area was created for the survey boundary. The study area is based on the limits of construction as of March 22nd, 2019 from the western extent of the project near Mountaineer Mall to Jonathan Lane, which was initially the eastern extent of the project. From the western extent to Jonathan Lane, the study area generally includes a 7.6 m (25.0 ft) buffer of the limits of construction, with a 15.2 m (50.0 ft) buffer at the Dorsey Avenue roundabout, and with no buffer in front of the Federal Correctional Institution, Morgantown Kennedy Center. Due to the continuous design changes and in coordination with the DOH, the study area boundary is meant to be larger than the final design in an attempt to capture all potential permanent and temporary impacts that would be part of an archaeological APE. Prior to the completion of this report, preliminary field review design became available and was submitted to the WV DOH on 3/29/2019. As per 36CFR§800.16(d), the APE is defined as, “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties…”. The APE that was created based on the 3/29/2019 preliminary field review design includes all areas of right-of-way, temporary construction easements, and permanent drainage easements. The intention of this report is to both provide the results of the full Phase I survey within the broader study area, as well as to provide the results of the survey within the APE based on the 3/29/2019 design. The body of this report will focus on the results of the survey within the broader study area; however, pertinent sections discuss the results specific to the 3/29/2019 APE. Prior to the completion of this report, the eastern extent of the project was extended to Aaron Creek on July 31, 2019. The study area was extended to include this area. From Jonathan Lane to Aaron Creek, the study area is defined by a 40-foot buffer from the existing centerline of Greenbag Road.

The project study area is located on the south side of the city of Morgantown, approximately 2.67 km (1.66 mi) from the city center. The eastern extent of the study area is 2.99 km (1.86 mi) west of the Census Designated Place (CDP) of Brookhaven. The western extent of the study area is 2.55 km (1.58 mi) east of the unincorporated community of Harmony Grove. It is mapped on the 7.5 minute United States Geological Survey (USGS) Morgantown South (USGS 1997a) West Virginia topographic quadrangle (see **Figure 2**).

The study area encompasses a total area of 19.96 ha (49.33 ac). Areas of excessively steep slopes, soils that show modern disturbance, and certain wet areas such as stream beds and small drainages have low or no potential for in situ archaeological deposits and therefore are not testable.

1.4 Current Investigations

Phase I archaeological survey fieldwork was conducted by Markosky between January 28 and March 21, 2019 and on October 8, 2019. The Phase I efforts were designed and conducted to determine if any potentially significant (i.e., eligible for listing on the National Register of Historic Places [NRHP]) archaeological resources are present within the established study area. Jessica L.S. Schumer, M.A., R.P.A. served as Principal Investigator. Ryan Rowles acted as QA/QC manager, assisted with cultural resources considerations of design changes, and provided technical guidance on the project. Scott Gajewski served as Field Director. Justin McKeel served as Field Director for additional survey efforts following design changes. Mr. McKeel also oversaw GIS work for the project. Sarah Baughman also conducted GIS work and created report figures. All project personnel meet or exceed the professional qualifications as specified for their positions in 36CFR§61. Resumes of key personnel are included in **Appendix A**.

At the time of the survey, the study area was characterized by areas of residential and commercial development, particularly on the north side of the study area and in the western half of the Project. Some undeveloped areas with small stands of trees and grassy fields are present in the eastern half of the study area, south of Greenbag Road. The survey identified that the majority of the study area was previously disturbed, sloped in excess of twenty percent, or within saturated areas or streams. **Table 1** summarizes the previously disturbed, sloped, wet, and intact portions of the study area. **Table 2** summarizes these areas within the APE (based on Preliminary Field Review Design as of 3/29/2019).

Table 1. Disturbed, Sloped, Wet, and Intact Portions of the Study Area

Soil /Surface Condition	Hectares	Acres	%
Previously Disturbed	13.23	32.70	66
Steep	2.40	5.93	12
Wet/Streambed/Drainage	0.71	1.76	4
Intact/Test Areas	3.62	8.94	18
Total	**19.96**	**49.33**	**100**

Table 2. Disturbed, Sloped, Wet, and Intact Portions of the APE*

Soil /Surface Condition	Hectares	Acres	%
Previously Disturbed	7.76	19.17	69
Steep	1.57	3.88	14
Wet/Streambed/Drainage	0.27	0.68	2
Intact/Test Areas	1.44	3.56	13
Not included as part of design as of 10/31/2019	0.16	0.40	2
Total	**11.20**	**27.69**	**100**

**Based on Preliminary Field Review Design (3/29/2019)*

Sloped areas were walked over to confirm that no archaeological resources were present at the modern ground surface, but because these areas have low potential for buried archaeological resources, no subsurface survey methods were employed on steep slopes. Wetland areas with gleyed or saturated soils were generally tested, since these areas may contain archaeological deposits despite being saturated at the time of the survey. Natural wetland areas may have been important resource areas during drier seasons in the pre-contact era, and some areas have more recently become wetlands, which might have been habitable in earlier times. Numerous split spoon auger borings and 4-in bucket auger probes were completed to verify the locations and delineations of previous disturbances. Areas that appeared to be undisturbed and relatively level (less than 20 percent slope) were surveyed via the excavation of two hundred thirteen (213) STPs and one (1) TU. No pre-contact or historic period archaeological resources of any kind were identified during the Phase I survey.

2.0 Environmental Background

2.1 Physiography

The study area is located in the Appalachian Plateau physiographic province (West Virginia Geological and Economic Survey [WVGES] 2017). The Appalachian Plateau province covers most of the western part of West Virginia on its southwestern orientation which extends from New York State to central Alabama. Within Monongalia County, the Appalachian Plateau is characterized by steep hillslopes and narrow valleys, with relatively flat, low floodplains and terraces along the Monongahela River (Wright *et al.* 1982:1). Elevations within the county range between 770.0 m (2,526.0 ft) and 241.7 m (793.0 ft), with the highest point near Sand Springs and the lowest on the Monongahela River in the northern part of the county (Wright et al. 1982:1).

The Appalachian Plateau province consists mostly of relatively flat rock formations, except on the eastern side where a sequence of folds and faults are present. The eastern portion contains the oldest rock formations dating from the late Ordovician through the Mississippian. The rest of the plateau consists of Pennsylvanian and Permian aged bedrock and is known for its mineable deposits of coal (WVGES 2017).

2.2 Bedrock Geology and Lithic Raw Materials

The study area lies in the greater Monongahela River valley in central Monongalia County. The underlying bedrock of Monongalia County is predominantly Pennsylvanian and Transitional Pennsylvanian/Permian, consisting almost exclusively of sedimentary rock. During the Carboniferous period, Late Mississippian sea regression resulted in low-lying, swampy terrain that persisted through the Pennsylvanian sub-period in West Virginia. This Pennsylvanian sub-period produced thick sedimentary deposits of non-marine sandstone, shale, and coal (McDowell and Blake 2011). The Pennsylvanian Conemaugh group is mapped at the extreme eastern end of the study area, consisting of cyclic sequences of mostly non-marine shale, siltstone, and sandstone, with thin limestone and coal deposits (WVGES 2011).

The majority of the study area is mapped as being underlain by the Quaternary Alluvium geologic unit (WVGES 2011). Millions of years after the Carboniferous period, the Pleistocene-age proglacial Lake Monongahela formed in the ancestral Monongahela River valley, potentially between 780 and 1,700 Ka BP (Marine and Donahue 2000:36). The fluctuating height of Lake Monongahela through time left behind alluvial and lacustrine deposits that have been mapped at nearly 30 m (100 ft) thick (Marine and Donahue 2000:32). The Quaternary Alluvium geologic unit consists of deposits of sand, gravel, silt, and highly clastic clay that, in the vicinity of the study area, were deposited as Lake Monongahela and extended up Cobun Creek and its tributaries.

In the vicinity of Morgantown, a variety of lithic raw materials would have been available for use as toolstone in lithic stone tool production, including Brush Creek Chert, Uniontown chert, and Ten Mile chert. Other non-local raw materials have been documented at archaeological sites in

the Monongahela River drainage, including Kanawha chert, Brush Creek Hughes River chert, Shriver (Helderberg) chert, Huntersville chert, Upper Mercer chert, and Vanport (or "Flint Ridge") chert, among others. These cherts occur variably as nodules, discontinuous lenses, and beds within marine and non-marine limestones in Pennsylvania, West Virginia, and Ohio.

Brush Creek chert originates from the Brush Creek limestone in the Conemaugh Group as part of the Casselman Formation (Vento and Donahue 1982:118; Holland 2003). The Pennsylvanian Conemaugh Group is the primary bedrock unit mapped in the Monongahela River drainage, from northern West Virginia into southwestern Pennsylvania and parts of southeastern Ohio. Given the widespread distribution of this chert, it is also quite variable. Brush Creek can be highly fossiliferous, though there are highly vitreous and glossy varieties of Brush Creek that do not contain fossils (Vento and Donahue 1982:118). In general, Brush Creek ranges from olive brown to light green, with light gray also common (Vento and Donahue 1982:118; Holland 2003:136). Brush Creek Chert should not be confused with the Brush Creek Hughes River Variety, a buff and porous variety, that is often light olive gray to honey colored (Boldurian 1985; Herbstritt 1981).

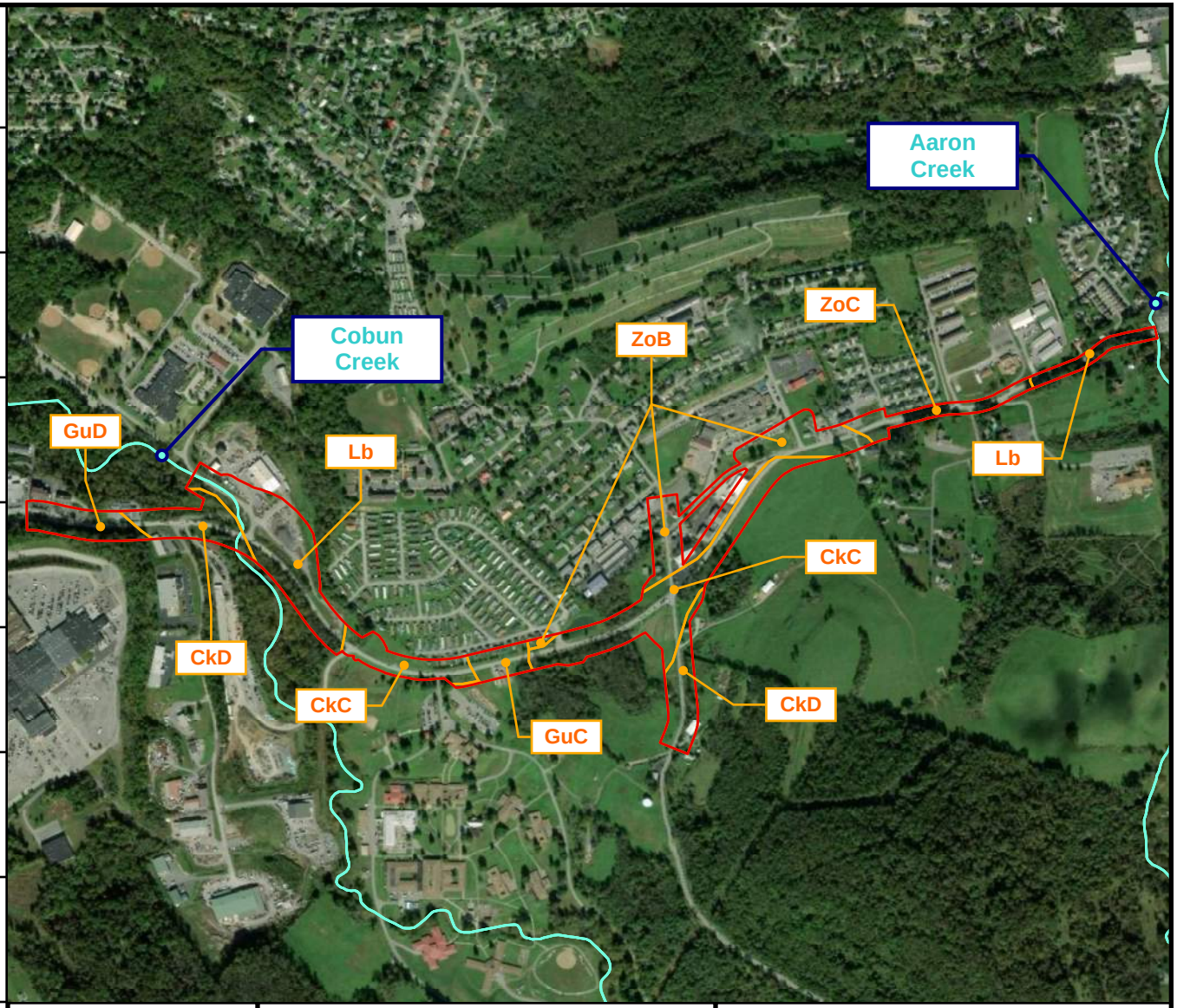
Uniontown chert occurs in marine limestones in the Uniontown Formation of the Monongahela Group. Uniontown is a tuberous nodular chert. Colors range from light/medium gray to dark yellowish brown, with yellow-streaked, dark red, and pale orange varieties (Eisert 1974, Holland 2003:136). When weathered, Uniontown is a yellowish-brown to gray. Fossils are abundant and a hallmark characteristic of Uniontown chert are the non-marine ostracods arranged *en echelon* (Vento and Donahue 1982:119). If not locally available in the nearby outcrops of the Monongahela Group, known sources have been documented in nearby Greene and Fayette Counties, Pennsylvania.

Ten Mile chert outcrops between the lowest member of the Permian Greene Formation and the upper member of the Washington Formation, both of the Dunkard Group, in northwestern West Virginia and southwestern Pennsylvania (Vento and Donahue 1982:118; Holland 2003). Ten Mile occurs as thin, discontinuous lenses and beds with a very restricted surface distribution. The color of this chert ranges from dark grayish brown to grayish blue, with a distinctive pale greenish-gray to grayish-white patina developing when weathered (Vento and Donahue 1982:118; Herbstritt 1981). Ten Mile Chert does not contain silicified fossils and it exhibits few inclusions, checks, vugs (crystal pockets), or incipient fractures (Vento and Donahue 1982:118).

2.3 Soils Mapped in the Study Area

Four principal soil units are mapped in the testable portions of the Greenbag Road study area with various slope ranges: Lobdell silt loam, Gilpin-Culleoka-Upshur silt loams, Clarksburg silt loam, and Zoar silt loam (**Figure 3**) (USDA, NRCS 2019). A general discussion of these soil units is included in this section. The soils mapped within each Test Area for the Phase I archaeological survey, are included in the Phase I Archaeological Results Section, below.

Symbol	Description
CkC	Clarksburg Silt Loam 8-15% Slopes
CkD	Clarksburg Silt Loam 15-25% Slopes
GuC	Gilpin-Culleoka-Upshur Silt Loams, 8-15% Slopes
GuD	Gilpin-Culleoka-Upshur Silt Loams, 15-25% Slopes
Lb	Lobdell Silt Loam 0-3% Slopes Occasionally Flooded
ZoB	Zoar Silt Loam 3-8% Slopes
ZoC	Zoar Silt Loam 8-15% Slopes



Feet
0 1200 2400

Meters
0 300 600

N W E S

Archaeological Study Area
Soil Type Boundary
Stream

Figure 3
Soils in the Study Area

MARKOSKY

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
Source: USDA NRCS 2019

On the floodplain of Cobun Creek, soils are mapped to the Lobdell silt loam (Lb) soil series. Lobdell silt loam is moderately well drained, fine loamy alluvium derived from sedimentary rock (USDA, NRCS 2019). Lobdell silt loam exhibits a typical profile of A-Bw-BC-Cg1-Cg2.

The other prominent mapped soils include Gilpin-Culleoka-Upshur silt loams (GuC and GuD), Clarksburg silt loam (CkC and CkD), or Zoar silt loam (ZoB). Gilpin-Culleoka-Upshur silt loams occur on ridge shoulders, backslopes, and summits, are well drained, and consist of fine-loamy to clayey residuum weathered from sedimentary rock (USDA, NRCS 2019). Gilpin-Culleoka-Upshur soils exhibit variable profiles that can be collectively generalized as Ap-Bt-C. Clarksburg silt loam occurs on hillslopes and hills, is moderately well drained, and consists of fine-loamy colluvium derived from sedimentary rock (USDA, NRCS 2019). Clarksburg silt loam exhibits a typical profile of Ap-BE-Bt1-Bt2-Btx-BC-C. Zoar silt loam occurs on terraces, is moderately well drained, and consists of old silty and clayey lacustrine deposits (USDA, NRCS 2019). Zoar silt loam exhibits a typical profile of Ap-BA-Bt1-Bt2-Bt3-Cg. Throughout the study area, these soil profiles are intermittently capped by various fill episodes.

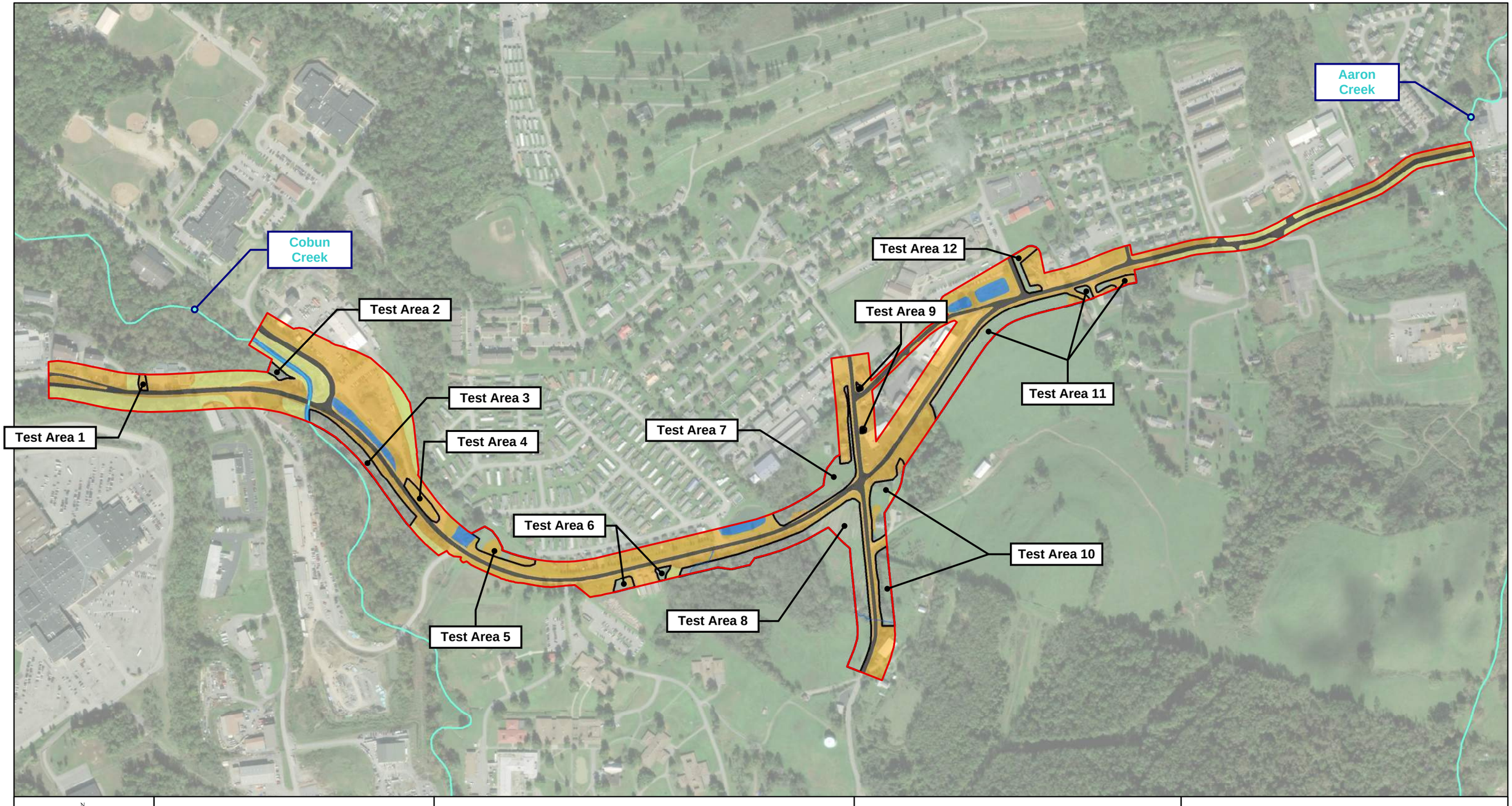
2.4 Drainage and Hydrology

The study area lies within the Monongahela River drainage basin, drained principally by Cobun Creek and its tributaries, as well as by Aaron Creek. Cobun Creek is a third-order perennial stream that meets the Monongahela River ca. 1.3 km (0.8 mi) northwest of the study area. Cobun Creek has been substantially altered by development within and around the study area. Most notably, approximately 300.0 m (984.3 ft) northwest of the study area, Cobun Creek is dammed to form the Cobun Creek Reservoir, a 40-million-gallon backup supply reservoir for the City of Morgantown, managed by the Morgantown Utility Board (Beard 2018). Aaron Creek is a second-order perennial stream that meets Deckers Creek ca. 1.70 km (1.10 mi) north of the study area. Aaron Creek has also been altered by development in the vicinity of the study area.

Within the study area, the unnamed, perennial, first-order tributaries of Cobun Creek also exhibit extensive alteration from development. A ca. 1990s man-made pond is located north of Greenbag Road, immediately west of Test Area 7 (**Figure 4**). This pond appears to have been constructed on a natural spring that now fills the pond. This spring and pond remain the source of an unnamed tributary that travels south from the pond beneath Greenbag Road via a culvert. Two other unnamed tributaries join this spring-sourced tributary in the vicinity of Test Area 8 of the study area (see **Figure 4**). These unnamed tributaries have been substantially re-routed by culverts and drainage ditches for improved agricultural field drainage and for improved drainage along Greenbag Road. From the vicinity of Test Area 8, these tributaries merge to form a single tributary that meets Cobun Creek ca. 460.0 m (1,509.2 ft) southwest of the study area.

2.5 Contemporary Flora and Fauna

West Virginia is the third most forested state, with 79 percent of the state covered by forest (USDA 2017), however, Monongalia County remains only 56 percent forested (Oswalt et al. 2017). The original forest cover of the study area in particular has seen extensive alteration from



N
W E
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Feet
0 250 500 750 1,000

Meters
0 100 200 300 400

MARKOSKY

Archaeological Study Area
Roadway
Disturbed
Stream
Test Area Location
Slope
Wetland

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 4
Archaeological
Study Area Overview

historic and modern clearance of the land for timber, agriculture, and subsequent commercial development. In regions where forest cover persists, the predominant forest type is oak/hickory, covering 74 percent of the forested land of the state (USDA 2016). Only very limited stands of forest are present in the study area, including stands of mixed hardwoods along Cobun Creek and its tributaries.

West Virginia hosts at least 70 different wild mammals, including predominantly the white-tailed deer, beaver, woodchuck, raccoon, porcupine, cottontail rabbit, river otter, gray squirrel, and opossum (WVDNR 2019a). Beavers, fisher otters, and river otters were once eradicated from the state, but were reintroduced in the early to mid-20th century. Elk, bison, and gray wolves were prominent and important mammals throughout the Holocene, but are no longer present in the state (WVDNR 2109a). Presently, West Virginia has more than 178 species of fish, 300 species of birds, and 57 species of reptiles (WVDNR 2019b), many of which were important resources in the pre-contact and historic eras.

2.6 Contemporary Climate

The study area is characterized by a fully humid, warm temperate climate with warm summers and cold winters (Köppen-Geiger climate classification Cfa) (Kottek et al. 2006). The average winter temperature is 32 degrees F. In summer, the average daily maximum temperature is 72 degrees F. Humidity is higher at night, with the average humidity at dawn being 80 percent. Heavy rain may occur at any time of year, but the severe summer thunderstorms sometimes cause flash flooding of narrow valleys. Rainfall is relatively evenly distributed throughout the year (Wright et al. 1982:2).

2.7 Contemporary Land Use

At the time of the survey, the study area was characterized largely by commercial and residential development and infrastructure (see **Figure 4**). Commercial businesses line large sections of Greenbag Road mostly on the northern side and in the eastern and western portions of the study area. A large trailer park is on the north side of Greenbag Road in the central portion of the study area and residences line the western side of Dorsey Avenue. Stands of trees cover areas of steep slope. Residences and unpaved areas between businesses are often characterized by grassy lawns. On the south side of Greenbag Road toward the eastern side of the study area, there are some areas of grassy meadows and agricultural fields.

3.0 CULTURAL BACKGROUND

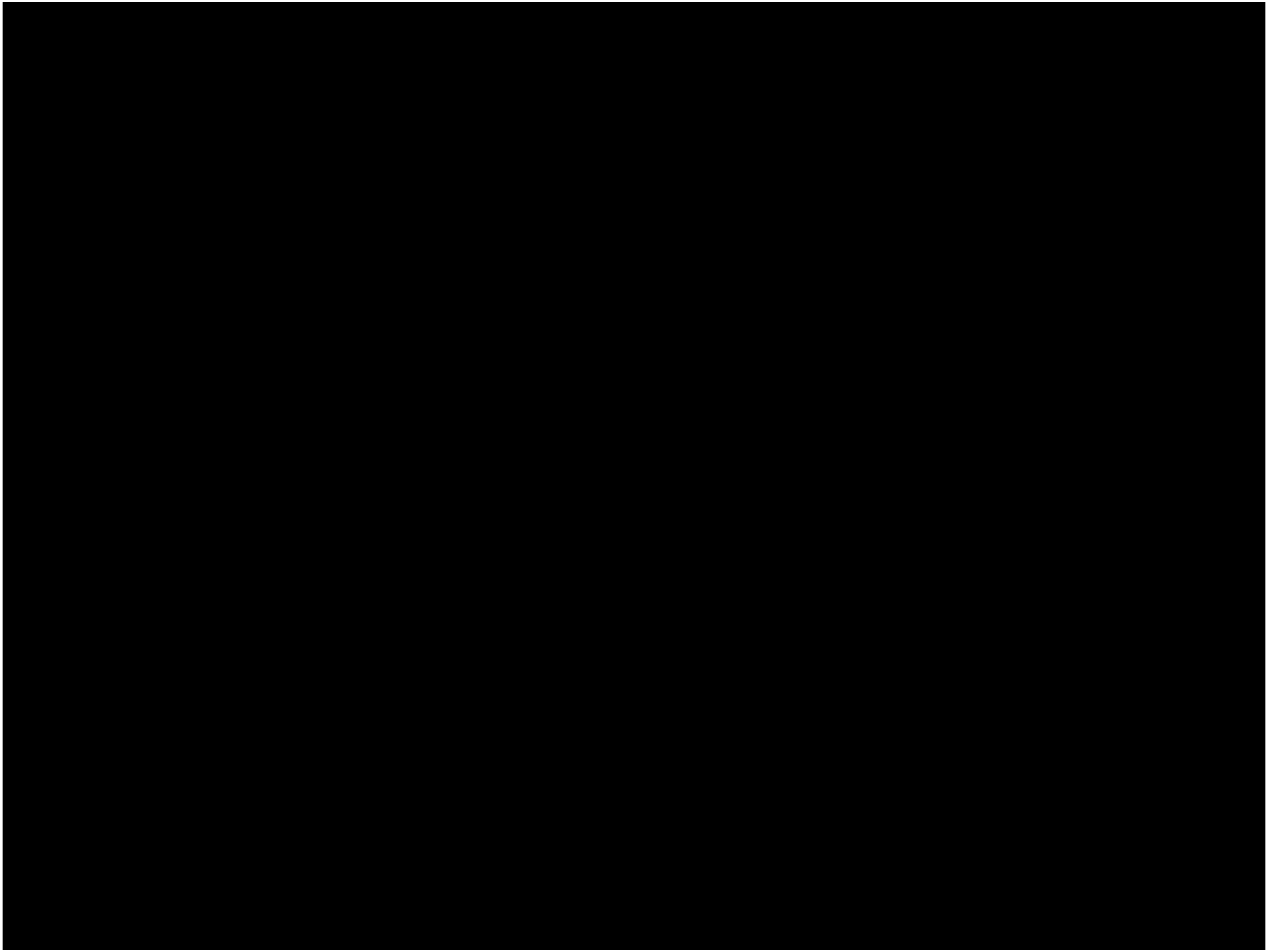
3.1 Introduction

Background research was undertaken and included a review of the West Virginia Site Survey files located on the West Virginia State Historic Preservation Office's Interactive Geographic Information System map (WV SHPO GIS). In addition, a literature review including online resources, archaeological reports, publications, and historic-era maps of the study area and of Monongalia County were consulted to inform the pre-contact and historic context.

3.2 Previously Identified Archaeological Sites

A review of the West Virginia Division of Culture and History (WVDCH) site files accessed through the WV SHPO Interactive GIS Map indicated that no previously identified archaeological sites are located within the study area [redacted]







3.3 Pre-Contact Period

3.3.1 Paleoindian Period (16,000-10,000 Years B.P.)

The Paleoindian Period is identified as the earliest form of human habitation in the Mid-Atlantic and the broader Americas. Inclusive of both Pre-Clovis and Clovis cultures and technologies, the number of Paleoindian sites regionally are thin (Weed 2004), but are characterized by such sites as Meadowcroft Rockshelter (e.g., Adovasio et al. 1978; Adovasio 1993; Carr and Adovasio 2002), Shawnee-Minisink along the Delaware River (e.g., Gardner 1974), and Cactus Hill (McAvoy and McAvoy 1997), to name some of the most prominent. The Paleoindian period in West Virginia is significantly understudied. No radiocarbon dates for the period yet exist in the state. A comprehensive report of known Paleoindian artifacts from West Virginia was undertaken in 1967 (Broyles 1967). Another report was published recently (Rosencrance 2018).

Highly mobile, Paleoindian populations lived during the late glacial maximum (22,000-14,000 B.P.) and into the first major deglaciation of the ice sheet when rapid and extreme climatic change occurred at approximately 14,000-9,000 B.P., the most dramatic of which occurred at about 13,000 B.P. (Vento et al. 2008:14). This was followed by the Younger Dryas (approximately 11,000-10,000 B.P.) that illustrated a significant climate reversal from the previously warmer deglaciation phase. During this time, the “circumpolar vortex expanded

equatorward while strengthening significantly and extending boreal conditions equatorward" (Fitting 1968; Ritchie 1979; Vento et al. 2008:15).

During the Late Pleistocene, West Virginia was characterized by boreal forests dominated by pine, spruce, and fir. At Cranberry Glades in West Virginia, Watts (1979) documented the transition of the environment from the boreal forest to one rich in more mesic or hardwood species shortly after 14,000 cal years B.P. After 11,600 cal years B.P., the environment shifted to a more xeric deciduous forest with oak, chestnut, and hickory (Watts 1979). The wooded settings allowed for a wide hunter-gatherer diet (MacDonald et al. 2003; Steegman 1983) of wild game fauna and botanical remains of wild plants and nuts, supported by even various early studies of Paleoindian sites (e.g., Carlisle and Adovasio 1982; Dent and Kauffman 1985).

Paleoindian populations made specific choices regarding "short-term" settlement. In western New York, evidence of Paleoindian activity is prominent on elevated locations, such as hills or knolls along major drainages (Ritchie 1980; Weed 2004:3-81), and specifically on the edges of marshes and the margins of paleo-period lakes. In Pennsylvania, Lantz (1985) noted a preference for first or second order streams, particularly "on small headwater runs" (Lantz 1985:177), similarly identified by MacDonald et al. (2003:31) as locations of short term encampments. Moreover, Weed (2004:3-82) notes in adjacent watersheds that lowland and upland settings are equally preferred. Most of the Paleoindian artifacts recovered in West Virginia have been found on terraces along the Ohio and Kanawha rivers systems. In part, the recovery of artifacts along these rivers may be related to greater modern development, but may also indicate the use of the river system as a travel route into the higher elevations to the east (Anderson and Gillam 2000; Rosencrance 2018:72). Late Paleoindian artifacts in West Virginia are reportedly recovered from the higher elevations of the eastern part of the state. This may indicate that the warmer climate in the early Holocene, created a biological setting in these upland areas that was more rewarding for foraging groups in this period (Rosencrance 2018:74).

The Younger Dryas was a time of more effective precipitation favoring active lateral channel migration and greater stream discharges. The basal sands and gravels that consistently underlie early Holocene age vertical accretion deposits date to the Younger Dryas (Vento et al. 2008:16). Vento et al. (2008) also suggests the renewed aggression of the rivers and streams during this time may in part be responsible for the scarcity of recorded Pre-Clovis and Clovis Period sites along low terraces, in reference to the discussion of settlement patterns above. In addition, many of these sites were prone to erosion during early Holocene flood events and subsequent smaller channel migration due to the height of the early Holocene terraces above the active river channels (Vento et al. 2008).

Paleoindian populations exhibit specialized craftsmanship in their lithic reduction, diagnostically producing large fluted points, unifaces and bifaces, and diminutive blades from cores via indirect percussion (Adovasio et al. 1998). The most recognized point of this period is the Clovis point, which has been found in West Virginia, most recently in Tyler and Randolph Counties (Rosencrance 2018:73). Paleoindian projectile points were often manufactured from high-quality, non-local materials (Carr and Adovasio 2002); however, local lithic resources of the

period in West Virginia include Hillsdale chert and Kanawha chert (Brashler and Lesser 1990; Rosencrance 2018:74). Their toolkits also contained materials made from wood, bone, and included basketry (Adovasio et al. 1998).

3.3.2 Early Archaic Period (10,000-8,000 Years B.P.)

The transition of the Paleoindian into the Early Archaic was smooth, and specifically within the Appalachian Plateau, was a continuation of mobility patterns involving the selective use of habitat (Raber et al. 1998:126). Weed (2004:3-87) suggests the differences between the two periods likely only represents adjustments to the tool kit to accommodate an increasing variety of floral and faunal resources. Johnson and Siemon (1991) and Adovasio et al. (1998) would generally reflect this idea, but suggest a more gradual change "without significant discontinuities" (Adovasio et al. 1998:22), and the adjustments in the tool kit are more likely associated with the hunting of white-tailed deer. More broadly, this was also a time when the Younger Dryas was displaced by another abrupt warming phase beginning at about 10,000 B.P. (Vento et al. 2008:14), dominated by the modern-like Mixed Mesophytic forest (Carr 1998b). The resulting new forests were likely composed of more fir, white pine, oak, hemlock, alder, birch, and others (Vento et al. 2008:18). The coniferous forests that were in retreat contained few food resources, as compared to the nuts, berries, and herbs of the expanding deciduous forests (Stoltman and Baerreis 1983).

The Boreal Period (9,000-8,000 B.P.) marked a transition from the Pre-Boreal to the wetter Atlantic period, and illustrated warmer and drier conditions. At this time, the rivers in the region established a clear meandering channel habit (Vento et al. 2008:19). The basal sands and gravels of the Younger Dryas were overlain by variable finer grained overbank deposits. However, by the end of the Early Archaic, streams began to stabilize their courses, making some floodplain settings more habitable (Coppock et al. 2010).

In response to the environmental changes, as indirectly noted by Weed (2004:3-87) above, the transition into the Early Archaic period carried with it new point forms and styles including corner-notching and stems (Adovasio et al. 1998), some with deep lateral edge serrations (MacDonald et al. 2003:35). Groups began to become more dependent on more local lithic sources, such as Ten Mile, Uniontown, Monongahela, and Kanawha (MacDonald et al. 2003). Parallel to these shifts, some (Carr 1998b; Stewart and Kratzer 1989) suggest the region likely sustained a slight population increase during this period. However, this difference may also, in part, be due to a biased sample size due to certain landforms that were prone to increased erosion during the Younger Dryas in the Paleoindian Period.

Settlement patterns across the Plateau consisted of macro and microband base camps, hunting and gathering stations, and certain specialized site types (e.g., Adovasio et al. 1998). Base camps occurred along major and minor tributary drainages, while hunting and gathering stations were more widely distributed and not as closely linked to permanent water sources (Weed 2004:3-90).

3.3.3 Middle Archaic Period (8,000-5,000 Years B.P.)

Archaeologically, few differences distinctly characterize the Middle Archaic, and it was largely reflective of a continuation of the Early Archaic, including site frequency (Adovasio et al. 1998; MacDonald et al. 2003:41) and technological continuity (e.g., Stewart and Cavallo 1991). However, the greatest distinction of the Middle Archaic is often associated with the emergence of the bifurcate point bases (Carr 1998a; MacDonald et al. 2003; Weed 2004), which was a stylistic change that began emerging during the end of the Early Archaic. Marble (2011:49) notes the greater variety of grinding tools such as mortars and pestles indicate an increased reliance on plants in their diet and an expanded resource base.

This time is also marked by the wetter Atlantic Climatic Episode that emerged at approximately 8,000 B.P. and extended to 4,500 B.P. During this time, the pollen record for the Upper Ohio, upper and central Delaware, and Susquehanna River Drainage basins shows a rapid decrease in pine, but an increase in both oak and hemlock (Vento et al. 2008:19). Vento et al. (2008) also notes that if basal dates of 8,000 B.P. are present at a site location, then the paleosol is typically overlain by a thick package of fine grained overbank deposits of continuous (8,000-4,500 B.P.) low magnitude flood deposition. Regardless, long term stability of floodplains is evident through the Atlantic Period.

Base camps during the Middle Archaic are typically well positioned on Holocene-age river terraces, while smaller resource procurement stations for seasonal flora and fauna exploitation are located in upland settings (Cowin 1991; Weed 2004:3-107). Not surprisingly, then, lithic reduction stations are near bedrock outcrops (Funk 1991; Weed 2004). All of which is a settlement system that seems to parallel the stabilization of stream courses at the end of the Early Archaic (Coppock et al. 2010).

3.3.4 Late Archaic Period (5,000-3,000 Years B.P.)

Cyclonic storms increased in frequency after the Atlantic, and as early as 6,000 B.P. in the Middle Archaic, resulted in high alluvial deposition (Vento et al. 2008:22), which then continued into the Late Archaic. Stratigraphic evidence of coarse-grained vertical and lateral accretionary deposits is evident along first, second, and third order tributaries indicating the occurrence of large storms after 6,000 B.P. (Knox et al. 1981).

The decline of hemlock, then, during the Sub-Boreal (approximately 4,500-3,000 B.P.) indicates warm and dry conditions during this time (Turnbaugh 1977; Vento et al. 2008), which may also lend to the general absence of well-developed cumulic A-horizons and associated floodplain instability (Vento et al. 2008), which may also be recorded at Meadowcroft Rockshelter (Campbell et al. 2008).

Population increases are noted across the Middle Atlantic (Custer 1988). An increased availability of resources stimulated population growth, increased the use of subsistence and settlement patterns, and began to lead the way to widespread regional exchange networks (MacDonald et al. 2003:49). Resource exploitation became well defined (e.g., Cowin 1991;

Raber 1995) and riverine resources are well used (e.g., Lothrop 2001) and perhaps preferred (Weed 2004). Smaller hunting and extractive camps utilized a wider range of landforms and focused on the more seasonally diffuse or restricted resources in the hinterlands on small streams, adjacent to marshes, and near large springs in the uplands (MacDonald et al. 2003; Ritchie 1980; Weed 2004).

Certainly a major hallmark of the Late Archaic is the appearance of the Brewerton projectile point in combination with the onset of the Laurentian Tradition (Cowin 1991; Dragoo 1959; Justice 1987:115; Weed 2004:3-117), among others, such as Steubenvilles and Lanceolates (MacDonald et al. 2003:49-50).

The ending dates for the Late Archaic are highly variable due to the varying opinions on how to define and separate the continuum of human behavior that in some ways better parallels earlier Archaic periods in addition to what is typically associated with increasingly Woodland sedentism. The transition of activities is very complex during this time, and some have attempted to define a Transitional Archaic. For simplicity purposes, and in the face of variable opinions based on yet lacking firm evidence with a larger dataset to counter otherwise, the Late Archaic is defined here as ending at about 3,000 B.P., or the end of the Sub-Boreal. However, for example, MacDonald (2000) would argue the Late Archaic ends at 3,800 B.P. and Raber (1985:31) at one point noted a Terminal or Transitional Period ranging from 3,800-3,000 B.P.

3.3.5 Early Woodland Period (3,000-1,900 Years B.P.)

The Early Woodland Period represents an increased sedentary lifestyle and is illustrated by longer periods of site use (Marble 2011; Mouer 1990). However, communities are not yet fully sedentary, but remain semi-sedentary (Stewart 2003:7) and should be more accurately identified as being a dominant hunter-gatherer society (Clay 1991). The foods that were hunted and gathered are little different from those that were sought during the Archaic; however, some plant experimentation and limited cultivation occurred (McConaughy 2015), but at no greater extent than some early horticultural practices and it is unclear if subsistence crops were yet grown in any quantity to supplement the wild food diet.

Some widespread trade and exchange networks have been proposed between regions (Stewart 1989; Stewart 2003), the data of some extending from burials (Klein 2003:124). Adovasio et al. (2003) suggest the squash seeds and maize that appear at Meadowcroft Rockshelter are non-native cultigens, which is suggestive of regional interaction. Regardless, experimentation on the domestication of various plant species occurred through conscious and unconscious selection of attributes that were favorable (King 1985), gradually gaining greater importance through the Early Woodland (Clay 1991). During this time, the mean climate abruptly shifted at the beginning of the Early Woodland (approximately 3,000 B.P.) to a warm and moist climatic condition, beginning the Sub-Atlantic (3,000-1,750 B.P.) (Vento et al. 2008).

Another hallmark of the Early Woodland is the appearance of elaborate burial mounds for higher status individuals, which appeared during the Cresap phase (2450-1950 B.P.) (McConaughy 2015), and are associated with the Adena culture (Weed 2004). Although not greatly

widespread nor as prominent in portions of Pennsylvania and West Virginia (Dragoo 1963), the mounds represent a shift in mortuary practices and likely belief systems, most frequently occurring on alluvial terraces of major streams and rivers, while resource extraction camps were typically located in the uplands and along smaller streams (MacDonald et al. 2003:69; Schweikart 1998). New point typologies also appeared (Adovasio et al. 1998), and both Flint Ridge and Upper Mercer cherts were commonly used by the Adena for ceremonial tool production (MacDonald et al. 2003).

3.3.6 Middle Woodland Period (1,900-1,100 Years B.P.)

The warm and moist Sub-Atlantic ended around 1750 B.P. and transitioned to a cooler and moister Scandic (1750-1200 B.P.), which effectively halted A horizon development due to large frequent floods. Instead, rapid vertical accretion, illustrated through poorly developed B horizons and coarse grained C horizons, occurred on low terraces in the region (Vento et al. 2008:23). Archaeologically, little is known of the Middle Woodland Period in West Virginia due to the paucity of excavated sites that provide chronological anchoring. Much of what is known is pulled regionally from intensive excavations of sites specifically identified as Hopewell, and although lean on their own, research in the Susquehanna River Valley and in the Piedmont. Although far greater in socioeconomic and cultural complexity than currently known, the most accurate characterization of the Middle Woodland in the project area is to describe it is a continuation of trends that were initiated during the Early Woodland. Adovasio et al. (2003) view the identification of the transition of Early to Middle Woodland in degree rather than kind. These trends consist of increased sedentism, burial ceremonialism, the increased importance of cultigens, and interregional exchange (MacDonald et al. 2003:87); however, the degree to which any single group participated in networking and trading is extremely variable (Stewart 2003:12).

In the lower and middle Ohio River Valley, the Hopewell cultural influence was dominant and clearly influenced portions of the Upper Ohio Valley, as well (MacDonald et al. 2003). Ceramic styles and forms became increasingly variable, were constructed better, and became more decorative (McConaughy 2000 in MacDonald et al. 2003; Marble 2011). Chipped stone technologies included the appearance of Raccoon-notched and Snyders points, and in addition, increases in ground stone tools indicated an increasingly diverse diet (Mayer-Oakes 1955). However, a majority of sites are indicative of small base camps (e.g., Marble 2011; Stewart 2003), and may indicate smaller kin groups were traveling together. Stewart (2003:24) suggests farming practices are more efficient and less expensive when combined with hunting and gathering in small family groups.

3.3.7 Late Woodland Period (1,100-400 Years B.P./Late Prehistoric A.D. 1600-ca. 1750)

The Period begins with the return to the warm and moist conditions of the Neo-Atlantic (1100-750 B.P.), and ends with the Pacific (700-400 B.P.) that reversed the climate back to cooler and moister conditions similar to those in the Middle Woodland (Vento et al. 2008).

Settlement patterns are increasingly evident on lowland settings due to the increasing dependence on diverse agricultural production with accompanying needs for reliable water

supply and fertile soil (Weed 2004). Permanent villages are more frequently established that are more focused on domesticated and grown foodstuffs (Marble 2011:85). Interestingly, pollen studies from alluvial contexts indicate high percentages of grass, vetch, and Chenopodium sp. occur in alluvial deposits less than 2,000 years old, which are plants often associated with disturbance events. These events may be the result of cultural alteration of the natural floodplain or natural deforestation associated with burning, clearing, and cultivating forest space prior to European cultivation (Gooding 1981; Scully and Arnold 1981), often appearing as charcoal flecking in late Holocene deposits (Vento et al. 2008).

The Monongahela culture was dominant in northern West Virginia, and adjacent areas of Ohio, Pennsylvania, and Maryland (MacDonald et al. 2003:95). Ceramic diversity continued and food sources became increasingly diverse. Diagnostic ceramic types are often thin, cord-marked and grit-tempered (Marble 2011; Mayer-Oakes 1955). Projectile point styles and forms continued to evolve dramatically, and triangular points such as Levanna and Madison are a common indicator of Late Woodland Period occupation.

Stockaded fortifications are recorded at a high number of village sites, indicating defensive measures used to protect themselves from attacks. Some of these villages, such as the Johnston site along the Conemaugh River (e.g., Chiarulli and Neusius 2010; Dragoo 1956), indicate multiple episodes of reconstructed walls. Smaller camps and procurement sites served as specialized function with multiple periods of reuse (Custer 1996).

3.4 Historic Overview of the Study Area

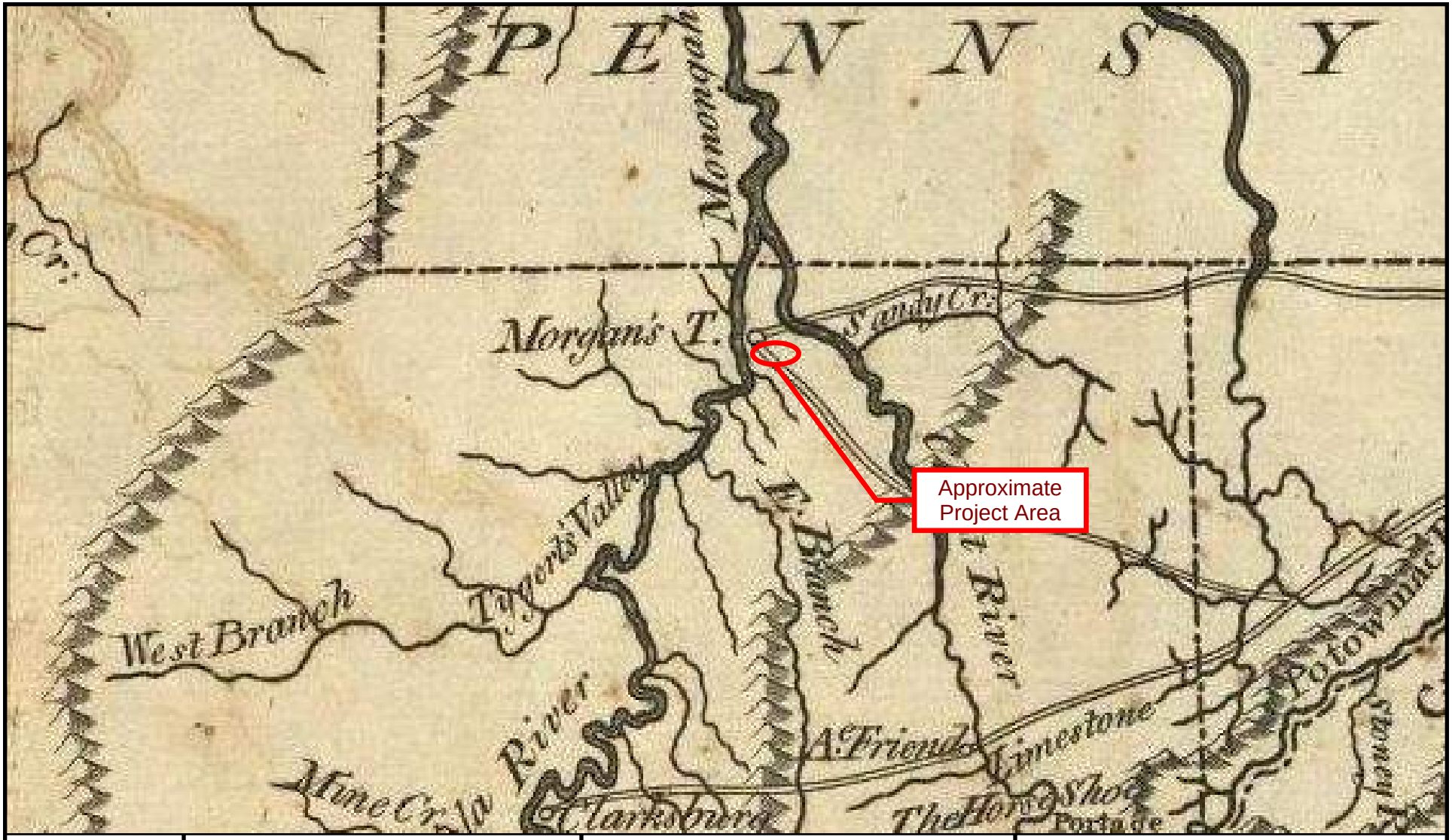
The study area vicinity historically comprised rural farm land owned by a handful of families who settled in the area in the early to mid-19th century. Greenbag Road was constructed in the early 1960s by the Green Bag Cement Company as a bypass road south of Morgantown. Today, the area is characterized by early twentieth century farms and residences; mid-century and non-historic residential development; the FCI Morgantown Kennedy Center complex, a minimum security prison built in 1968 as a juvenile detention center; and large scale commercial and industrial development including the Mountaineer Mall constructed in 1974.

The first Euro-American settlers arrived in the vicinity of the study area and modern day Morgantown in 1758 when Tobias Decker, along with 50 other pioneers, built a rudimentary settlement near Morgantown at the confluence of Deckers Creek and the Monongahela River approximately 2.66 km (1.65 mi) northwest of the study area. This area of what was historically northwestern Virginia and southwestern Pennsylvania was still highly contested between pioneer settlers and Native Americans. When Decker's settlement was raided in 1766, its residents were dispersed to other nearby settlements. That same year, Zackquill Morgan and his brother David registered a land claim and attempted to establish a settlement in the vicinity of what would become Morgantown. Virginia and Pennsylvania also had a longstanding dispute concerning the exact location of Pennsylvania's southern and western boundaries (Carvell 2018).

During the late 18th century, small stockades and forts were established throughout southwestern Pennsylvania and northwestern Virginia as reinforcement for pioneer settlers. Among these strongholds was Coburn's Fort located approximately one mile southwest of the study area, east of the Monongahela River. The fort was established by Jonathan Coburn who arrived in the area around 1770 (Muttillo and Blosser 2018). It is said that the meeting for the organization of Monongalia County was held at Coburn's house in 1776 (Core 1976:379-380). Monongalia County was formed from what was historically known as the Western Augusta district on the western frontier of Virginia. The district had been formed in 1775 and the following year was divided into three counties: Monongalia, Yohogania, and Ohio. Monongalia County, at that time, included land that now constitutes counties in modern day northern West Virginia and southwest Pennsylvania (Carvell 2018). Monongalia County would later become known as the "mother county" of northern West Virginia as so many counties were formed from it (Monongalia County Commission 2018).

Around the time of the formation of Monongalia County, the path of modern day Kingwood Pike was cut through the local wilderness. The road, later referred to as the Morgantown, Kingwood, and Evansville Pike, intersects modern day Greenbag Road within the study area and is noted as the oldest road in Monongalia County in Wiley's *History of Monongalia County, West Virginia* (Wiley 1883:653). The road was established as a pack horse road between 1772 and 1776. Settlers used the road to transport salt and iron from Winchester, Virginia into Monongalia County. The road later provided access to land further west in Ohio (Wiley 1883:536). No discernable structural remains of the turnpike appear to exist in the study area. Around 1783, Zackquill Morgan received a land grant of 400 acres and hired a land surveyor to divide 50 acres along the Monongahela River into lots and lay out streets. Morgan's Town (or Morgantown, as it later became known) was established by an act of legislation in 1785. A stipulation of the purchase of a lot in Morgan's Town was that a structure was to be constructed within five years. This encouraged development and deterred absentee landowners, a problem which often plagued early pioneer settlements (Monongalia County Commission 2018; Carvell 2018; WVGenWeb 2010).

In 1793, the *Pittsburgh Post-Gazette* began newspaper delivery to Morgantown which prompted the construction of an early north-south route between the communities. This, in addition to the discovery of iron ore in the nearby ridges, helped to jumpstart growth in Morgan's Town (WVGenWeb 2010). A 1795 map of Virginia illustrates Morgan's Town on the east bank of the Monongahela River, as well as the general vicinity of the study area (**Figure 6**). Two established roads are illustrated leading to Morgantown from Maryland; the road traveling southeast of Morgan's Town is likely modern day Kingwood Pike. No other settlements are indicated in the



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*Not to Scale.

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Figure 6
Approximate Project Area in 1795

MARKOSKY

Monongalia County
West Virginia
Source: Lewis 1795

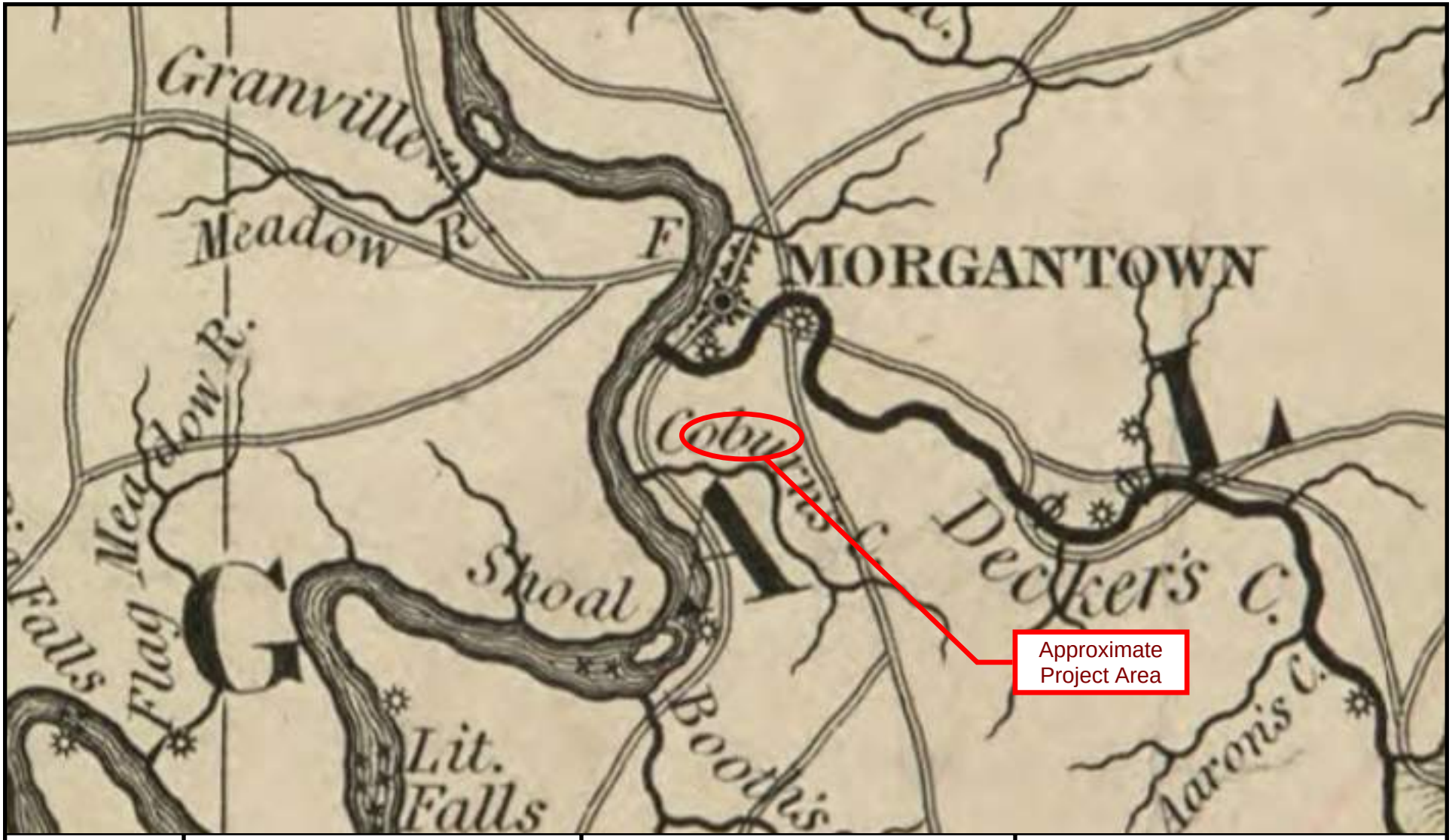
area, and the closest identified towns were Pittsburgh, Pennsylvania to the north and Fort Cumberland, Maryland to the east (Lewis 1795).

In 1803, Jonathan Coburn sold his property southwest of the study area to George Dorsey who moved to the area from Elk Ridge, Maryland, a suburb of Baltimore. The natural rock formation on the property became known as Dorsey's Knob and functioned as a tourist attraction beginning in the late 19th century. An 1827 map of Virginia shows the early development around the study area and Morgan's Town, labeled at this time as Morgantown (**Figure 7**). A larger network of early roads is illustrated around Morgantown, while grist mills and iron furnaces were situated along the rivers and smaller streams. Two grist mills and two iron furnaces are illustrated along Deckers Creek (Boye 1827).

Agriculture and iron industries sustained the economy of Monongalia County into the middle of the 19th century. Morgantown was formally incorporated in 1858. Monongalia County supported the Union during the Civil War and Morgantown was briefly raided in 1863, the same year West Virginia acquired its statehood (Carvell 2018). After West Virginia was formed, the Morrill Act of 1863 awarded Morgantown a land grant for a college. Morgantown was considered a favorable location due to the existing academic buildings of the Monongalia Academy (established in 1814) and the Morgantown Female Collegiate Institute (established in 1831). The West Virginia Agricultural College was organized in 1867 and the following year the name of the college was changed to West Virginia University, as it is known today (Carvell 2018).

White's *Topographical County and District Atlas of West Virginia* of 1873 shows a general overview of the study area and nearby Morgantown (**Figure 8**). The road network around Morgantown continued to develop and numerous small communities with established post offices surrounded the city. The county was divided into districts by this time and the study area was illustrated within the Clinton District, although subsequent maps and historical narratives indicate the area encompassing the study area was located within the Morgan District to the northeast. Kingwood Pike is illustrated traveling southeast from Morgantown along the border of the Morgan and Clinton Districts (White 1873).

In 1886, the Fairmont, Morgantown, and Pittsburgh Branch of the Baltimore and Ohio (B&O) Railroad was constructed to Morgantown. The line was eventually constructed to Connellsville, Pennsylvania, providing service from Morgantown to Pittsburgh and Cumberland (Carvell 2018; Frey 2018). An 1886 map of Monongalia County including the Morgan District illustrates the study area and Morgantown (**Figure 9**). The orderly grid of Morgantown is illustrated on the east bank of the Monongahela River. The Fairmont, Morgantown, and Pittsburgh Branch of the B&O Railroad is illustrated traveling along the east bank of the river to its terminus in the southwestern area of the city. The alignment of Kingwood Pike is illustrated traveling through the study area. The Dorsey School House No. 1, the original school building on the site which has since been replaced by a ca. 1920 building, was at this time located at the intersection of Kingwood Pike (labeled on the map as the Kingwood, Morgantown, and West Union Turnpike) and modern day Luckey Lane. No existing road following the modern path of Greenbag Road existed at this time. Members of the Dorsey family were still living in the vicinity of Dorsey's



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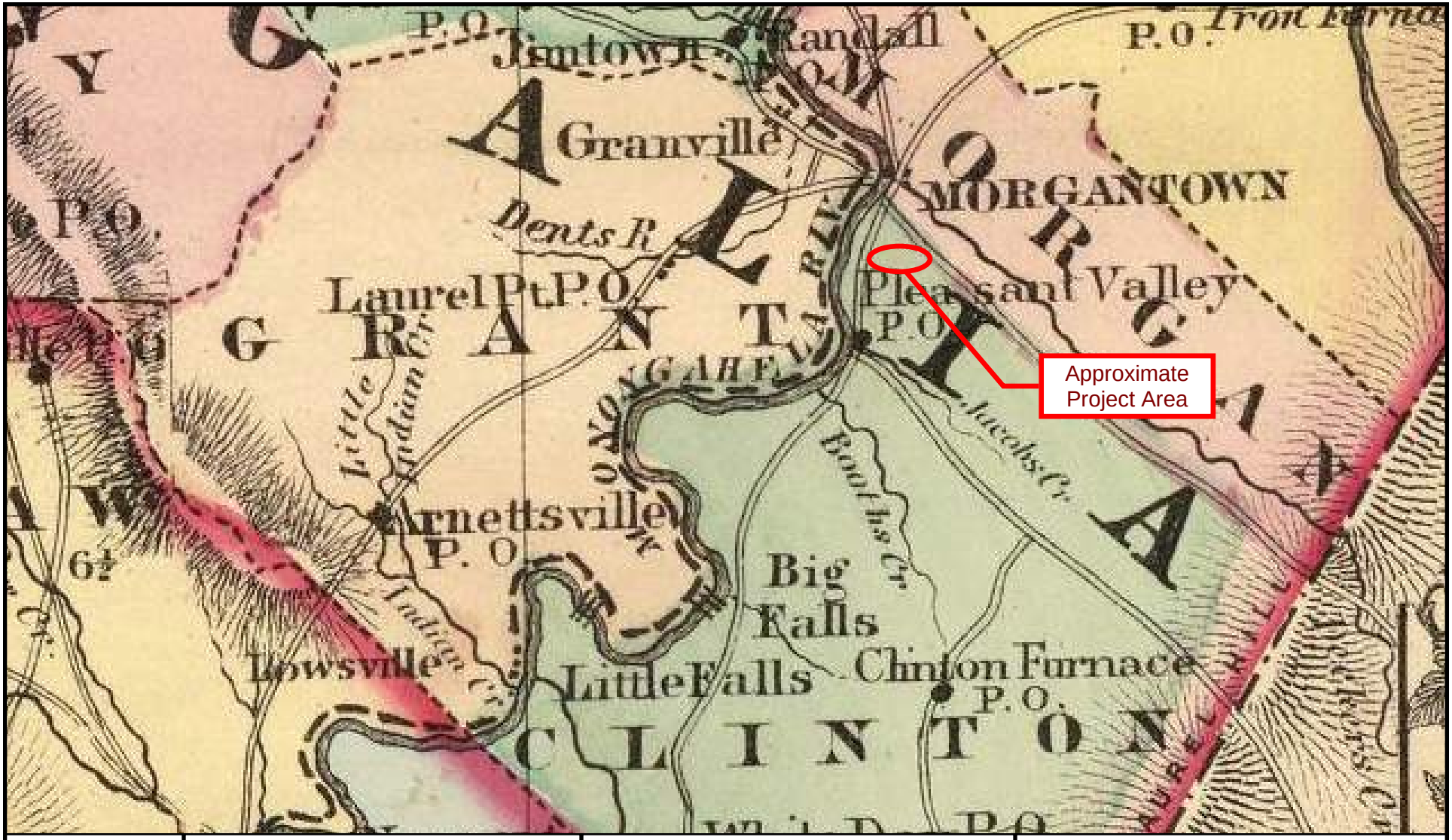
*Not to Scale.

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Phase I Archaeological Survey
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Figure 7
Approximate Project Area in 1827

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Monongalia County
West Virginia
Source: Boye 1827



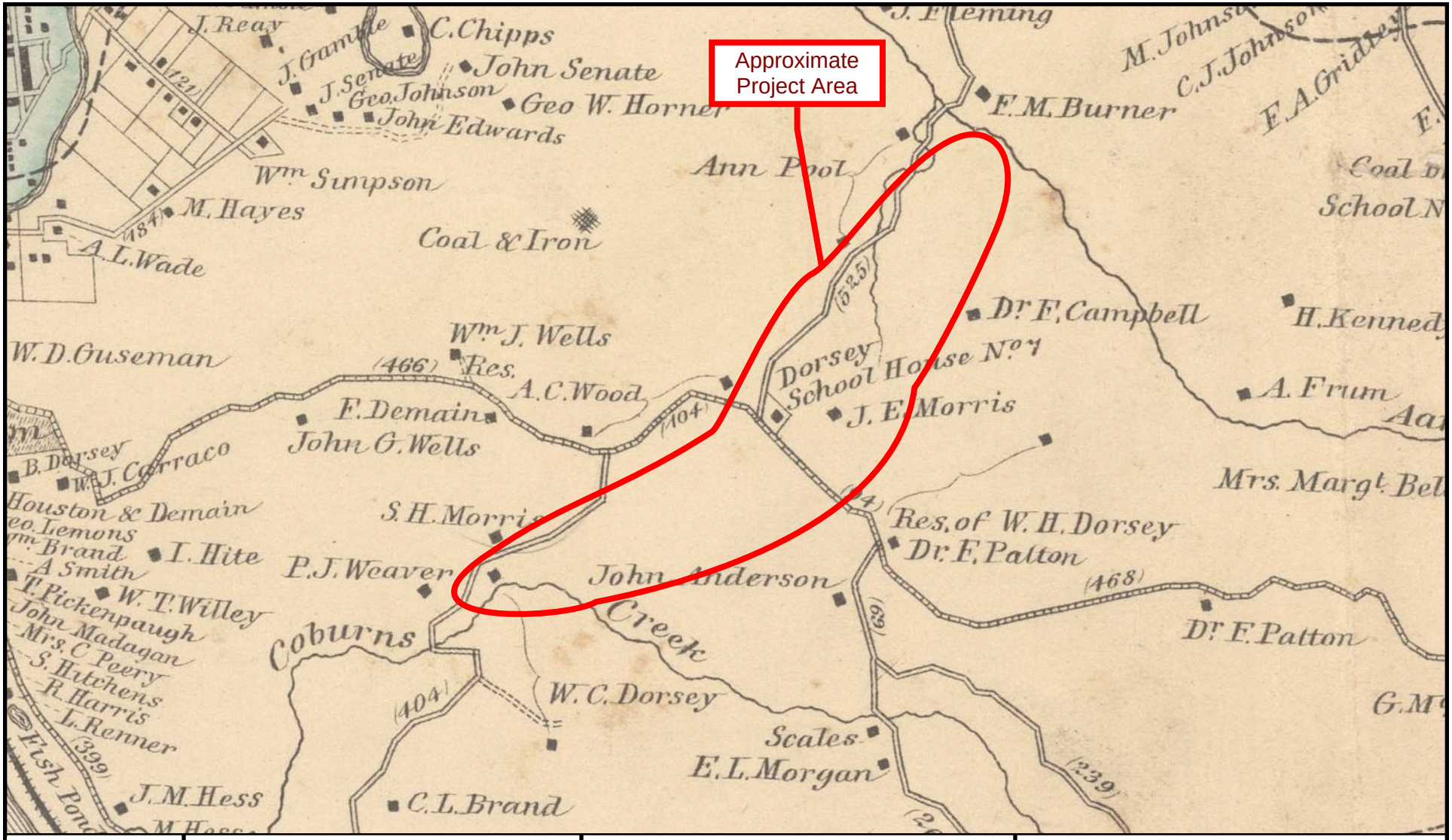
*Not to Scale.

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Phase I Archaeological Survey
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Figure 8
Approximate Project Area in 1873

Monongalia County
West Virginia
Source: White 1873

MARKOSKY



N W E S	*Not to Scale.	Greenbag Road Improvement Phase I Archaeological Survey Abbreviated Technical Report	**Figure 9** Approximate Project Area in 1886
MARKOSKY			Monongalia County West Virginia ***Source: Lathrop 1886***

Knob southwest of the study area. Other surnames in the immediate vicinity of the study area include Anderson, Morris, Patton, and Wood (Lathrop 1886).

Oil was discovered in central Monongalia County (northwest of the study area) in 1889 which prompted an oil boom throughout the county. The Eureka Pipeline Company, a subsidiary of Standard Oil of Ohio which was founded by John D. Rockefeller, was organized in 1890 to transport oil extracted in West Virginia via pipelines. The company acquired a large amount of land along Coburn Creek (referred to presently as Cobun Creek) northwest of the study area and south of Morgantown for a pumping station and storage tanks to hold oil waiting for transport. Eight tanks were constructed by the end of 1890 and seven more were proposed for the following year. Each tank held approximately 25,000 to 30,000 barrels of oil (Core 1982:143-144). Two photographs from 1895 show a collection of oil tanks south of Morgantown dotting the rolling landscape of rural Monongalia County (**Figures 10 and 11**). The close of the 19th century also saw the first coal mines opened in Monongalia County. With an established railroad network and the discovery of the lucrative Pittsburgh Coal Seam in central and eastern Monongalia County, mining companies and workers were drawn to the area (Carvell 2018).

The storage tanks of the Eureka Pipeline Company are illustrated as dots northwest of the study area on a 1902 topographic map (**Figure 12**). The oil tanks were located to the southwest of modern day Dorsey Avenue and mostly north of Cobun Creek. In the vicinity of the study area, a few dwellings were scattered along the existing road network although the area was rural and largely undeveloped. Dorsey Knob is illustrated south of the APE; it was by this time a local tourist attraction and popular picnic spot (USGS 1902). In 1909, the organization of a chapel was proposed after several successful Methodist revival meetings were held at the Dorsey School House. As a result the MG-1332 / Harner Chapel was constructed opposite the school on the north side of Luckey Lane, east of Dorsey Avenue. The chapel was formally dedicated in 1914. The land for the chapel was donated by Fairchild Harner, who owned land in the vicinity of the APE, as well as elsewhere in Monongalia County (The Monongalia Historical Society 1954).

A 1925 topographic map shows additional oil storage tanks constructed within and surrounding the western limits of the study area (**Figure 13**). Morgantown continued to expand to the southwest nearer to the study area. Kingwood Pike was signed as a highway by this time. A church (Harner Chapel) and school (MG-2651 / Dorsey School) are labeled at the intersection of Dorsey Avenue and Luckey Lane, although they are not named as were other churches and schools in the vicinity. The school illustrated on the map is likely the existing ca. 1920 Dorsey School standing at the intersection today. An early road alignment in the vicinity of what would become Greenbag Road is illustrated west of the study area and through the oil tank field (USGS 1925). As Morgantown advanced into the middle of the 20th century, its economy was sustained by the established coal industry which saw a boom during both World Wars. Agriculture supplemented the economy of the county. West Virginia University doubled its enrollment after World War II and the campus expanded rapidly in response (Carvell 2018). While development within Morgantown was steady, little change had taken place in the vicinity of the study area by the middle of the 20th century. A 1957 topographic map shows that some



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Figure 10
Oil Tanks South of Morgantown ca. 1895

Monongalia County
West Virginia
Source: WVU 1895a

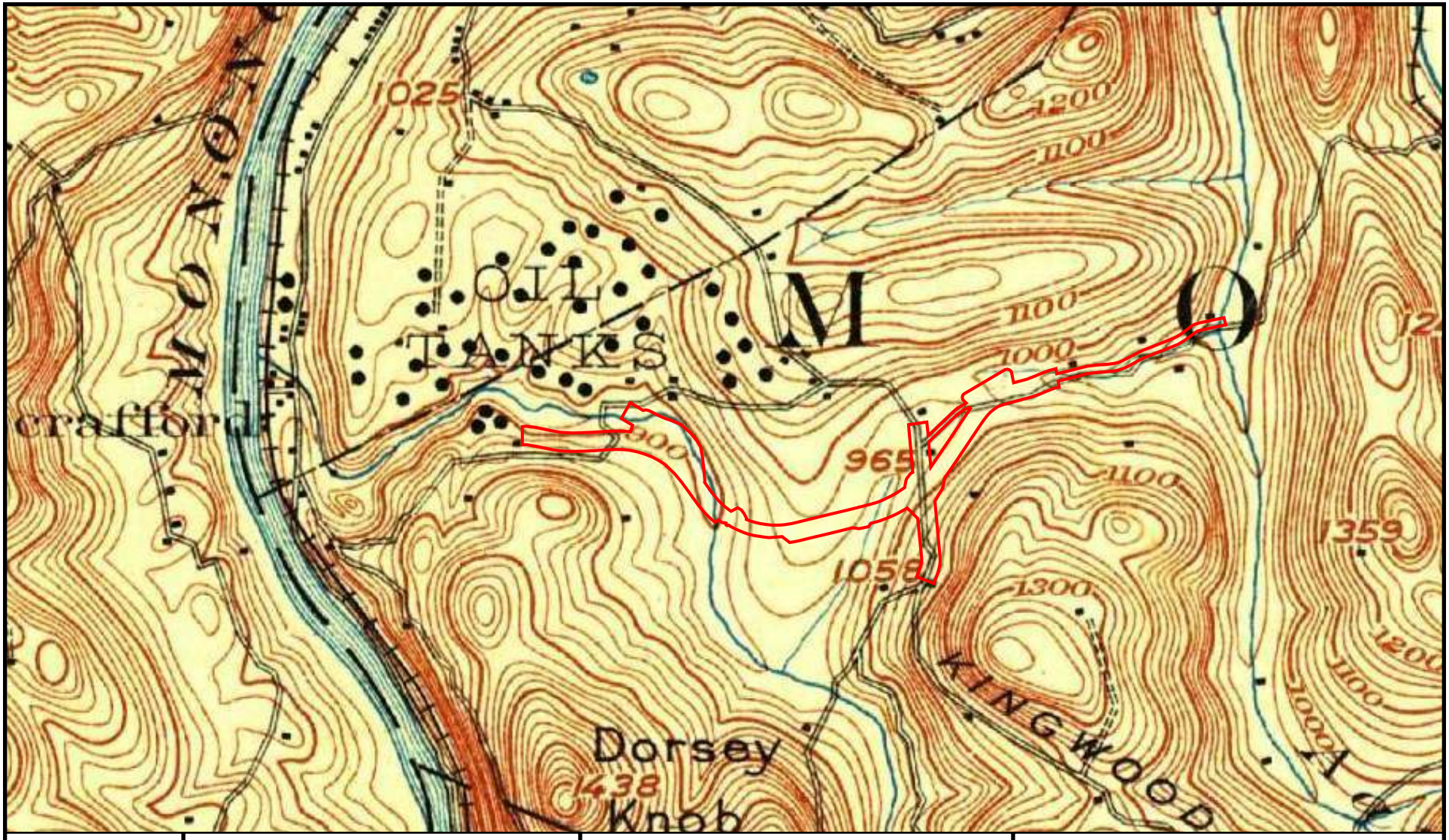


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Figure 11
Oil Tanks South
of Morgantown ca. 1895

Monongalia County
West Virginia
Source: WVU 1895b



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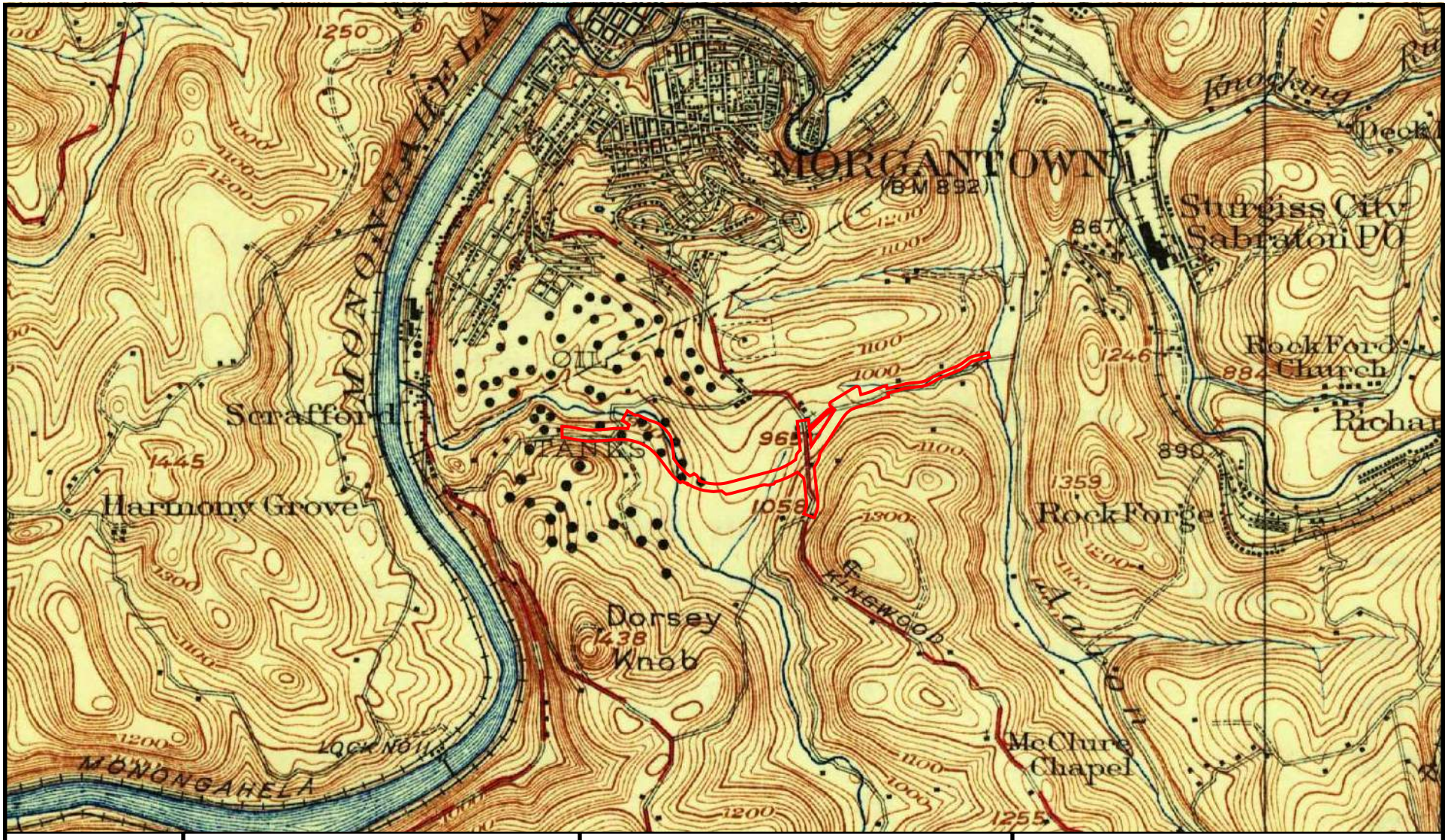
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Archaeological Study Area

Figure 12
Archaeological Study Area in 1902

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Morgan District and City of Morgantown
Monongalia County
Source: 15' USGS Topographic Quadrangle Morgantown, WV 1902



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Meters
0 750 1500

Archaeological Study Area

Figure 13
Archaeological Study Area in 1925

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Morgan District and City of Morgantown
Monongalia County
Source: 15' USGS Topographic Quadrangle Morgantown, WV 1925

additional residential development had occurred at the intersection of Kingwood Pike and Luckey Lane (**Figure 14**). Both Harner Chapel and the Dorsey School are labeled at the intersection. A cemetery is labeled outside of the APE to the west of the church and school. The vast field of oil tanks illustrated in the previous topographic maps was at this time reduced to just three as the oil industry waned within the county by the late 1930s (Allen and Matchen 2017). No extant remnants of the oil tanks or associated infrastructure were noted within the study area.

In the early 1960s, the Green Bag Cement Company of Pittsburgh established a limestone plant on Deckers Creek near Greer, located 9.25 km (5.75 mi) southeast of the study area (WVU 1961a). The company bought land south of Morgantown and west of the study area along the Monongahela River and constructed a loading dock to ship their products to Pittsburgh on barges (Rote 2015:52; WVU 1961b). The company also paid for the construction of a 7.2 km (4.5 mi) bypass road leading from their docks south of Morgantown to Sabraton located roughly 2.35 km (1.46 mi) east of Morgantown and 2.90 km (1.80 mi) northeast of the study area. Greenbag Road, which was named for the company, provided a throughway from Route 119 south of Morgantown to Route 7 near Sabraton (Rote 2015:52). The construction of Greenbag Road began the commercial and industrial development of the rural area surrounding the APE.

The relatively undeveloped and rural setting along Greenbag Road made it an ideal location for the creation of an experimental juvenile detention facility that was constructed just south of the study area in 1968. The Robert F. Kennedy Youth Center (MG-2645), now known as FCI Morgantown Kennedy Center, was designed as a prototype for the experimental penal system model known as “unit management”, a management model in which juvenile offenders were treated more as students and put into groups of 5-200 managed by multidisciplinary teams. (Balchen 1971:15; Kasey 2015:51). The sprawling campus-style complex covers approximately 41.7 ha (103.0 ac) and was built on former farm land likely owned at one time by heirs of George Dorsey.

Development around the study area progressed during the 1960s and into the 1970s. Mountain View Manor (MG-2655), a multi-unit housing complex, was constructed around 1970 north of the study area and west of Dorsey Avenue. A small housing development was constructed behind Mountain View Manor north of the APE on the west side of Dorsey Avenue. The postwar development was typical for the time period and was laid out along three straight, dead end roads extending southwest from Dorsey Avenue (Google Earth 2018). Southwest of the western limit of the study area, the construction of the Mountaineer Mall (MG-2643) in 1974 brought the first large-scale, air conditioned multi-store shopping center to northern West Virginia (Latrobe Bulletin 1975). The construction of the mall prompted more commercial construction in its vicinity on the north side of Greenbag Road. It was also during this time that the Morgantown City Garage (MG-2644) was constructed.

A 1976 aerial photograph shows the study area and vicinity (**Figure 15**) (USGS 1976). The area that was once made up of rural farm land now appears as a developed suburb of Morgantown. The complex of the detention facility, which by this time had been converted to an adult

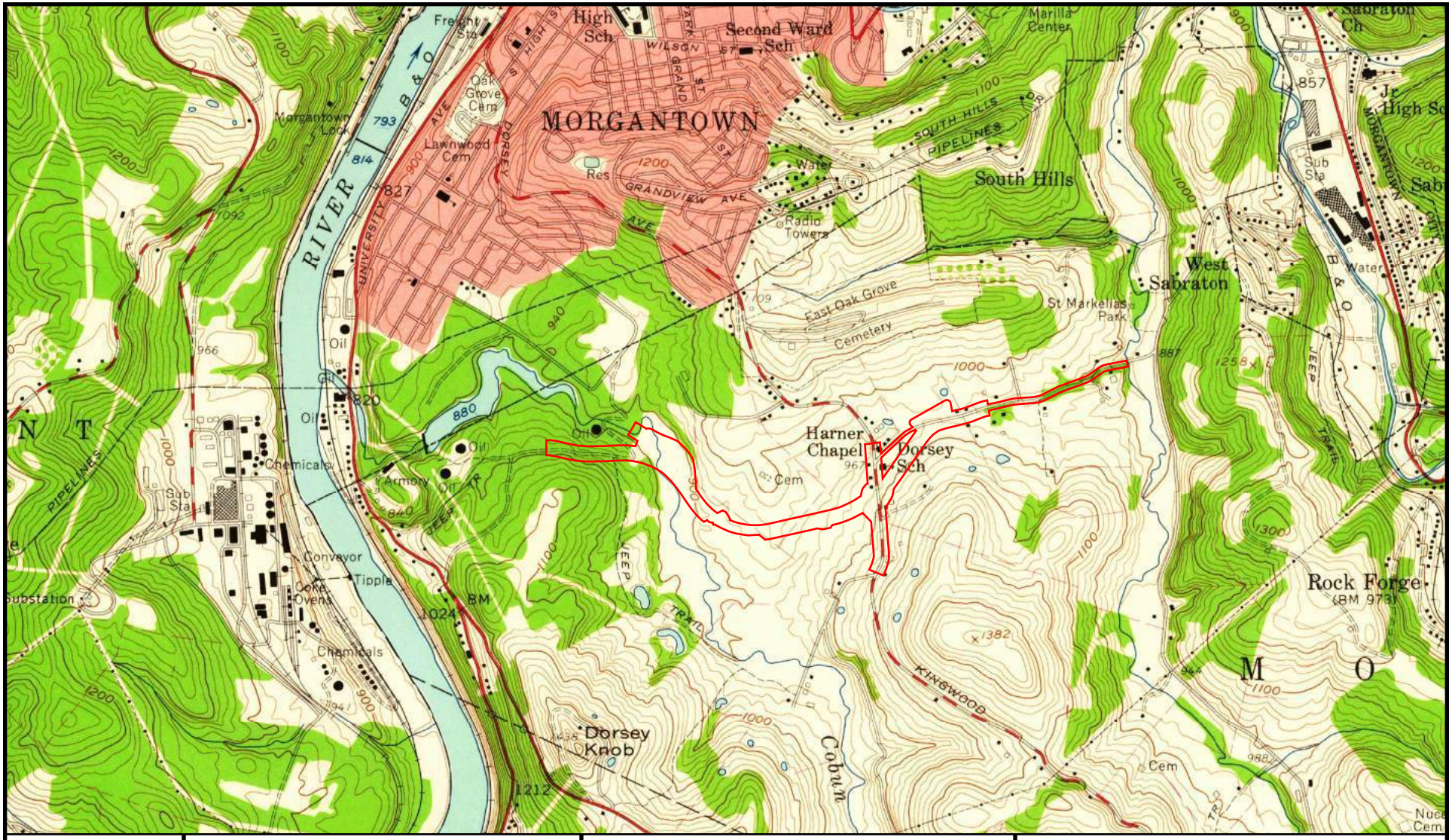


Figure 14
Archaeological Study Area in 1957

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Morgan District and City of Morgantown
Monongalia County
Source: 7.5' USGS Topographic Quadrangle Morgantown South, WV 1957



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Archaeological Study Area

Figure 15
Archaeological Study Area in 1976

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Morgan District and City of Morgantown
Monongalia County
Source: 7.5' USGS Orthophoto Quadrangle Morgantown South, WV 1976

correctional institution, is visible on the south side of Greenbag Road. The housing development north of the study area on the west side of Dorsey Avenue is also visible. Two farms (MG-2646 and MG-2647) are shown on Kingwood Pike south of its intersection with Greenbag Road, and both the Dorsey School and Harner Chapel are visible at the intersection. The Mountaineer Mall is near the western limit of the study area (USGS 1976).

Commercial and residential development north and south of the APE has continued into the 21st century, as evidenced in a modern aerial photograph (see **Figure 3**). Non-historic commercial and industrial development surrounds the Mountaineer Mall, and a large mobile home park is located on the north side of Greenbag Road west of its intersection with Kingwood Pike and Dorsey Avenue. Commercial and residential development has continued along Greenbag Road, particularly east of the intersection of Dorsey Avenue/Kingwood Pike. Today, the heavily trafficked road is one of the main arteries in southeastern Morgantown.

4.0 PHASE I ARCHAEOLOGICAL SURVEY METHODS

4.1 Background Research

The background research was conducted to collect information regarding the environmental setting, pre-contact and historic use of the project area; however, no archaeological resources were identified during the fieldwork. This research included a review of the existing data on known archaeological and historic resources in the project's vicinity. The West Virginia Interactive GIS Map was searched on January 25, 2019 and again on October 21, 2019 for recorded archaeological site data, archaeology report abstracts, and for recently completed archaeology projects in the region. NRHP Files, and Historic Property Inventory files were also reviewed. Information on the history of Morgantown and the surrounding area was collected from the WV SHPO survey files, Ancestry.com, Archive.org, Google Books, USGS.gov, historicmaps.com, and other online repositories. This research included a review of historic maps and atlases, public documents, county and township histories, thematic studies, and historic photographs (where available). Additional research specific to the environmental setting of the project area was conducted in the Markosky project archives and private collections of the authors.

4.2 Archaeological Fieldwork

The Phase I survey utilized standard methods outlined by the WV SHPO guidelines (Trader 2018) to identify archaeological resources within the study area. These methods consisted of a pedestrian survey/visual examination of the entire study area, the excavation of occasional judgmentally placed auger borings to verify the presence of disturbed soils, and subsurface testing of areas determined to be testable. Testable areas were characterized by less than 20 percent slope and contained intact soils of sufficient age to have the potential for archaeological deposits. No portions of the study area exhibited ground surface visibility that was sufficient for surface collection as part of this survey. Areas suitable for subsurface testing were assigned numerical test area designations. Within these test areas, round 50.0 cm (19.7 in) shovel test pits (STPs) were excavated at 15.0 m (49.2 ft) intervals. The STPs were numbered using the test area numerical designation plus a letter designation for the transect and a number for the specific STP on that transect. For example, STP 6A01 refers to the first STP on transect A in Test Area 6. Additional radial STPs were excavated at 5.0 m (16.4 ft) spacing in cardinal directions around positive STPs. Within the STPs, soil was hand excavated by natural/observable soil and screened through 0.64 cm (0.25 in) hardware mesh. One STP was expanded to a 1.0 x 1.0 m Test Unit (TU) during the Phase I survey in order to test to the appropriate depth in soils that were deep due to thick fill layers at the modern ground surface. The TU was excavated by 10.0 cm (3.9 in) levels within natural strata of sufficient thickness and were screened through 0.64 cm (0.25 in) hardware mesh. STP and TU excavations were conducted to a minimum depth of 10.0 cm (3.9 in) into culturally sterile subsoils.

Information regarding the soil texture and color, depth of cultural materials recovered, and other relevant data were recorded on Markosky's standard excavation forms. Daily field notes and excavation information were kept by the field supervisor. Field data were recorded on standardized forms and were supplemented with notes and project maps as warranted. All fieldwork was documented via digital photography. The locations of all STPs and the TU were recorded using a Trimble Geo7x handheld global positioning system (GPS) unit consistently capable of recording data with sub-meter accuracy. Upon completion of each STP or TU, the excavated area was immediately backfilled and the soils tamped. Efforts were made to return the ground surface to its original condition. Due to the location of the STPs along a public roadway system and within residential and commercial lawns, extra time and care was taken to backfill excavations.

No pre-contact or historic period archaeological materials were recovered during the Phase I archaeological survey of the Greenbag Road project.

5.0 PHASE I ARCHAEOLOGICAL SURVEY RESULTS

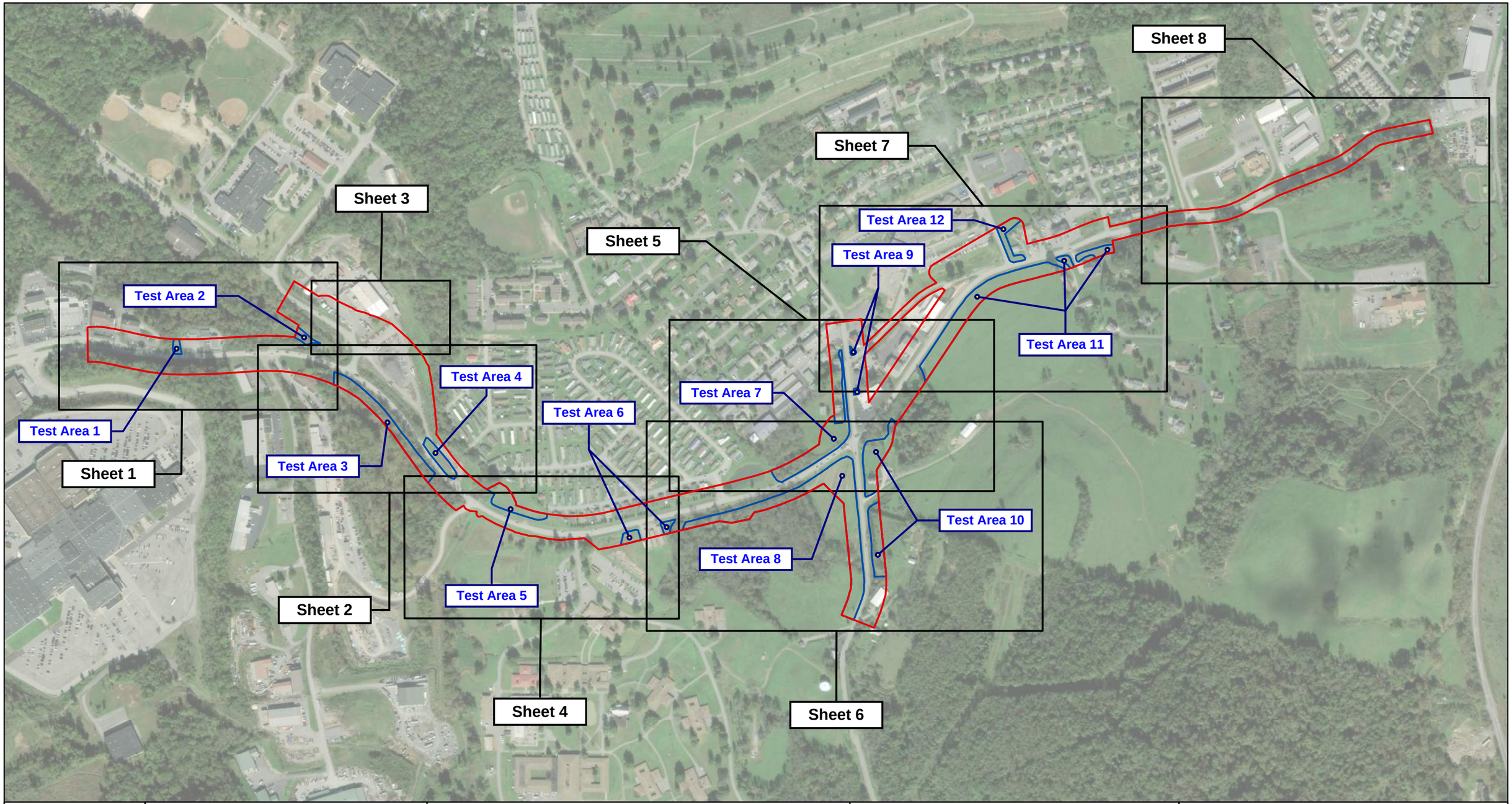
5.1 Introduction

The study area totals 19.96 ha (49.33 ac) in size, of which 0.71 ha (1.76 ac) are wet, 13.23 ha (32.70 ac) are disturbed, 2.40 ha (5.93 ac) are steeply sloped, and 3.62 ha (8.94 ac) were tested. In total, 213 STPs and one TU were excavated within the study area during the Phase I archaeological survey fieldwork (**Figure 16: Sheets 1-8**). Disturbances in the study area have been caused by the existing roadways; residential and commercial development; drainage ditches; buried utility lines including sewer, water, and gas lines; cut slope; grading and fill; and stormwater management areas (**Photographs 1-59)**. Please note that a photograph location map is included in **Appendix B**.

No pre-contact or historic period cultural materials or features were identified; therefore, no archaeological sites were recorded during the Phase I survey. The results of the fieldwork are summarized below by test area. Please note that the soil profiles are summarized in the text and that detailed soil descriptions are included on the corresponding referenced soil profile figures. Also, please refer to **Figure 4** for an overall view of test area locations throughout the study area. Figure 4 shows the 3/29/2019 design on an aerial image background with the results of the Phase I survey. The 3/29/2019 design plan sheets are included in **Appendix C**. There are a few areas on the plan sheets where the design extends outside of the study area. These areas are not yet confirmed as part of the design as of this report submittal and were not surveyed. If any confirmed design changes include areas outside of the surveyed study area, these areas will be surveyed and included in an addendum report.

5.2 Test Area 1

Test Area 1 is located on the north side of Greenbag Road just west of the Mountaineer Veterinary Clinic (see **Figure 16: Sheet 1**). The test area is on an upland landform with elevations ranging from 291.4 to 293.2 m (956.0 to 962.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn (**Photograph 60**). Soils in the test area are mapped as Gilpin-Culleoka-Upshur silt loams, 15 to 25 percent slopes (GuD). The test area is 0.03 ha (0.08 ac) in size. One (1) STP was excavated in Test Area 1. The soil profile consisted of Fill 1-Fill 2-Fill 3-Rock (**Figure 17**). The soils in Test Area 1 were determined to be entirely disturbed. No pre-contact or historic period cultural materials were identified in Test Area 1.



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Archaeological Study Area

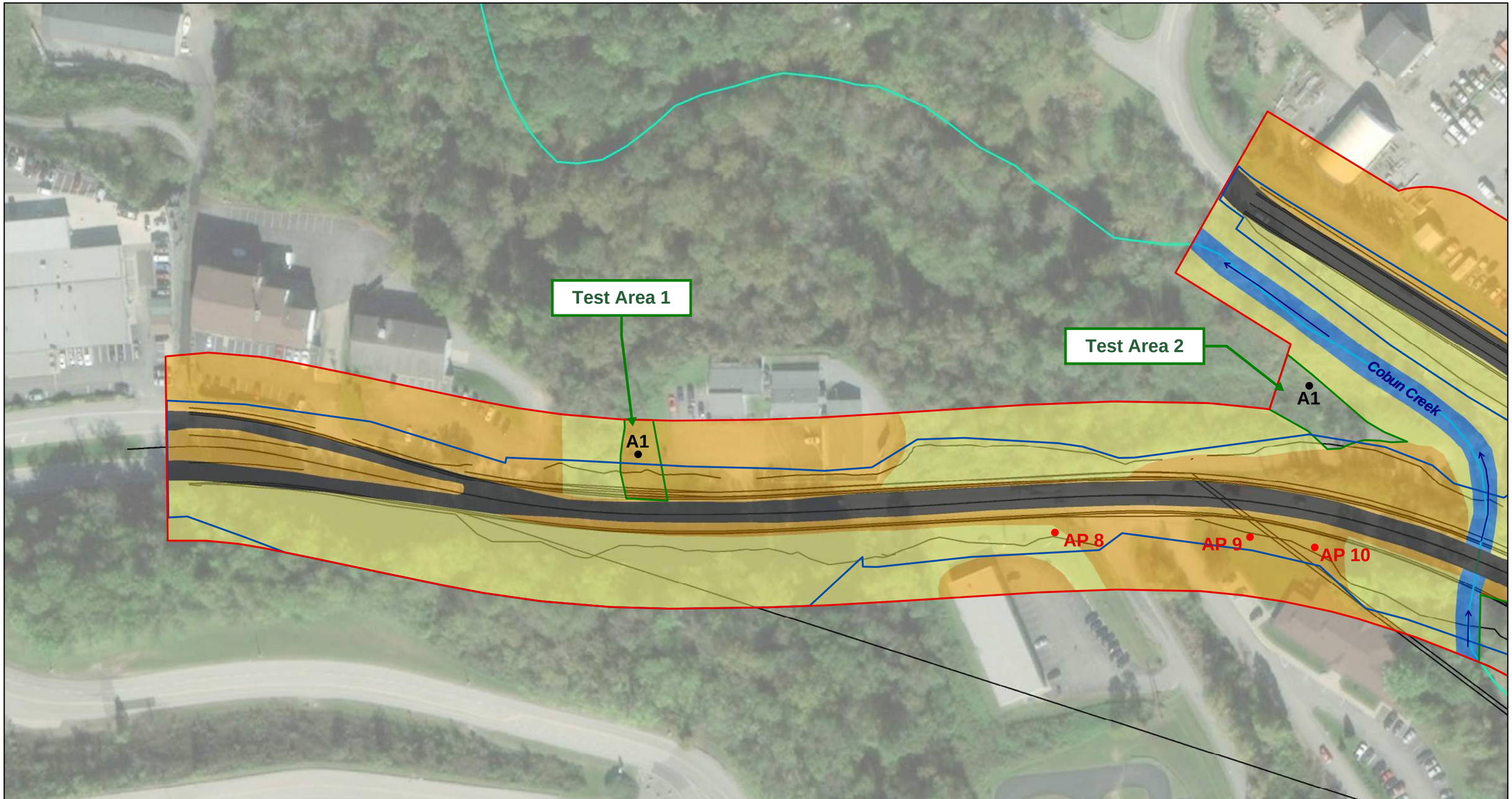
Test Area Location

Sheet Outlines

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Phase I Archaeological Survey
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Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16
Project Plan View - Sheet Locations



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Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

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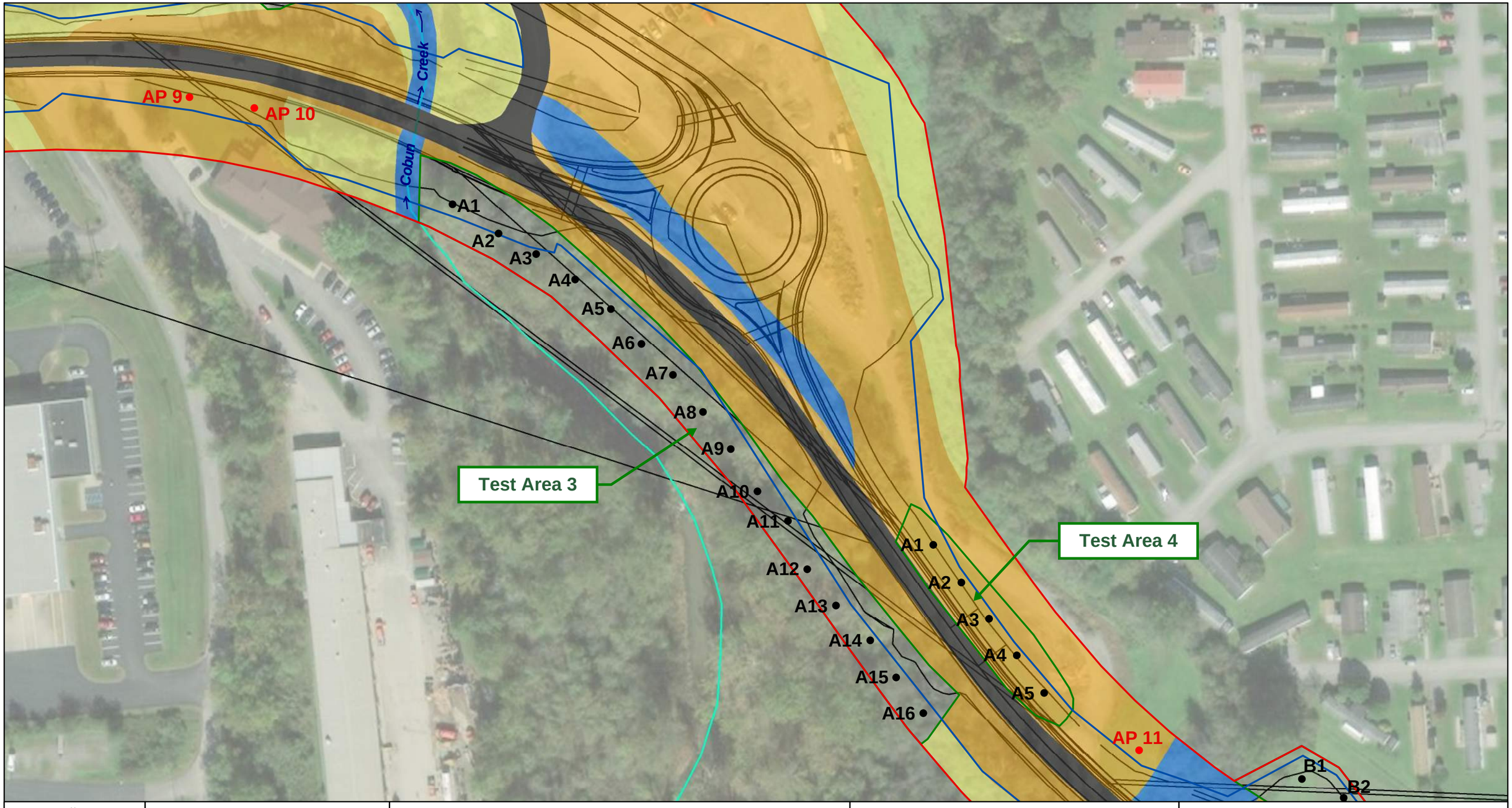
Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16

Project Plan View - Sheet 1 of 8

Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

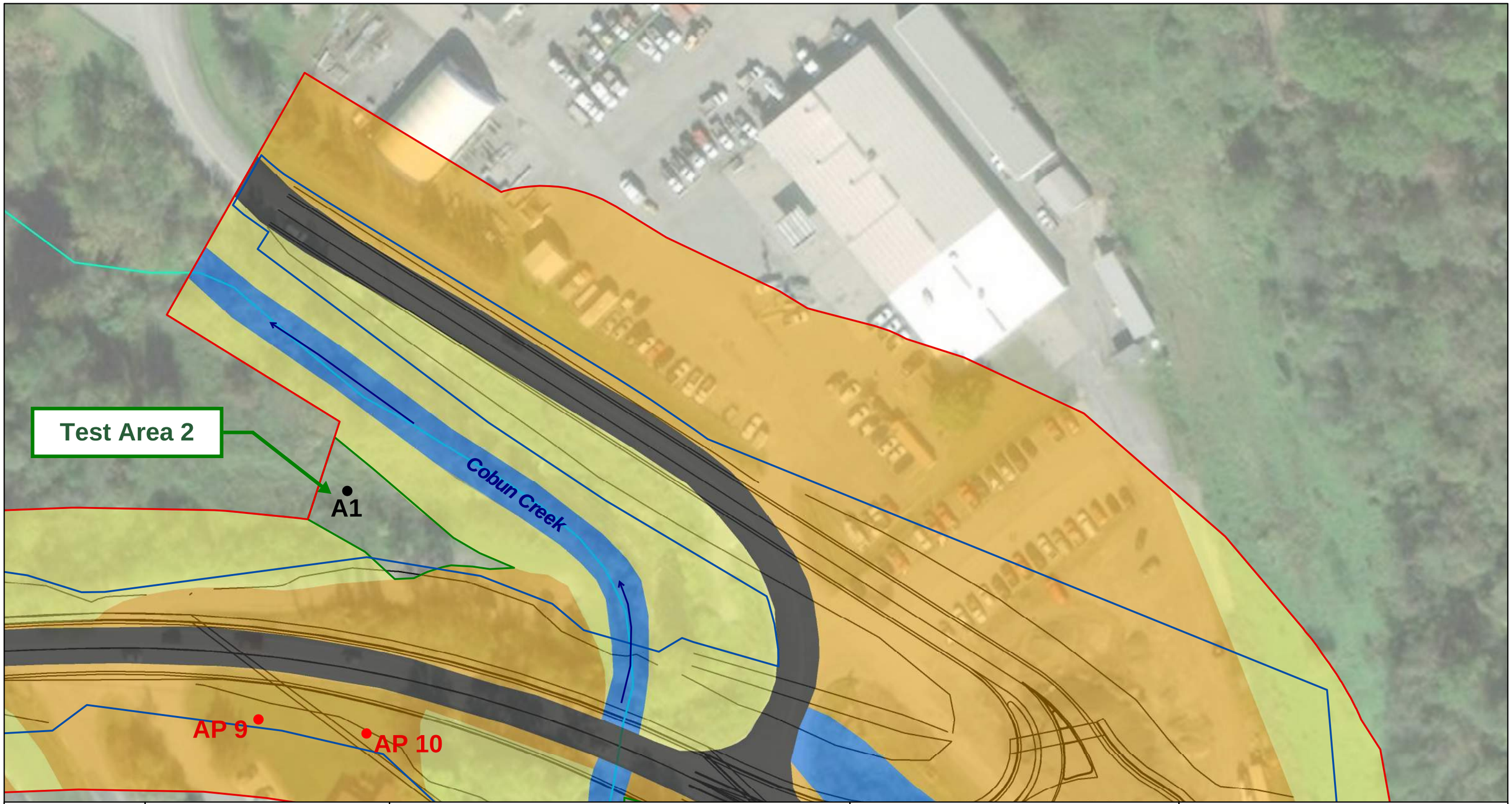
Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16

Project Plan View - Sheet 2 of 8

Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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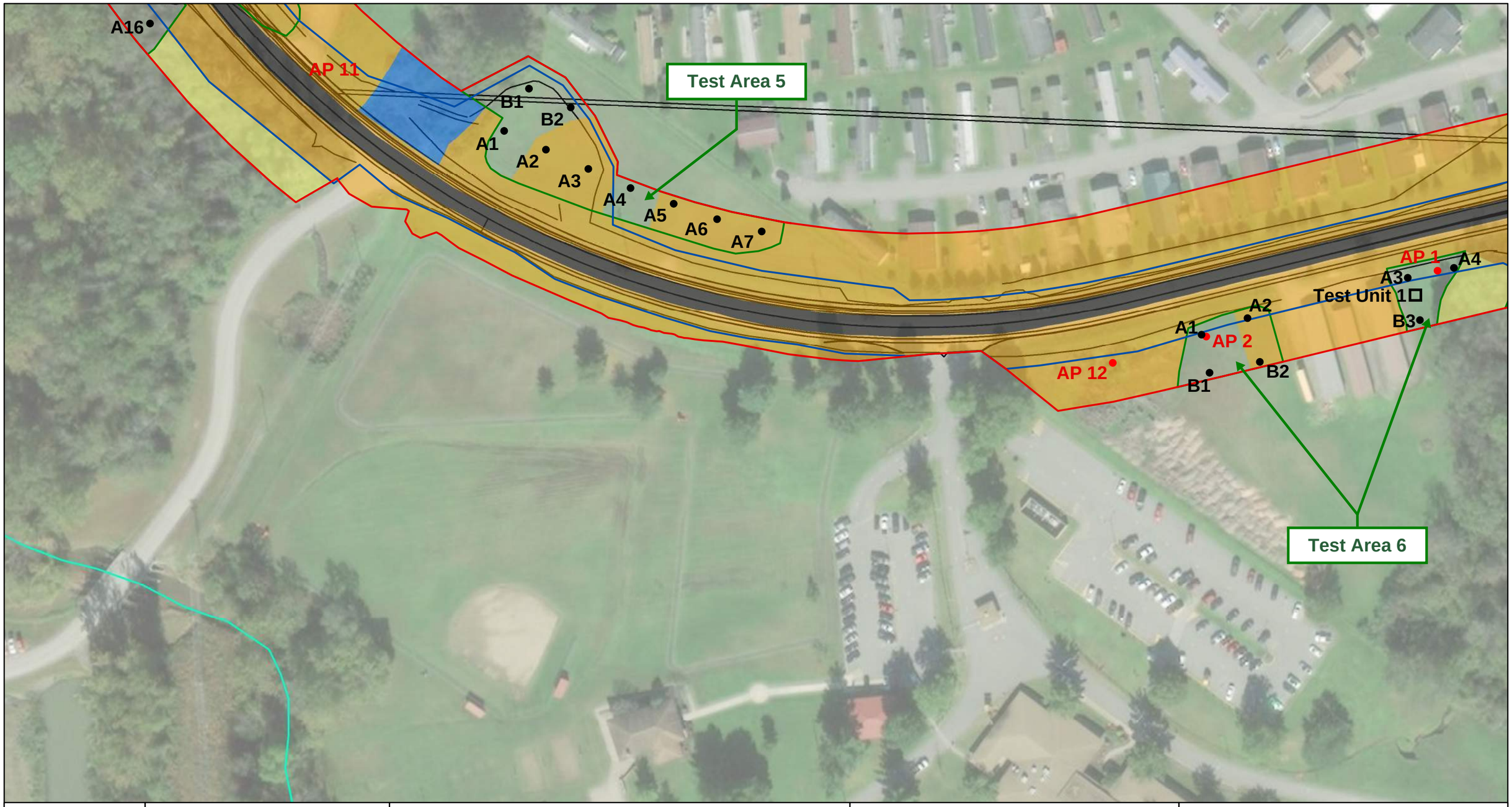
Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
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Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16
Project Plan View - Sheet 3 of 8
Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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MARKOSKY

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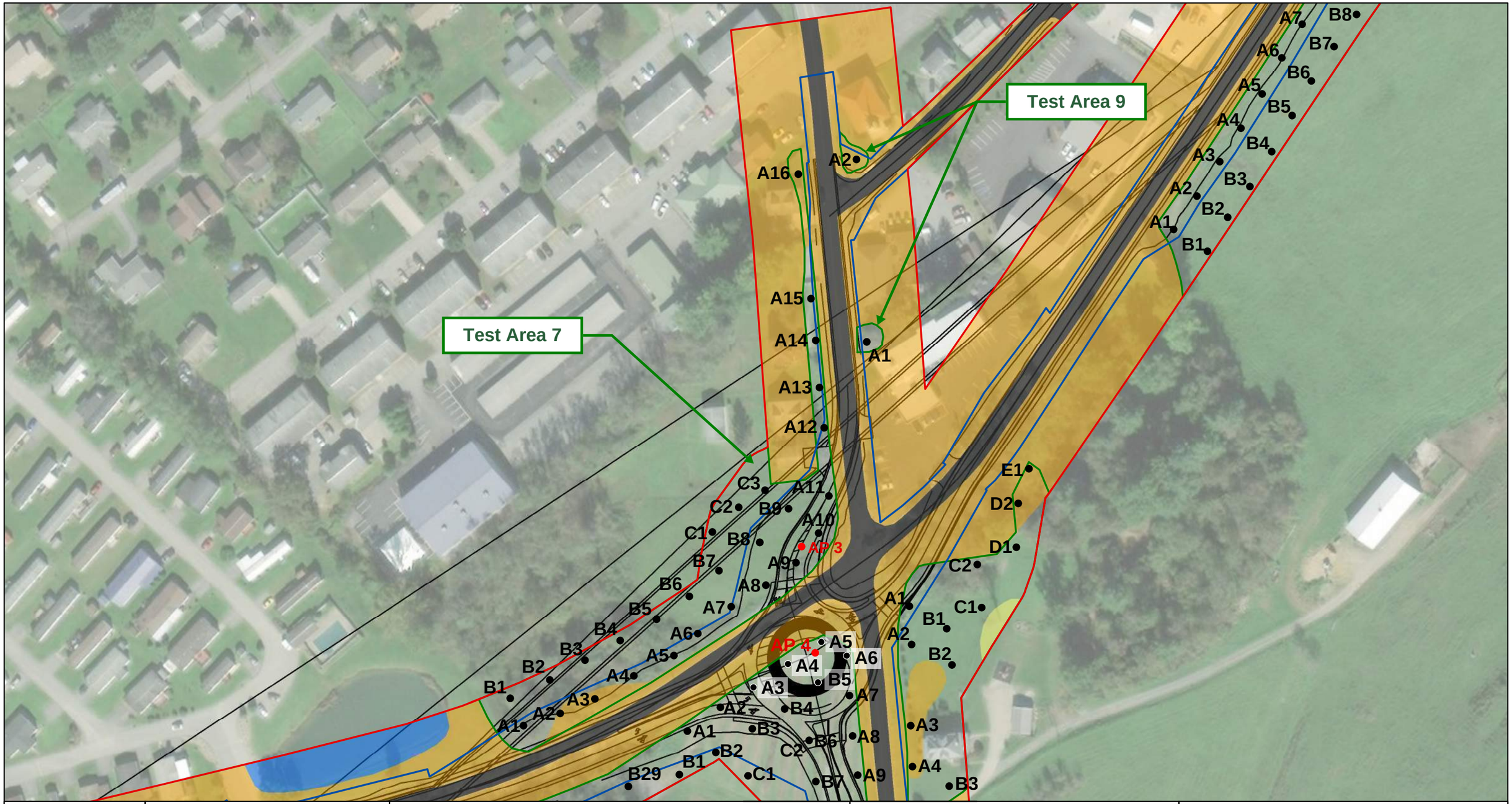
Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
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Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16
Project Plan View - Sheet 4 of 8
Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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Feet
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Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
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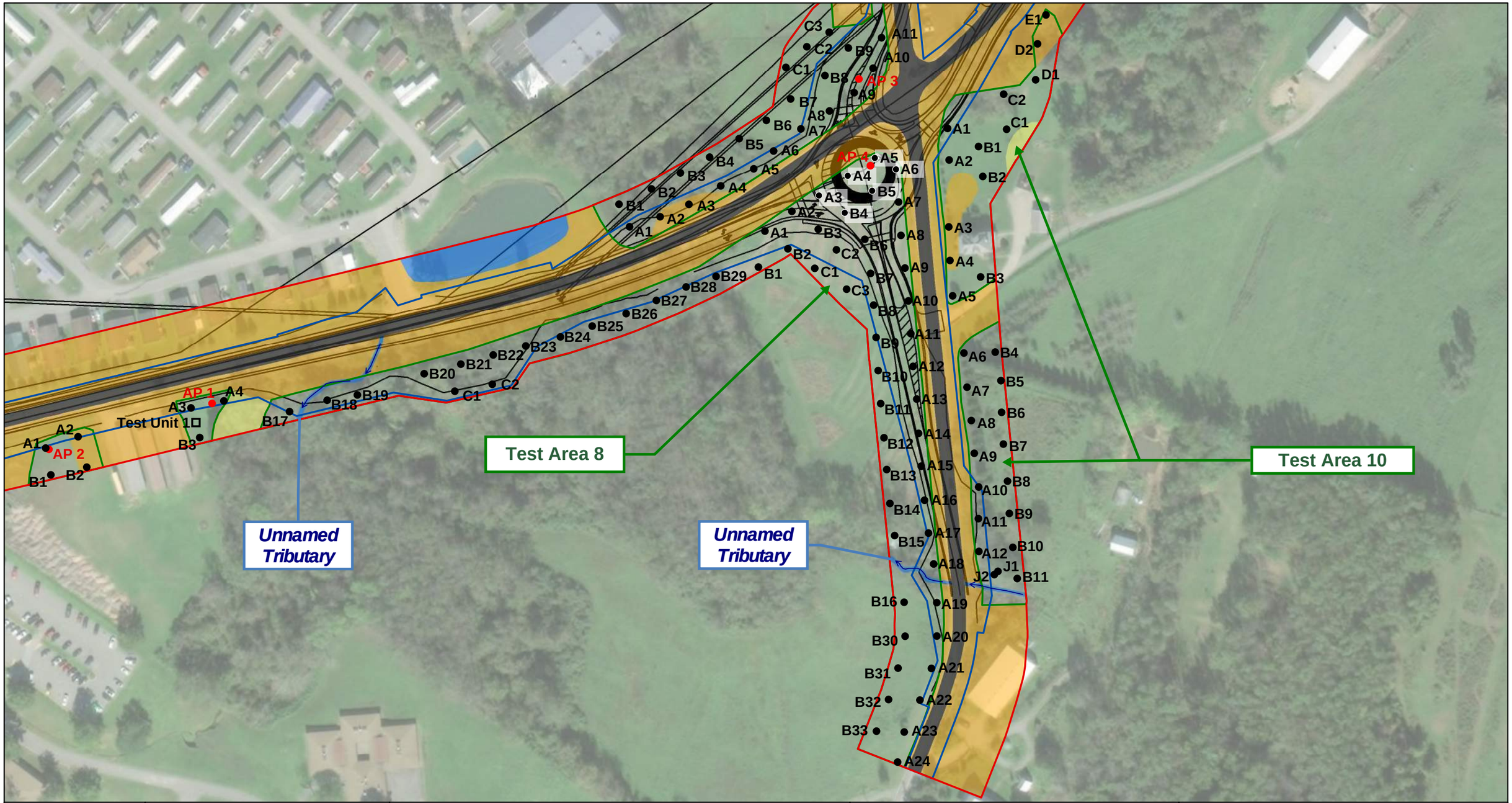
Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16

Project Plan View - Sheet 5 of 8

Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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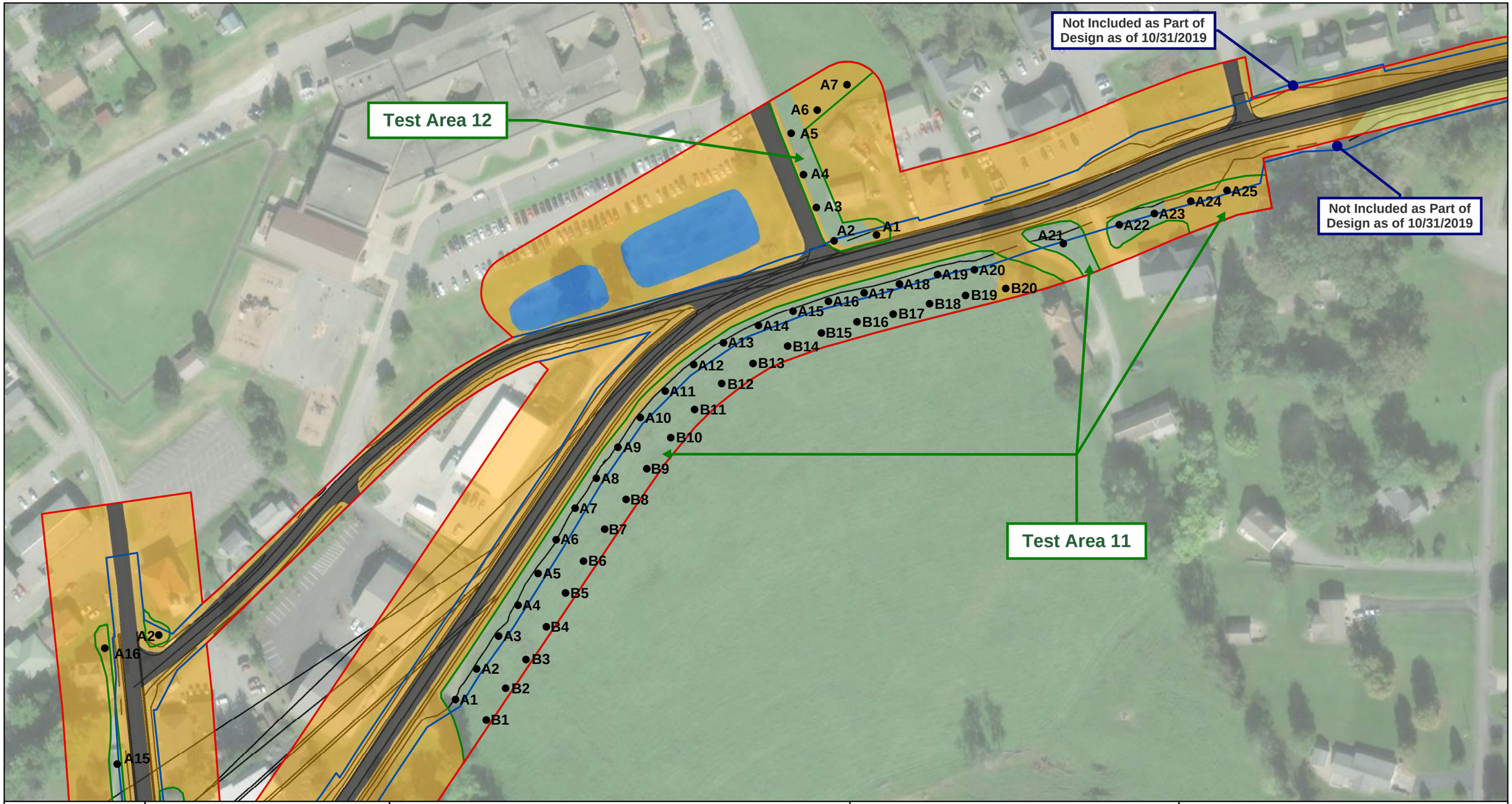
Meters
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Archaeological Study Area
APE (Preliminary Field Review Design 2019-03-29)
Simplified Design (2019-03-29)
Stream
Roadway
Disturbed
Test Area Location
Slope
Wetland
4-inch Bucket Auger Probe
STPs

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16
Project Plan View - Sheet 6 of 8
Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



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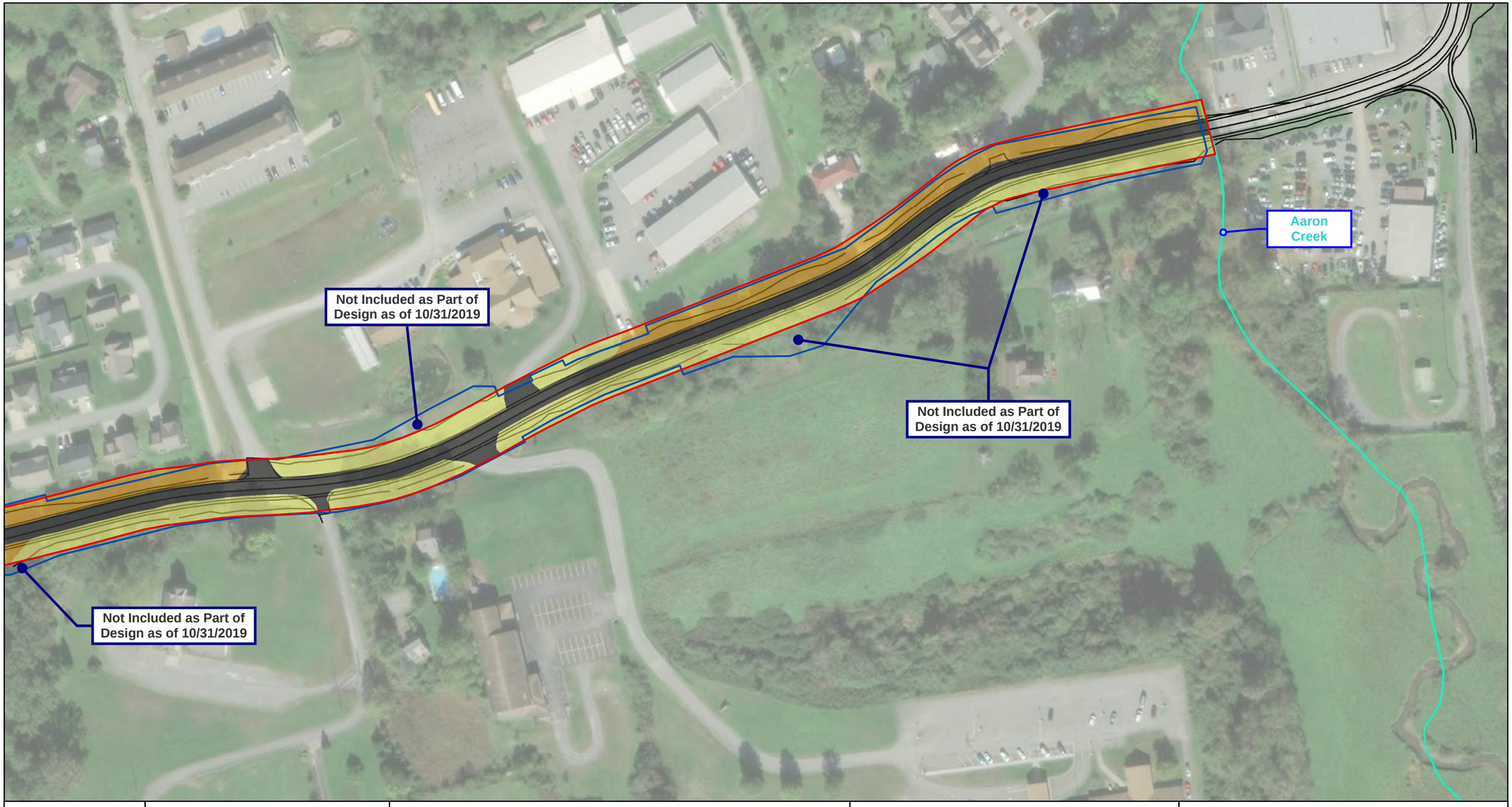
Meters
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- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia
Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16
Project Plan View - Sheet 7 of 8
Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



N
W E
S

MARKOSKY

Feet
0 50 100 150 200

Meters
0 15 30 45 60

- Archaeological Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Simplified Design (2019-03-29)
- Stream
- Roadway
- Disturbed
- Test Area Location
- Slope
- Wetland
- 4-inch Bucket Auger Probe
- STPs

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Figure 16

Project Plan View - Sheet 8 of 8

Aerial Overview Showing the Archaeological Test Areas, Disturbed, Wet, and Sloped Areas, and Roadways within the Study Area



Photograph 1. General view of the study area, facing east.



Photograph 2. General view of the study area, facing east.



Photograph 3. General view of the study area, facing east.



Photograph 4. General view of the study area, facing southeast.



Photograph 5. General view of the study area, facing east.



Photograph 6. General view of the study area, facing east.



Photograph 7. General view of the study area, facing east.



Photograph 8. General view of the study area, facing west.



Photograph 9. General view of the study area, facing east. Note disturbance from grading and a sewer line (evidenced by a manhole cover) parallel to Greenbag Road.



Photograph 10. General view of the study area, facing east.



Photograph 11. General view of the study area, facing east.



Photograph 12. General view of the study area, facing southeast.



Photograph 13. General view of the study area, facing southeast.



Photograph 14. General view of the study area, facing northwest.



Photograph 15. General view of the study area, facing southwest.



Photograph 16. General view of the study area, facing northwest.



Photograph 17. General view of the study area, facing south.



Photograph 18. General view of the study area, facing southeast.



Photograph 19. General view of the study area, facing north.



Photograph 20. General view of the study area, facing northwest.



Photograph 21. General view of steep slope and disturbance in the study area, facing south-southeast.



Photograph 22. General view of steep slope and disturbance in the study area, facing north.



Photograph 23. General view of the study area, facing northwest.



Photograph 24. General view of the study area, facing northwest.



Photograph 25. General view of the study area, facing northeast. Note that the grassy area is disturbed from grading.



Photograph 26. View of the study area in the vicinity of the Federal Correctional Institution, facing southeast.



Photograph 27. View of buried utility lines (marked by white pin flags) adjacent to Test Area 5, facing southeast.



Photograph 28. View of cut slope in the study area, facing east.



Photograph 29. View of cut slope in the study area, facing east.



Photograph 30. General view of the study area, facing east.



Photograph 31. General view of the study area east of Test Area 6, facing east.



Photograph 32. General view of the study area, facing east.



Photograph 33. General view of the study area, facing south.



Photograph 34. General view of the study area, facing northeast.



Photograph 35. General view of the study area, facing southwest.



Photograph 36. General view of the study area, facing southwest.



Photograph 37. General view of the study area, facing northeast.



Photograph 38. General view of the study area, facing southwest.



Photograph 39. General view of the study area, facing southwest.



Photograph 40. View of a drainage basin in the study area, facing southwest.



Photograph 41. General view of the study area, facing southwest.



Photograph 42. General view of the study area, facing northeast.



Photograph 43. General view of the study area, facing west.



Photograph 44. General view of the study area, facing northeast.



Photograph 45. General view of the study area, facing east.



Photograph 46. General view of the study area, facing northwest.



Photograph 47. General view of the study area, facing west.



Photograph 48. General view of the study area, facing east.



Photograph 49. General view of the study area, facing west.



Photograph 50. General view of the study area, facing east.



Photograph 51. General view of the study area, facing southwest.



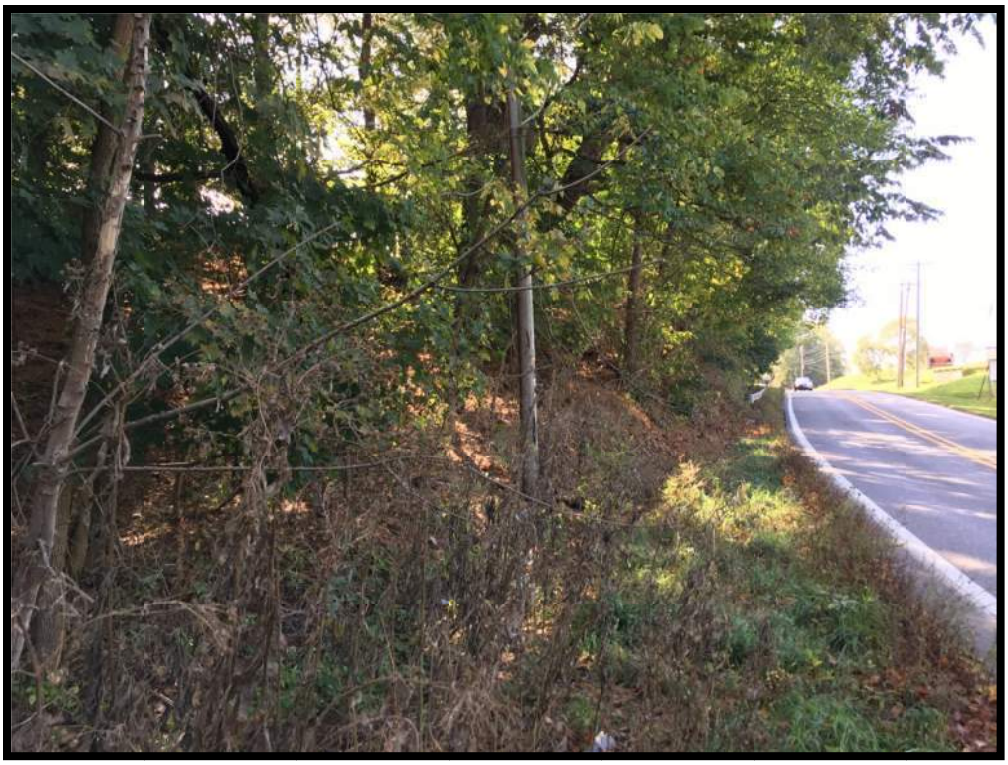
Photograph 52. General view of the study area, facing northeast.



Photograph 53. General view of the study area, facing northeast.



Photograph 54. General view of the study area, facing northeast.



Photograph 55. General view of the study area, facing southwest.



Photograph 56. General view of the study area, facing northeast.



Photograph 57. General view of the study area, facing northeast.



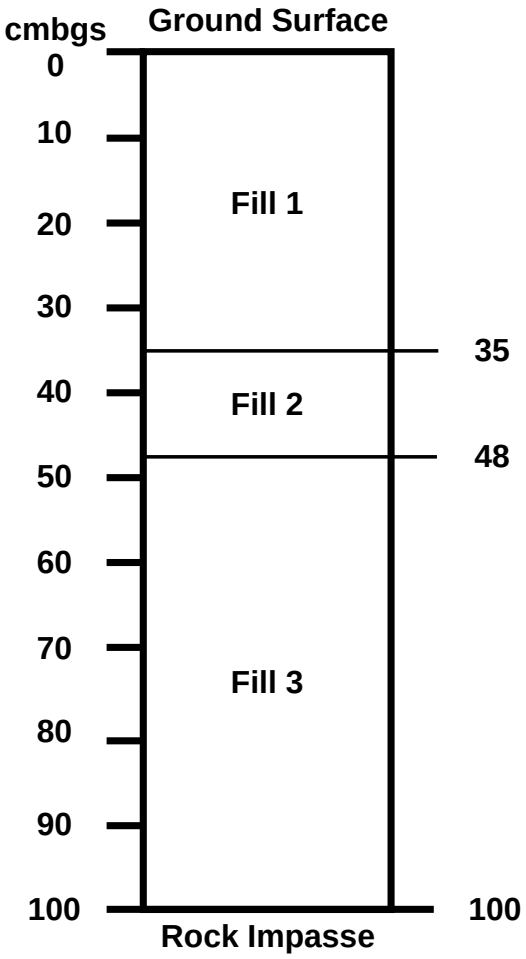
Photograph 58. General view of the study area, facing west.



Photograph 59. General view of the study area, facing southwest.



Photograph 60. View of Test Area 1, facing north.



Horizon	Description
Fill 1	10YR 4/4 Dark Yellowish Brown Silty Clay Loam with 10YR 6/8 Brownish Yellow and 10YR 5/1 Gray Mottles and Clay Pockets
Fill 2	10YR 6/2 Light Brownish Gray Sandy Clay Loam
Fill 3	2 Gley 7/1 Light Bluish Gray Channery Clay Loam with 90% Large Limestone Boulders

5.3 Test Area 2

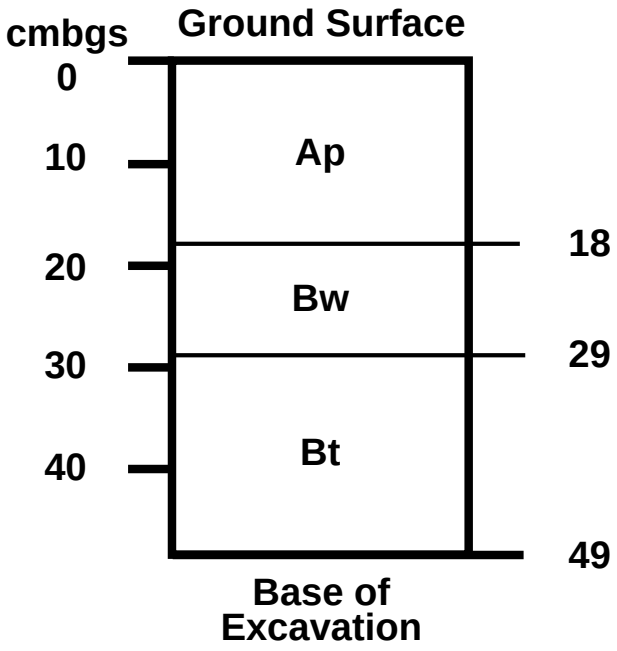
Test Area 2 is located on the north side of Greenbag Road just west of the intersection with Mississippi Street (see **Figure 16: Sheet 1 and Sheet 3**). The test area is on a stream bench landform with elevations ranging from 272.2 to 274.3 m (893.0 to 900.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a tall weeds and brush (**Photograph 61**). Soils in the test area are mapped as Clarksburg silt loam, 15 to 25 percent slopes (CkD). The test area is 0.05 ha (0.13 ac) in size. One (1) STP was excavated in Test Area 2. The soil profile consisted of Ap-Bw-Bt (**Figure 18**). No pre-contact or historic period cultural materials were identified in Test Area 2.



Photograph 61. View of Test Area 2, facing north.

5.4 Test Area 3

Test Area 3 is located on the south side of Greenbag Road opposite the intersection with Mississippi Street (see **Figure 16: Sheet 2**). The test area is on a floodplain landform along Cobun Creek with elevations ranging from 270.4 to 278.3 m (887.0 to 913.0 ft) above mean sea level. At the time of the survey, vegetation consisted of mixed hardwood trees with underbrush (**Photographs 62 and 63**). Soils in the test area are mapped primarily as Lobdell silt loam, 0 to 3 percent slopes, occasionally flooded (Lb), with Clarksburg silt loam, 15 to 25 percent slopes in the western end of the test area. The test area is 0.42 ha (1.04 ac) in size. In total, sixteen (16) STPs were excavated in Test Area 3. The soil profile varied, generally consisting of A-BA-Bw-C, AC-C-Cg, or AC-BC-Bg soil profiles. The soils reflect shifting of the stream, areas that have



Horizon	Description
Ap Horizon	10YR 5/2 Grayish Brown Silty Clay Loam
Bw Horizon	10YR 6/4 Light Yellowish Brown Silty Clay Loam
Bt Horizon	10YR 5/8 Yellowish Brown Clay Loam

been scoured, and recent alluvial deposits, as well as some pockets of older, more developed soils (**Figure 19**). No pre-contact or historic period cultural materials were identified in Test Area 3.

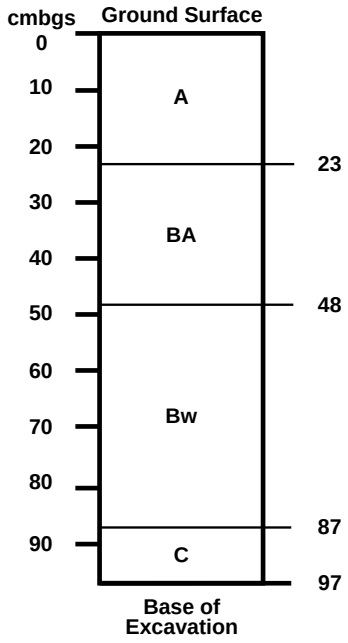


Photograph 62. View of Test Area 3, facing northwest.



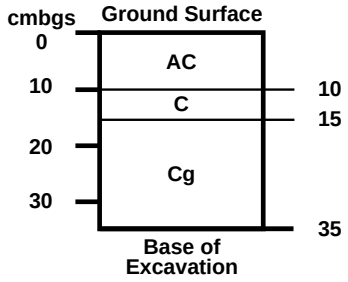
Photograph 63. View of Test Area 3, facing southeast.

STP A5



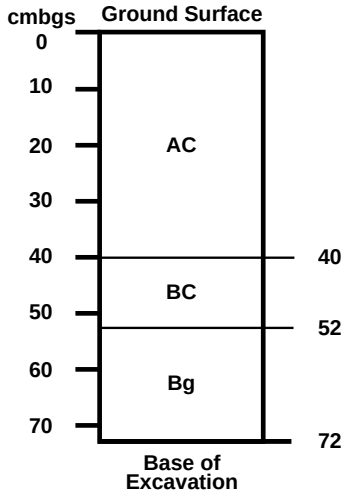
Horizon	Description
A Horizon	10YR 3/2 Very Dark Grayish Brown Silt Loam
BA Horizon	10YR 4/4 Dark Yellowish Brown Silt Loam
Bw Horizon	10YR 5/4 Yellowish Brown Sandy Loam
C Horizon	10YR 5/4 Yellowish Brown Sand

STP A7



Horizon	Description
AC Horizon	10YR 4/3 Brown Sandy Loam
C Horizon	10YR 5/4 Yellowish Brown Sand
Cg Horizon	10YR 7/2 Light Gray Sand with 10YR 5/4 Yellowish Brown Mottles

STP A11



Horizon	Description
AC Horizon	10YR 3/2 Very Dark Grayish Brown Silt Loam
BC Horizon	10YR 5/4 Yellowish Brown Sandy Silt Loam to Sandy Loam with 10YR 5/1 Gray Mottles
Bg Horizon	10YR 6/1 Gray Sandy Clay Loam to Clay Loam with 10YR 5/4 Yellowish Brown Mottles

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Figure 19
Test Area 3
STPs A5, A7, and A11
Soil Profiles

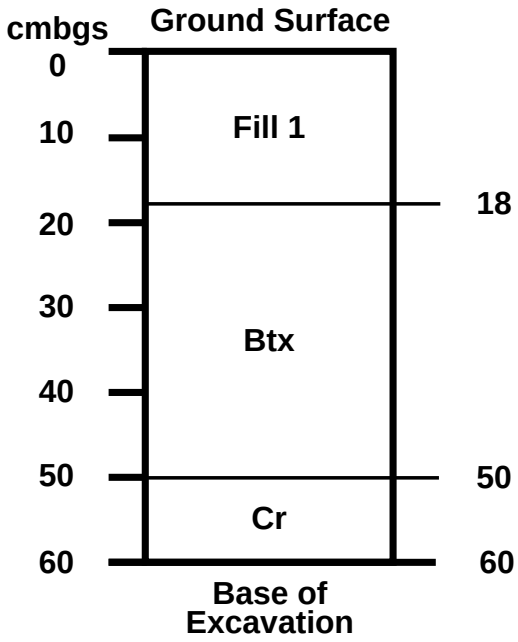
Monongalia County

5.5 Test Area 4

Test Area 4 is located on the north side of Greenbag Road, opposite Test Area 3, and south of an access road for the City of Morgantown Public Works Garage (see **Figure 16: Sheet 2**). The test area is on an upland landform with elevations ranging from 278.9 to 282.6 m (915.0 to 927.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn (**Photograph 64**). Soils in the test area are mapped as Lobdell silt loam, 0 to 3 percent slopes, occasionally flooded (Lb), but given the upland landform, are more likely to be the Clarksburg silt loam, 8 to 15 percent slopes soils, which are mapped nearby. The test area is 0.13 ha (0.32 ac) in size. In total, five (5) STPs were excavated in Test Area 4. The soil profile generally consisted of Fill 1-Btx-Cr (**Figure 20**). Excavations determined that the area was previously graded and filled. No pre-contact or historic period cultural materials of any kind were identified in Test Area 4.



Photograph 64. View of Test Area 4, facing southeast.



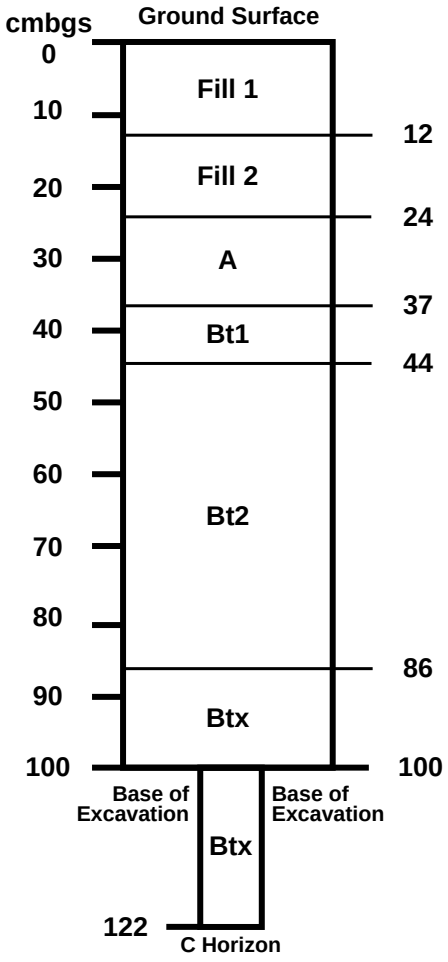
Horizon	Description
Fill 1	10YR 4/1 Dark Gray Gravelly Clay Loam with 10YR 5/8 Yellowish Brown Mottles and 20% Mechanically Crushed Gravels
Btx Horizon	10YR 5/6 Yellowish Brown Compact Sandy Clay Loam with 7.5 YR 4/2 Brown Mottles and 10% Subangular Sandstone
Cr Horizon	10YR 6/2 Light Brownish Gray Shaley Clay Loam with 7.5 YR 4/2 Brown Mottles and 40% Shale Channers

5.6 Test Area 5

Test Area 5 is located on the north side of Greenbag Road opposite a baseball field associated with the Federal Correctional Institute (see **Figure 16: Sheet 4**). The test area is on an upland landform with elevations ranging from 285.0 to 290.5 m (935.0 to 953.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn (**Photograph 65**). Soils in the test area are mapped as Clarksburg silt loam, 8 to 15 percent slopes (CkC). The test area is 0.22 ha (0.54 ac) in size. In total, nine (9) STPs were excavated in Test Area 5. The natural soil profile underlying two layers of fill consisted of A-Bt1-Bt2-Btx (**Figure 21**). Some STPs exhibited fill over the natural soils and some areas had been graded and filled. The portion of Test Area 5 that is adjacent and parallel to the existing roadway was determined to have been disturbed by buried utility lines, precluding the need for STPs in that location. No pre-contact or historic period cultural materials were identified in Test Area 5.



Photograph 65. View of Test Area 5, facing southeast. White pin flags are marking a sewer line that is parallel to Greenbag Road (right).



Horizon	Description
Fill 1	10YR 4/3 Brown Silty Clay Loam with 10YR 6/8 Brownish Yellow Mottles
Fill 2	10YR 5/2 Grayish Brown Silty Clay Loam with 10YR 4/4 Dark Yellowish Brown Mottles
A Horizon	10YR 4/3 Brown Silt Loam
Bt1 Horizon	10YR 4/6 Dark Yellowish Brown Silt Loam
Bt2 Horizon	10YR 5/6 Yellowish Brown Clay Loam
Btx Horizon	10YR 5/6 Yellowish Brown Clay Loam with Iron Manganese Nodules

MARKOSKY	Greenbag Road Improvement Phase I Archaeological Survey Abbreviated Technical Report	**Figure 21** Test Area 5 STP A1 Soil Profile	Monongalia County

5.7 Test Area 6

Test Area 6 is located on the south side of Greenbag Road at D&D Storage Facility (see **Figure 16: Sheet 4**). The test area is on hilltop and terrace landforms with elevations ranging from 287.4 to 292.0 m (943.0 to 958.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn (**Photographs 66 and 67**). Soils in the test area are mapped as Gilpin-Culleoka-Upshur silt loams, 8 to 15 percent slopes. The test area is 0.09 ha (0.23 ac) in size. In total, seven STPs were excavated in Test Area 6. The natural soil profile was different between the east and west sides of the existing storage unit facility. On the west side, the upland landform consisted of A-Bt, which closer toward the storage facility showed impacts from grading and fill (**Figure 22**). This disturbance to the A and upper Bt horizon soils was likely due to the construction of the storage units. The excavated STPs on the east side of the storage facility exhibited A-Bw-Bt profiles with fill emplaced over the natural soils (see **Figure 22**). STP A3 exhibited very thick fill deposits over intact natural soils. The STP was expanded into a test unit in this location to survey to appropriate depths. The soils in TU1 consisted of multiple fill layers over a natural profile of Ag-Bw-BC-C1-C2 (**Figure 23**), which illustrates a Late Wisconsin stream terrace above an unnamed tributary to Cobun Creek. No pre-contact or historic period cultural materials were identified in Test Area 6.

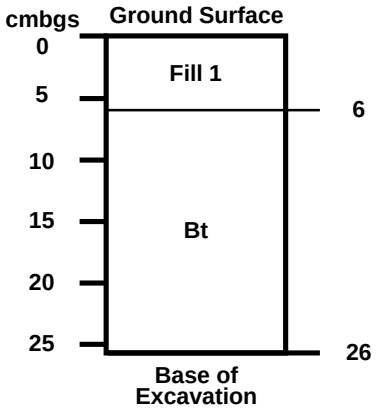


Photograph 66. View of Test Area 6, facing east.



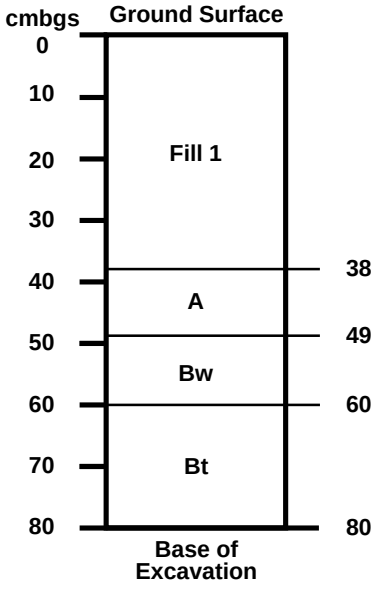
Photograph 67. View of Test Area 6, facing east.

STP A2



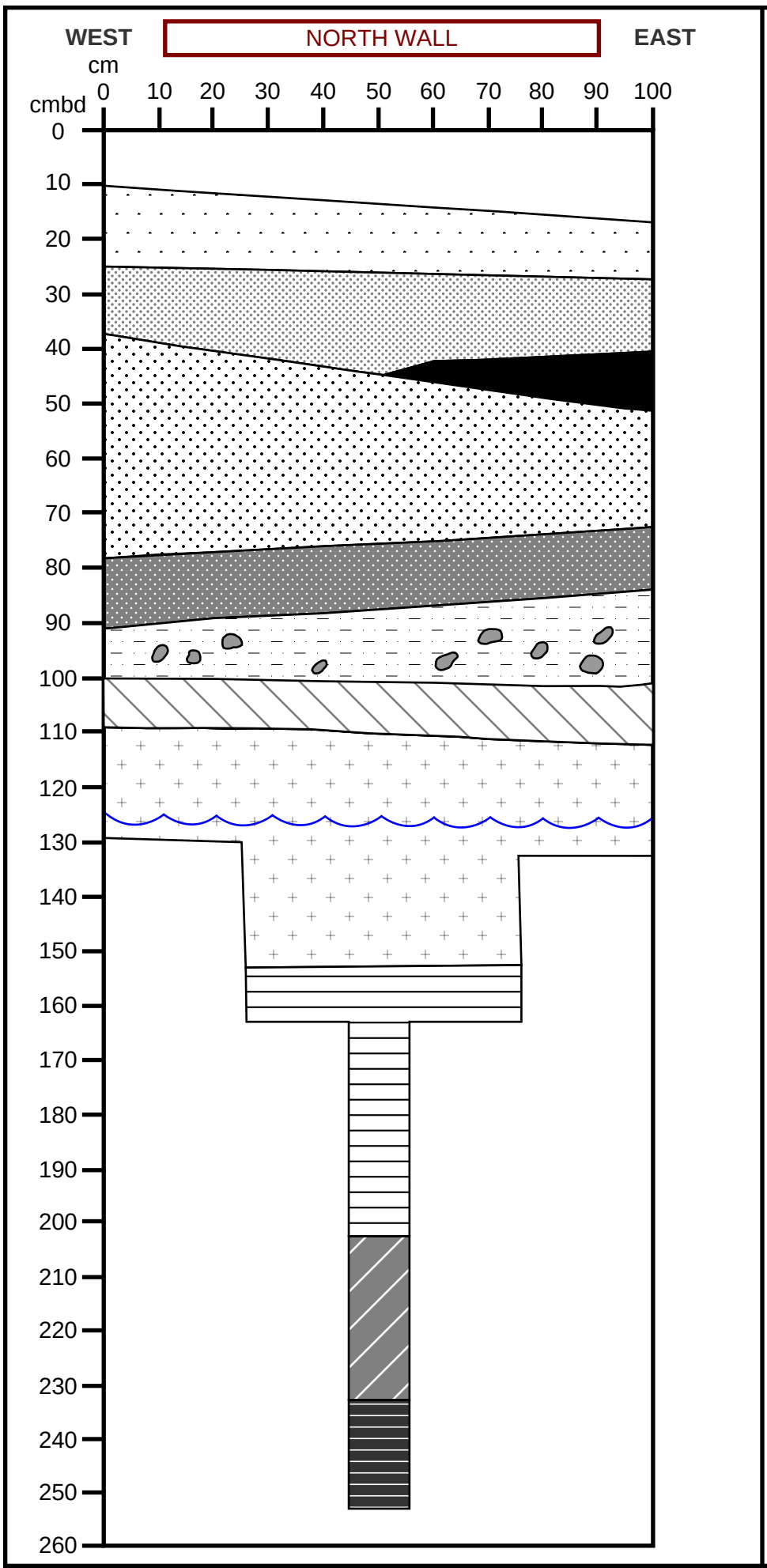
Horizon	Description
Fill 1	10YR 3/4 Dark Yellowish Brown Clay Loam
Bt Horizon	10YR 5/6 Yellowish Brown Clay Loam

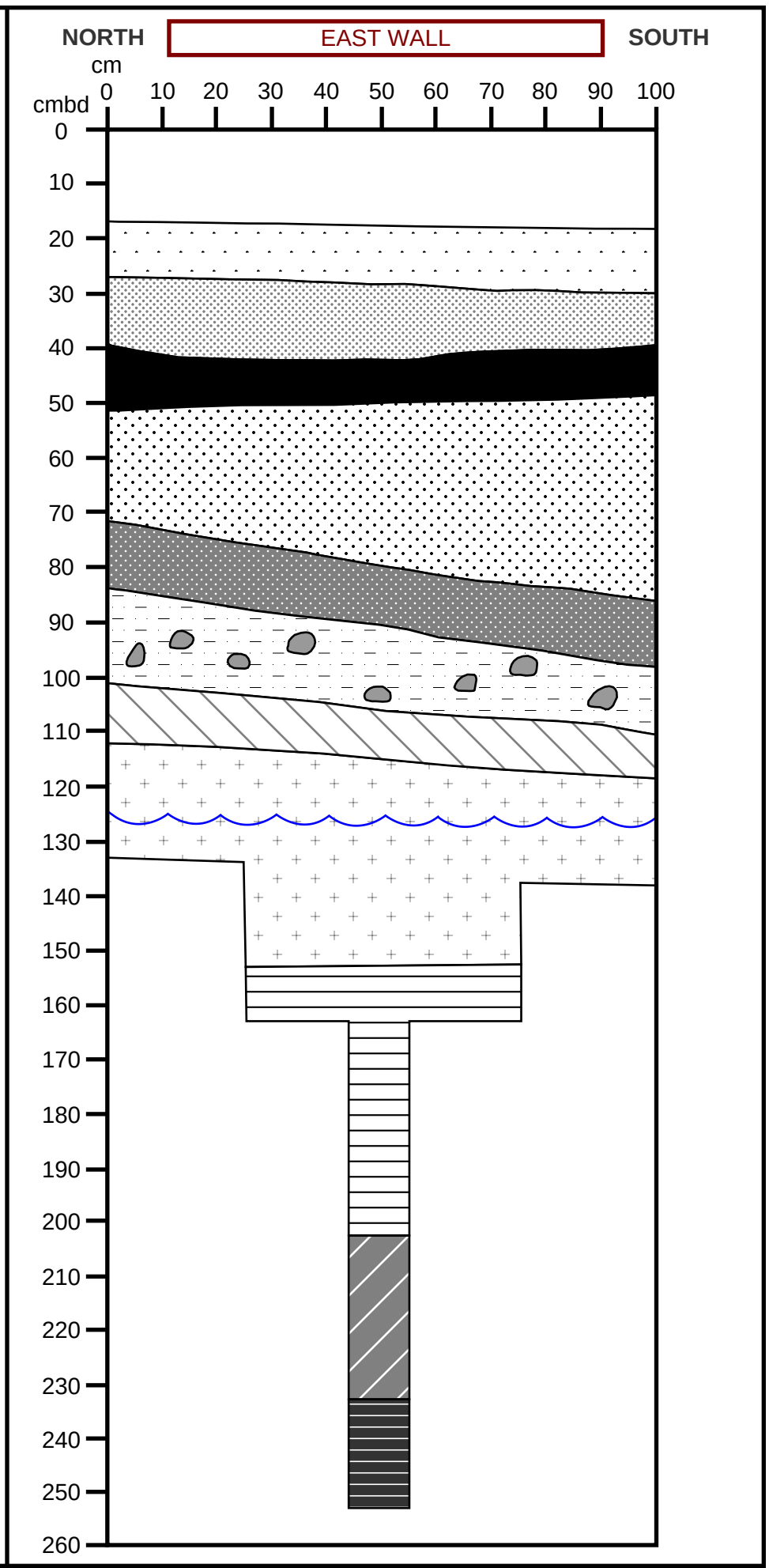
STP B3



Horizon	Description
Fill 1	10YR 4/3 Brown Silty Clay Loam with 10YR 5/2 Grayish Brown and 10YR 6/8 Brownish Yellow Mottles
A Horizon	10YR 3/2 Very Dark Grayish Brown Silt Loam
Bw Horizon	10YR 5/3 Brown Sandy Loam
Bt Horizon	10YR 6/6 Brownish Yellow Clay Loam

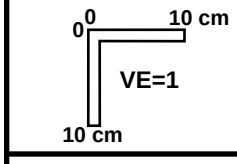
MARKOSKY	Greenbag Road Improvement Phase I Archaeological Survey Abbreviated Technical Report	**Figure 22** Test Area 6 STPs A2 and B3 Soil Profiles	Monongalia County





Fill 1	10YR 4/1 Dark Gray Clay Loam with Sparse 10YR 6/8 Brownish Yellow Mottles and Pockets of Decaying Organic Matter	**Ag Horizon**	10YR 3/2 Very Dark Grayish Brown Silt Loam with Moderate Redox
Fill 2	10YR 3/1 Very Dark Gray Silty Clay Loam with 80% Mechanically Crushed Gravels	**Bw Horizon**	10YR 5/3 Brown Sandy Loam with 10YR 5/1 Gray Mottles and Heavy Redox
Fill 3	10YR 5/2 Gray Brown Clay Loam with 10YR 6/8 Brownish Yellow Mottles and 70% Mechanically Crushed Gravels	**BC Horizon**	10YR 6/2 Light Brownish Gray Sandy Clay Loam with 10YR 5/4 Yellowish Brown Mottles and Heavy Redox
Fill 4	10YR 3/2 Very Dark Grayish Brown Silty Clay Loam with Heavy Redox and Decaying Organic Matter near Surface	**C1 Horizon**	10YR 6/1 Gray Sandy Loam to Sand with Depths and Heavy Redox
Fill 5	10YR 7/4 Clay Loam with 10YR 7/2 Light Gray and 10YR 5/1 Gray Mottles and 5% Angular Sandstone	**C2 Horizon**	10YR 6/1 Gray Channel Lag with Sand and Heavy Redox

Vertical Exaggeration



Clay Lens **Rock** **Water Table**

Datum is Located 10 cm Above Ground Surface

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Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County

Figure 23
Test Area 6
Test Unit 1
Soil Profiles

5.8 Test Area 7

Test Area 7 is located in the northwest quadrant of the intersection of Greenbag Road with Dorsey Avenue (see **Figure 16: Sheet 5**). The test area is on a hillslope landform with elevations ranging from 290.5 to 299.9 m (953.0 to 984.0 ft) above mean sea level. At the time of the survey, vegetation was variable and consisted of a wooded area with dense underbrush, an area with grasses and weeds; and maintained grassy lawns (**Photographs 68-72**). Soils in the test area are mapped along Greenbag Road as Clarksburg silt loam, 8 to 15 percent slopes (CkC) and along Dorsey Avenue as Zoar silt loam, 3 to 8 percent slopes (ZoB). The test area is 0.50 ha (1.24 ac) in size. In total, twenty-eight (28) STPs were excavated in Test Area 7. The soil profile typically consisted of A-Bt or Ap-Bw-Bg (**Figure 24**). Some STPs revealed disturbed soils or fill layers over natural soils. No pre-contact or historic period cultural materials were identified in Test Area 7.



Photograph 68. View of Test Area 7, facing northeast.



Photograph 69. View of Test Area 7, facing northeast.



Photograph 70. View of Test Area 7, facing north.

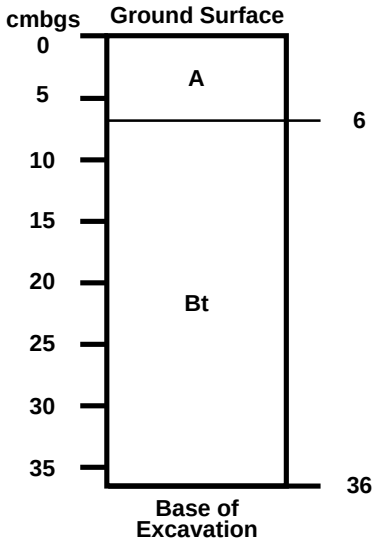


Photograph 71. View of Test Area 7, facing north.



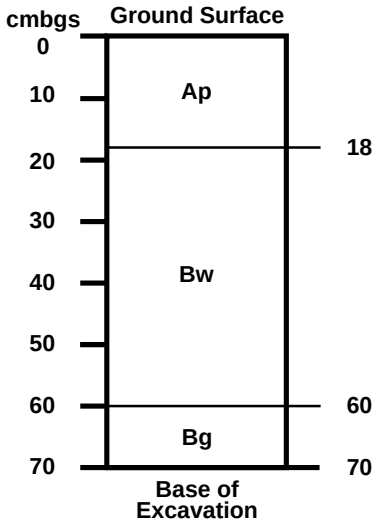
Photograph 72. View of Test Area 7, facing north.

STP A5



Horizon	Description
A Horizon	7.5YR 5/2 Brown Silt Loam
Bt Horizon	7.5YR 5/6 Strong Brown Silty Clay Loam to Clay Loam with Depth

STP B8



Horizon	Description
Ap Horizon	10YR 4/1 Dark Gray Silty Clay Loam with Minor Redox
Bw Horizon	10YR 6/3 Pale Brown Silty Loam with Heavy Manganese Staining
Bg Horizon	10YR 7/2 Light Gray Clay

MARKOSKY	Greenbag Road Improvement Phase I Archaeological Survey Abbreviated Technical Report	**Figure 24** Test Area 7 STPs A5 and B8 Soil Profiles	Monongalia County

5.9 Test Area 8

Test Area 8 is located in the southwest quadrant of the intersection of Greenbag Road with Kingwood Pike (see **Figure 16: Sheet 6**). The test area is on a hillslope landform with elevations ranging from 291 to 293 m (927.0 to 1,025.0 ft) above mean sea level. At the time of the survey, vegetation consisted of forested areas with dense underbrush and grassy fields (**Photographs 73-80**). Soils in the test area are mapped as Clarksburg silt loam, 8 to 15 percent slopes (CkC) and 15 to 25 percent slopes (CkD) although all test locations were less than 20 percent slope. The test area is 1.21 ha (2.98 ac) in size. In total, sixty-two (62) STPs were excavated in Test Area 8. The soil profile generally consisted of Ap-Bw-Bt, except at two locations in the test area where an unnamed tributary passes through. At the western extent of the test area in vicinity of the tributary, the soils consist of A-C1-C2 and in the southern extent of the test area in the vicinity of the tributary, the soils consist of AC-BC-C-Cg (**Figure 25**). No pre-contact or historic period cultural materials were identified in Test Area 8.



Photograph 73. View of Test Area 8, facing east.



Photograph 74. View of Test Area 8, facing west.



Photograph 75. View of Test Area 8, facing west.



Photograph 76. View of Test Area 8, facing northeast.



Photograph 77. View of Test Area 8, facing south.



Photograph 78. View of Test Area 8, facing south.

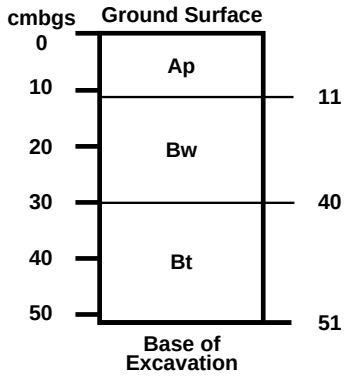


Photograph 79. View of an unnamed tributary at the southern end of Test Area 8, facing west.



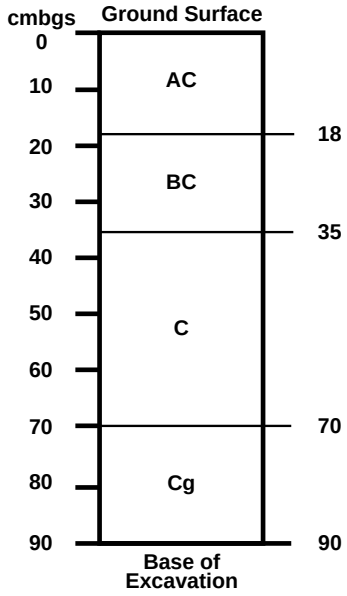
Photograph 80. View of Test Area 8 from the southern terminus, facing northeast.

STP A7



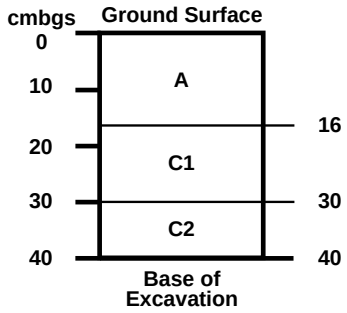
Horizon	Description
Ap Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
Bw Horizon	10YR 5/6 Yellowish Brown Silt Loam
Bt Horizon	10YR 6/6 Brownish Yellow Silty Clay Loam

STP A18



Horizon	Description
AC Horizon	10YR 4/3 Brown Sandy Loam
BC Horizon	10YR 6/3 Pale Brown Sandy Loam
C Horizon	7.5YR 5/8 Strong Brown Sand
Cg Horizon	10YR 6/2 Light Brownish Gray Sand with 7.5YR 5/8 Strong Brown Mottles

STP B18



Horizon	Description
A Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
C1 Horizon	10YR 6/2 Light Brownish Gray Sandy Loam with 10YR 4/1 Dark Gray Mottles
C2 Horizon	10YR 5/6 Yellowish Brown Sand with 10YR 7/1 Light Gray Mottles

5.10 Test Area 9

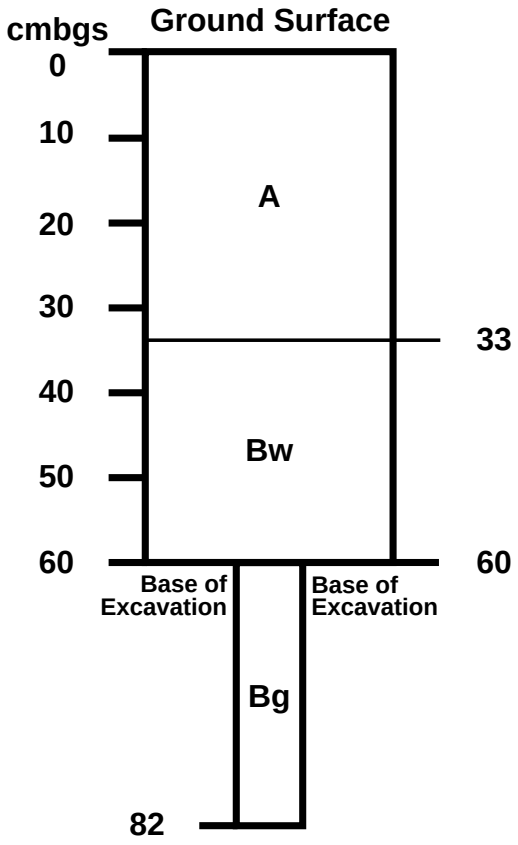
Test Area 9 is located in the northeast quadrant of the intersection of Greenbag Road with Dorsey Avenue (see **Figure 16: Sheet 5**). The test area is on a hillslope landform with elevations ranging from 293.2 to 297.8 m (962.0 to 977.0 ft) above mean sea level. At the time of the survey, vegetation consisted of maintained grassy lawns (**Photographs 81 and 82**). Soils in the test area are mapped as Zoar silt loam, 3 to 8 percent slopes (ZoB). The test area is 0.02 ha (0.05 ac) in size. Two (2) STPs were excavated in Test Area 9. The soil profile consisted of A-Bw-Bg in STP 9A1 (**Figure 26**). STP 9A2 exhibited disturbance from grading and fill. No pre-contact or historic period cultural materials were identified in Test Area 9.



Photograph 81. View of Test Area 9, facing south.



Photograph 82. View of Test Area 9, facing northeast.



Horizon	Description
A Horizon	10YR 4/1 Dark Gray Silty Loam
Bw Horizon	10YR 5/6 Yellowish Brown Silty Loam
Bg Horizon	10YR 7/1 Light Gray Clay Loam Mixed with 10YR 5/6 Yellowish Brown

5.11 Test Area 10

Test Area 10 is located in the southeast quadrant of the intersection of Greenbag Road and Kingwood Pike (see **Figure 16: Sheet 6**). The test area is on a hillslope landform with elevations ranging from 302.4 to 319.1 m (992.0 to 1,047.0 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn; grassy meadows; and some mature, planted trees (**Photographs 83-87**). Soils in the test area are mapped as Clarksburg silt loam, 8 to 15 percent slopes (CkC) and 15 to 25 percent slopes (CkD). The test area is 0.58 ha (1.44 ac) in size. In total, 30 STPs were excavated in Test Area 10 in areas with less than 20 percent slope. The soil profiles consisted of A-Bw-Bt-Cr and A-Bt-Cr (**Figure 27**). No pre-contact or historic period cultural materials were identified in Test Area 10.



Photograph 83. View of Test Area 10, facing south.



Photograph 84. View of Test Area 10, facing north.



Photograph 85. View of Test Area 10, facing north.

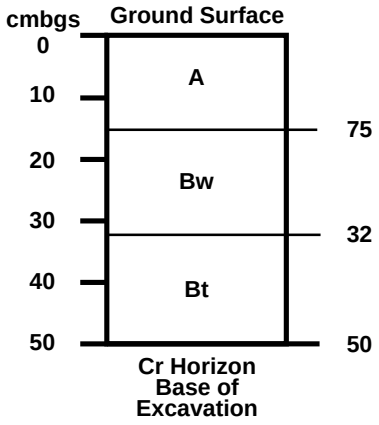


Photograph 86. View of Test Area 10, facing northwest.



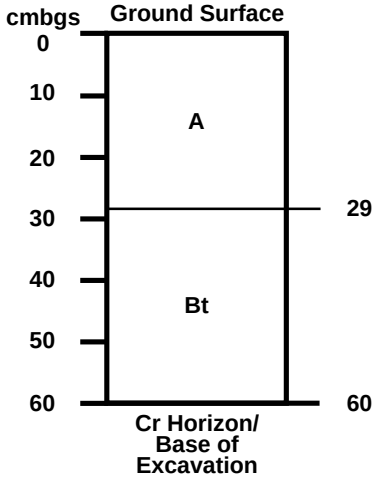
Photograph 87. View of Test Area 10, facing south.

STP A2



Horizon	Description
A Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
Bw Horizon	10YR 5/6 Yellowish Brown Silt Loam with 25% Subangular Sandstone
Bt Horizon	10YR 6/6 Brownish Yellow Silty Clay Loam with 25% Subangular Sandstone

STP A8



Horizon	Description
A Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
Bt Horizon	10YR 6/6 Brownish Yellow Silty Clay Loam

MARKOSKY	Greenbag Road Improvement Phase I Archaeological Survey Abbreviated Technical Report	**Figure 27** Test Area 10 STPs A2 and A8 Soil Profiles	Monongalia County

5.12 Test Area 11

Test Area 11 is located on the south side of Greenbag Road at the eastern extent of the study area (see **Figure 16: Sheet 7**). The test area is on hillslope landform with elevations ranging from 289.3 to 307.2 m (949.0 to 1,008.0 ft) above mean sea level. At the time of the survey, vegetation consisted of maintained grassy lawns, a hay field, and a cow pasture (**Photographs 88-93**). Soils in the test area are mapped as Clarksburg silt loam, 8 to 15 percent slopes (CkC). The test area is 0.85 ha (2.06 ac) in size. In total, forty-five (45) STPs were excavated in Test Area 11. The soil profile consisted of Ap-Bt (**Figure 28**). The eastern extent of the test area, which consisted of residential yards, exhibited grading and fill activities likely associated with leveling the yards and construction of driveways. No pre-contact or historic period cultural materials were identified in Test Area 11.



Photograph 88. View of Test Area 11, facing northeast.



Photograph 89. View of Test Area 11, facing southwest.



Photograph 90. View of Test Area 11, facing northeast.



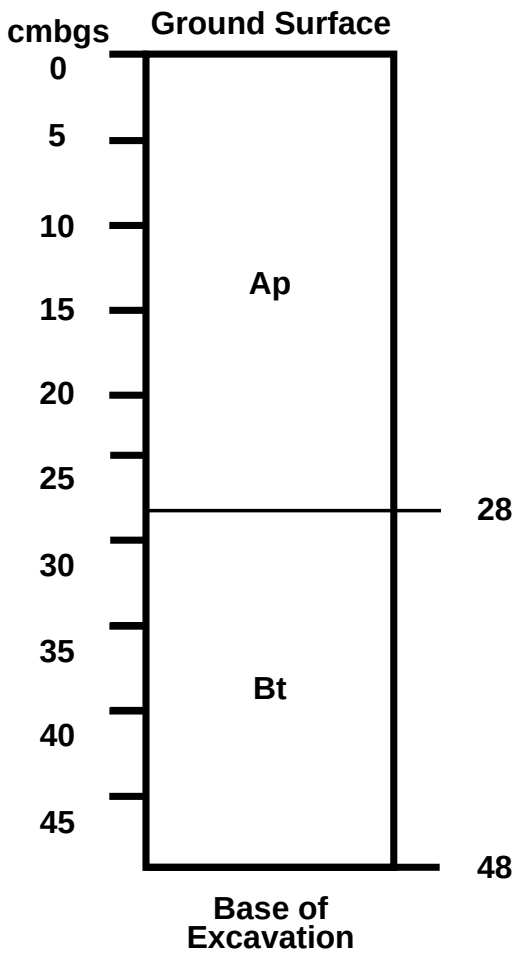
Photograph 91. View of Test Area 11, facing east.



Photograph 92. View of Test Area 11, facing east-northeast.



Photograph 93. View of Test Area 11, facing west-southwest.



Horizon	Description
Ap Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
Bt Horizon	10YR 5/6 Yellowish Brown Silty Clay Loam

5.13 Test Area 12

Test Area 12 is located on the north side of Greenbag Road east of Richard Avenue (see **Figure 16: Sheet 7**). The test area is on a high terrace landform with elevations ranging from 295.7 to 296.9 m (970 to 974 ft) above mean sea level. At the time of the survey, vegetation consisted of a maintained grassy lawn (**Photographs 94-96**). Soils in the test area are mapped as Zoar silt loam, 3 to 8 percent slopes (ZoB). The test area is 0.12 ha (0.31 ac) in size. In total, seven (7) STPs were excavated in Test Area 12. The soil profile consisted of A-Bt (**Figure 29**). The southeastern-most STP exhibited disturbance from grading and fill. No pre-contact or historic period cultural materials were identified in Test Area 12.



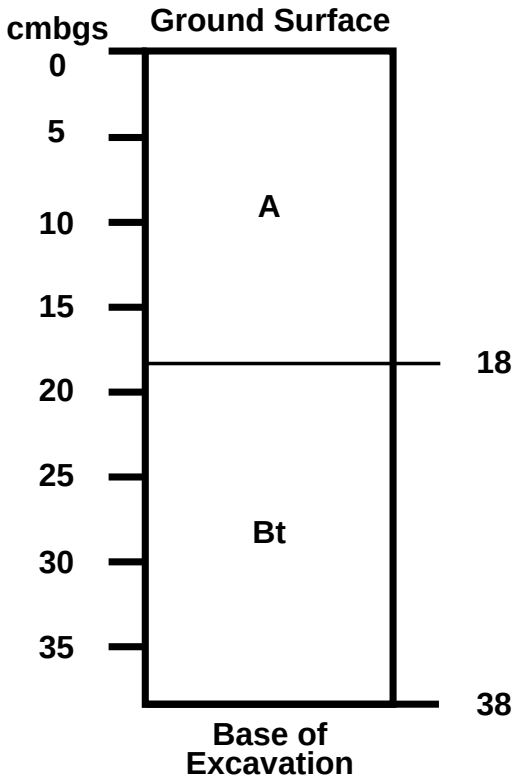
Photograph 94. View of Test Area 12, facing west.



Photograph 95. View of Test Area 12, facing northwest.



Photograph 96. View of Test Area 12, facing northeast.



Horizon	Description
A Horizon	10YR 4/2 Dark Grayish Brown Silt Loam
Bt Horizon	10YR 5/6 Yellowish Brown Silty Clay Loam

6.0 SUMMARY AND RECOMMENDATIONS

Markosky conducted a Phase I archaeological survey within the study area for the Greenbag Road Improvement project in the City of Morgantown, Monongalia County, West Virginia. The Phase I survey consisted of background research, field investigations, and the preparation of this report. The fieldwork was conducted between January 28 and March 21, 2019 and on October 8, 2019. Because project design and frequent revisions to design was in progress during most of the Phase I archaeology fieldwork, an archaeological Area of Potential Effects (APE) was not initially able to be established for the project; therefore, a study area was delineated, that attempted to capture all permanent impacts and temporary work spaces needed during construction. The Phase I efforts were designed and conducted to determine if any potentially significant archaeological resources are present within the established study area. Prior to the completion of this report, a preliminary APE for the project was established based on Preliminary Field Review Design from 3/29/2019. This report shows the results of the Phase I survey within the larger study area, as well as the preliminary APE.

The study area totals 19.96 ha (49.33 ac) in size, of which 13.23 ha (32.70 ac) are disturbed, 2.40 ha (5.93 ac) are steeply sloped, 0.71 ha (1.76 ac) are in stream beds or small drainages, and 3.62 ha (8.94 ac) contained intact soils. In total, two hundred thirteen (213) STPs and one (1) TU were excavated within twelve (12) total test areas. Additionally, twelve (12) 4-in bucket auger probes and numerous split spoon auger borings were excavated to verify and delineate areas of disturbance. No pre-contact or historic period archaeological resources were identified. No previously recorded archaeological sites are present within the study area, or within the APE based on design from 3/29/2019. The project as currently designed will not impact any archaeological sites eligible for or listed on the NRHP.

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APPENDIX A

Resumes of Key Personnel

EXPERIENCE

Ms. Schumer is a Senior Archaeologist / Principal Investigator with 17 years of experience in the fields of Archaeology and Cultural Resources. Jessica has been in charge of supervising prehistoric and historic archaeological investigations and acts as the project manager on various projects. Previous experience includes preparing proposals, budgets, and schedules; conducting fieldwork, laboratory analysis, and curation; managing personnel and logistics; preparing reports, products, and presentations; conducting technical peer review; ensuring internal and external QA/QC; and facilitating client and agency communications and coordination. Jessica has conducted archaeological projects in Pennsylvania, West Virginia, Ohio, Maryland, Delaware, Massachusetts, New York, and Peru.

Select Project Experience

SR 0119, Section 463, Home Bridge No. 3, Indiana County, PA – PennDOT District 10-0
Project Manager
Ms. Schumer oversaw the completion of the Phase I and II archaeological surveys for this bridge replacement project, and is currently overseeing the Phase III data recovery. She is also coordinating with the District, is coordinating the public education and involvement of archaeological and historic resources, and is overseeing a statewide publication that will be distributed to the public as a component of the required mitigation.

SR 0281, Section 023, Gilmore to Welsh Hill Road, Somerset County, PA – PennDOT District 9-0
Principal Investigator
This project involves road improvements to a 9-mile long section of SR 0281 in Somerset County. Markosky conducted geophysical investigations in areas with potential for unmarked burials, Phase I archaeological survey, Phase II excavations of a 19th and 20th century domestic site, burial removal excavations, and monitoring during construction.

SR 0913, Section 02B, Roaring Run Bridge, Fulton County, PA – PennDOT District 9-0
Principal Investigator
The proposed project replaces the SR 0913 structure over Roaring Run adjacent to Sideling Hill Creek in an area with a high probability for archaeological resources. Markosky conducted a Phase IA reconnaissance survey that included both a geophysical survey that identified the locations of subsurface historic resource anomalies, as well as a geomorphological survey that identified potential locations of pre-contact resources. A Phase IB archaeological survey was conducted that identified two archaeological sites, both of which were recommended as not eligible for the NRHP.

SR 0119, Section 464, Pollock Bridge, Indiana County, PA – PennDOT District 10-0
Principal Investigator
The proposed project replaces the SR 0119 structure over an unnamed tributary in an area with a moderate to high probability for pre-contact resources. Markosky conducted a Phase I archaeological survey and provided abbreviated report with negative findings for agency review.

Previous Project Experience

New Cumberland, West Virginia 2, Hancock County, WV – WVDOH
Principal Investigator
Phase IA Geomorphology and Archaeological Constraints. Report prepared for the West Virginia Division of Highways.

U.S. 35 Improvements, Additional 14 Mile Survey, Putnam and Mason Counties, WV – WVDOH
Principal Investigator
Phase I and II Archaeology. State Project # U220-35-0.02 02, Federal Project #CM-0035(107). Report prepared for the West Virginia Division of Highways.

Jessica L. S. Schumer, M.A., RPA

Archaeology Group Leader, Senior Archaeologist

EDUCATION

M.A. Archaeology
University of Pittsburgh, 2008

B.A. Archaeology
Pennsylvania State University, 2001

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2015 (35100174)

Historic Archaeologist-Specialization in Historic Ceramic and Glass Manufacturing Technologies

MEMBERSHIPS

West Virginia Archaeological Society

Council for West Virginia Archaeology

TRAINING

Section 106 in the New Regulatory Environment

Section 4(f)

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DD SRA Harper Storage Yard, Hardy County, WV – WVDOH
Principal Investigator
Phase I and II Archaeological Investigations at the Harper Site (46HY366/641), State Project #X316-SBV/RR-40.60. Report prepared for the West Virginia Division of Highways.

Buffalo Creek Connector, Boone and Logan Counties, WV – WVDOH
Principal Investigator
Phase I Archaeology, Abbreviated Technical Report, State Project #U303-85/20-0.01 00. Report prepared for the West Virginia Division of Highways.

Seminole Road, Summers County, WV – WVDOH
Principal Investigator
Phase I Archaeology, State Project #S345-21/1-1.15 00. Report prepared for the West Virginia Division of Highways.

District 3 Headquarters, City of Parkersburg, Wood County, WV – WVDOH
Principal Investigator
Phase I Archaeology, State Project #G054-HDQ-1.00. Report prepared for West Virginia Division of Highways.

Chief Logan Connector Project, Logan County, WV – WVDOH
Principal Investigator
Phase I Archaeology and Above-Ground Historic Resources Survey, State Project #X323-210/24-0.00. Report prepared for the West Virginia Division of Highways.

Pleasantview Bridge Replacement, Tyler County, WV – WVDOH
Principal Investigator
Phase I Archaeology Abbreviated Technical Report, State Project #S348-18-19.41, Federal Project #BR-0018(110) D. Report prepared for the West Virginia Division of Highways.

Mill Creek Road Boy Scout Reserve, Fayette and Raleigh Counties, WV – WVDOH
Principal Investigator
Phase I Archaeology, State Project #U310-16-0.00. Report prepared for the West Virginia Division of Highways.

U.S. 35 Improvements Project, Reconnection of Old US 35 Near Henderson, Mason County, WV – WVDOH
Principal Investigator
Phase I Archaeology Survey, Management Summary, State Project #U220-35-0.02 02, Federal Project #CM-0035(107). Report prepared for the West Virginia Division of Highways.

Monongahela River Locks and Dams Hydroelectric Projects (Morgantown and Opekiska), Monongalia County, WV – USACE
Principal Investigator
Phase I Archaeology. Report prepared for Free Flow Power Corporation and Chester Engineers.

Route 9 Ladies Borrow Area, Jefferson County, WV – WVDOH
Principal Investigator
Phase I Archaeology Survey. Report prepared for the West Virginia Division of Highways.

U.S. 35 Improvements, Smithland Farm Proposed Fill Area, Mason County, WV – WVDOH
Principal Investigator
Phase I Archaeology Survey, State Project #U220-35-0.02 02, Federal Project #CM-0035(107). Report prepared for the West Virginia Division of Highways.

Jessica L. S. Schumer, M.A., RPA

Archaeology Group Leader, Senior Archaeologist

EDUCATION

M.A. Archaeology
University of Pittsburgh, 2008

B.A. Archaeology
Pennsylvania State University, 2001

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2015 (35100174)

Historic Archaeologist-Specialization in Historic Ceramic and Glass Manufacturing Technologies

MEMBERSHIPS

West Virginia Archaeological Society

Council for West Virginia Archaeology

TRAINING

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EXPERIENCE

Mr. Rowles currently oversees all Section 106 activities and tasks for Markosky, including geomorphology, archaeology, and architectural history. He has extensive experience particularly with archaeological work, ranging from the orchestration of various types of Phase I, II, and III projects, as well as the management of Section 106 on hundreds of transportation projects most recently as a Cultural Resource Professional (CRP) for PennDOT. In his experiences, Mr. Rowles has coordinated with members of the public, project stakeholders, consulting parties, and Tribes and Nations, in addition to conducting various levels of project-specific research, report and other deliverable writing, geomorphological surveys, geophysical surveys, unmarked grave surveys and identification, determinations of eligibility and effect, author of various agreement documents (i.e., PA, MOA, MOU), predictive modeling (including multiple reviews of the PA statewide pre-contact predictive model and its application), pre-contact and historic period artifact analysis, artifact curation, innovative and alternative forms of mitigation, and coordination of cultural resources during design, as well as during construction to ensure environmental mitigation commitments are met.

Select Project Experience

SR 2005, Section 02B, 2017 Blair County DF Box Culvert, Blair County – PennDOT District 9-0
Project Manager
This project involved the replacement of the bridge carrying SR 2005 over Middletown Run. Markosky conducted historic document and deed research, and Phase I archaeological investigations that recorded the Millerstown 1 Site (36BL0124); an early to mid-19th Century blacksmith/wagon shop. Markosky then completed the Phase II excavations that resulted in an eligible determination of the archaeological site. Markosky is currently assisting the District with consulting party and agency coordination by presenting multiple alternative mitigation options as part of the Section 106 and consulting party process.

SR 4012, Section 251, Offsite Wetland Mitigation Site for the SR 4012 Group Bridges, Butler County, PA – PennDOT District 10-0
Project Manager
Mr. Rowles oversaw the Phase I archaeological testing of a proposed wetland mitigation site required due to proposed impacts at three separate bridge locations. A PA SHPO Negative Survey Report was completed.

SR 0281, Section 023, Gilmore to Welsh Hill Road, Somerset County – PennDOT District 9-0
Project Manager
This project involved the reconstruction of approximately 13 miles of SR 0281 in Somerset County, including a slope adjacent to a historic cemetery. Notified of the project as it entered the construction phase, Markosky conducted the Phase I archaeological investigations at locations throughout the project area, clearing a majority for construction. Markosky also conducted a geophysical survey within the project area adjacent to the Cemetery to identify any potential graves. The survey recorded several anomalies, and follow-up archaeological testing revealed an early to late 19th Century historic archaeological site (Mostoller site), as well as several historic graves. Markosky conducted additional historic document, deed, and title research to aid the District with legal right-of-way activities, as well as drafted a project Memorandum of Agreement, Plan of Action, survey of historic cemetery boundaries, public involvement, and assisted with court hearings and permitting regarding the removal of any potential historic graves. Mr. Rowles then coordinated the additional Phase II testing that was required, as well as oversight of the investigation and removal of several historic graves prior to construction. All work was completed without delay to any construction schedules.

SR 0006, Section M36, Sugar Creek to Gulf Road, Bradford County, PA – PennDOT District 3-0
Project Manager
Oversaw the Phase I archaeological survey along approximately 3 miles of proposed roadway reconstruction, including through a previously recorded archaeological site. Completed a Phase I archaeological survey report that recommended the few artifacts recovered did not contribute to the overall eligibility of the archaeological site, and therefore recommended a *No Adverse Effect*.

Ryan A. Rowles, M.A., RPA
Cultural Resources Department Manager

EDUCATION

M.A. Archaeology
University of Oklahoma, 2004

B.A. Archaeology
Indiana University of Pennsylvania, 2001

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2004 (37427894)

MEMBERSHIPS

West Virginia Archaeological Society

TRAINING

Section 106 in the New Regulatory Environment

Advanced Section 106: Resolving Adverse Effect and Writing Agreement Documents

Section 4(f) for Specialists

Context Sensitive Solutions

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SR 3041, Section A10, SR 3041 over Short Creek, Washington County – PennDOT District 12-0
Project Manager
Oversaw the completion of the geomorphological survey and Phase I investigations of the deeply stratified pre-contact archaeological site for this bridge project crossing over Short Creek in rural southern Washington County. The archaeological survey identified a complicated lithic reduction site of Ten Mile chert. Mr. Rowles coordinated closely with the District to assist project design to avoid the potentially eligible archaeological site, and assisted with the development of mitigation commitments to be followed through construction.

SR 1019, Section 251, West Winfield Bridge No. 1, Butler County – PennDOT District 10-0
Project Manager
First informed of the project as it headed into construction, Markosky completed the Phase I and II archaeological investigations for the project. In coordination with the District and the contractor, Markosky completed the work without delay to the construction schedule.

South Perry Street Bridge, PennDOT District 1-0
Project Manager
Oversaw assisting the District with the QA/QC review of the Historic Bridge Rehabilitation (Feasibility) Report review, Determination of Effects report, and Section 106 consulting party coordination.

SR 4009, Section B01, Watts Mill Road Bridge, Beaver County – PennDOT District 11-0
Project Manager
Oversaw assistance with the project Purpose and Need, Determinations of Eligibility, the Effects Report, and Resolution of Adverse Effects of this 1878 wrought iron, pin-connected Pratt pony truss bridge.

Select Tribal Consultation Experience

As a regional archaeologist for the Pennsylvania Department of Transportation for almost 9 years, Mr. Rowles was delegated by FHWA to consult with various Tribes and Nations. Whereas Tribal consultation typically only occurs as federal government to federal government coordination, FHWA delegated Mr. Rowles to speak to the Tribes and Nations on their behalf on hundreds of transportation projects.

Select Archaeological Projects with Tribal Consultation

SR 0018, Section X10 Browns Creek Bridge, Greene County, PA – PennDOT District 12-0
PennDOT Regional Archaeologist – Section 106 Coordination of Pre-Contact Graves
Management of 106 between multiple federal and state agencies, and Tribes and Nations of previously recorded pre-contact graves at bridge replacement project. Project consisted of geomorphology, GPR, contract special provisions, mitigation commitments, archaeological monitoring, and more. Coordinated Tribal consultation, which included meeting representatives from the Absentee-Shawnee Tribe, as well as the Seneca Nation to review the proposed project design, visit the project location, and discuss face-to-face any concerns and plans. Successfully moved forward the bridge and intersection realignment project without any project delays and avoided any impacts to existing pre-contact graves.

SR 0356, Section 06M Freeport Bridge over Allegheny River, Westmoreland, Allegheny, Butler, and Armstrong Counties, PA – PennDOT District 12-0
PennDOT Regional Archaeologist – Archaeological Management and Tribal Consultation
Coordinated with Tribes and Nations regarding their concern for previously recorded pre-contact sites located along the Allegheny River. This project in particular had project-specific issues at the location of the large river bridge crossing. Discussed project, alleviated concerns, and moved project forward.

I-70, Section 21H, Bentleyville Interchange, Washington County, PA - PennDOT District 12-0
PennDOT Regional Archaeologist- Phase I – III Archaeological and Section 106 Management
Coordination and management of geomorphological, geophysical, and archaeological surveys through authorship of an agreement document (MOA), Phase III data recovery plan, research design, and public education between multiple agencies, consulting parties, and Tribes and Nations. Specifically coordinated concerns and mitigation commitments with Tribal groups through construction.

Ryan A. Rowles, M.A., RPA
Cultural Resources Department Manager

EDUCATION

M.A. Archaeology
University of Oklahoma, 2004

B.A. Archaeology
Indiana University of Pennsylvania, 2001

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2004 (37427894)

MEMBERSHIPS

West Virginia Archaeological Society

TRAINING

Section 106 in the New Regulatory Environment

Advanced Section 106: Resolving Adverse Effect and Writing Agreement Documents

Section 4(f) for Specialists

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EXPERIENCE

Mr. Gajewski is an Archaeological Field Director with 17 years of experience in the field of Archaeology. He specializes in cultural resource surveys, investigations, and data recoveries of prehistoric and historic archaeological sites throughout the Mid-Atlantic region. He has extensive experience with field directing projects for varying types of clients within the public and private sector and is especially reliable on long-term linear, large parcel, and multiple-state projects. His duties include: the direction of field crews, field artifact and site identification, stratigraphic interpretation, the organization of field data, and laboratory analyses/curation of artifacts.

Project Experience

Fourth Street Arch Bridge Replacement Project, Lewis County, WV
West Virginia Division of Highways
Field Director – Phase IA Reconnaissance/Geomorphological Assessment and Phase IB Survey
This project involved a study to evaluate and determine the most suitable and economical location for the replacement of the existing Fourth Street Arch Bridge (#21-N16/70-0.02) over the West Fork River in Weston, Lewis County, WV. The project required the documentation of the existing bridge location in downtown as well as the survey for a proposed replacement location approximately one-half mile downstream. Survey of the replacement bridge location required a geomorphological assessment of the flood plain along West Fork River as well as systematic shovel testing. The survey was conducted in accordance with WV SHPO guidelines.

US Route 35 Road Improvement Project, Mason and Putnam Counties, WV
West Virginia Division of Highways
Archaeologist – Phase I Survey, Phase II Investigations, and Phase III Data Recovery
This large-scale transportation project involved all phases of archaeological survey for a newly proposed US Route 35 corridor in Mason and Putnam Counties, WV. Initial Phase I survey documented numerous archaeological sites and subsequent Phase II investigations identified one site to be eligible for the National Register of Historic Places (NRHP). Phase III Data Recovery excavations were carried out at the Threemile Creek Rockshelter (46MS305) in Mason County. All phases of survey and excavation were carried out in accordance with WV SHPO guidelines.

US Route 50 Widening Project, Taylor County, WV
West Virginia Division of Highways
Archaeologist – Phase III Data Recovery
This project involved the Phase III Data Recovery excavations of two previously recorded sites, 46TA023 and 46TA024, along a section of US Route 50 in Pruntytown, Taylor County, WV in advance of a road widening project. The survey was conducted in accordance with WV SHPO guidelines.

West Virginia General Services Office Building Monitoring, Logan County, WV
WV General Services Division
Archaeologist – Archaeological Monitoring
The project involved archaeological monitoring during the construction of a new state office building in downtown Logan, WV for the General Services Division. Construction impacts to a previously recorded National Register of Historic Places (NHRP) eligible site, 46LG0004, were monitored and mitigated during active construction of the building. Monitoring was carried out in accordance with WV SHPO guidelines.

Deep Valley POD Project, Ritchie County, WV
Dominion Transmission, Inc.
Field Director – Phase IA Reconnaissance and Phase IB Survey
This pipeline project involved the geomorphological assessment, pedestrian survey and systematic shovel testing of a proposed gas pipeline ROW in Ritchie County, WV. Numerous historic and prehistoric-era sites were documented however no sites were recommended eligible for the National Register of Historic Places (NRHP). The survey was carried out in accordance with WV SHPO guidelines.

Scott R. Gajewski

Archaeological Field & Lab Director

EDUCATION

B.S. Anthropology
Franciscan University of Steubenville, 2001

MEMBERSHIPS

West Virginia Archaeological Society

Society for American Archaeology

Pennsylvania Archaeological Council

SAFETY TRAINING

OSHA 10-Hour Construction Safety Training (AOS), August 2017

Safeland USA and SafeGulf Safety Training (PEC Safety), August 2013

National Safety Council Defensive Driving Course, May 2010

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H-162 Pipeline Replacement Project, Kanawha and Clay Counties, WV
Dominion Transmission, Inc.
Archaeologist – Phase I Survey, Phase II Investigations, and Phase III Data Recovery
This large-scale pipeline project involved the pedestrian survey and systematic shovel testing of a proposed gas pipeline ROW in Kanawha and Clay Counties, WV. Initial Phase I survey identified numerous sites that underwent subsequent Phase II Investigations to determine their eligibility for the National Register of Historic Places (NRHP). Mr. Gajewski field directed the Phase II Investigations at 46KA602 and 46KA622. Construction impacts could not avoid the Witcher Creek Site (46KA622), therefore Phase III Data Recovery excavations were undertaken. All phases of survey and excavation were carried out in accordance with WV SHPO guidelines and Federal Energy Regulatory Commission (FERC) regulations.

Appalachian Gateway (TL-590) Project, Marshall County, WV
Dominion Transmission, Inc.
Archaeologist– Phase I Survey and Phase II Investigations
This large-scale pipeline project involved the pedestrian survey and systematic shovel testing of a proposed gas pipeline ROW in Marshall County, WV. Initial Phase I survey identified two sites that underwent subsequent Phase II Investigations to determine their eligibility for the National Register of Historic Places (NRHP). The Brushy Ridge Site (46MR141) (historic) and Fish Creek Site (46MR139) (prehistoric) were both determined to be eligible for the NRHP. The survey and investigations were carried out in accordance with WV SHPO guidelines and Federal Energy Regulatory Commission (FERC) regulations.

Kanawha Valley Area (KVA) North and South Improvement Projects, Kanawha County, WV
American Electric Power Company
Field Director – Phase I Survey
This large-scale energy infrastructure project involved the survey of 12 separate 138kV powerline upgrade corridors (50+ miles) and the survey and documentation of over 100 project-related access roads (200+ miles). Within the KVA North project, survey of the Amos-Chemical, Amos-Turner, Turner-Chemical, the UUC #8 Tap Line, and Amos-Sporn 138kV lines were surveyed. Within the KVA South project, survey of the Cabin Creek-Turner, Amos-Logan, Southridge Extension, Ruth Loop, Hernshaw Extension, and Chesterfield Avenue Extension 138kV lines were surveyed. Numerous prehistoric and historic era sites potentially eligible for the National Register of Historic Places (NRHP) were documented, however American Electric Power was able to redesign the pending upgrades to avoid significant impacts. The survey was carried out in accordance with WV SHPO guidelines.

East Mountain Compressor Station Project, Tyler County, WV
Antero Midstream Partners LP
Field Director – Phase I Survey
This project was carried out in advance of a well pad project in northwestern West Virginia. Pedestrian survey and systematic shovel testing was carried out for a proposed 25-acre well pad. Shovel testing documented the Haymond Ridge Site which was determined to ineligible for the National Register of Historic Places (NRHP). The survey was carried out in accordance with WV SHPO guidelines.

MEPCO Pipeline Project, Monongalia County, WV
DTE Energy Corporation
Field Director – Phase I Survey
This pipeline project involved the pedestrian survey and systematic shovel testing of a proposed gas pipeline in Monongalia County, WV. The survey was carried out in accordance with WV SHPO guidelines.

South Chestnut Wind Farm Project, Fayette County, WV
Iberdrola Renewables, Inc.
Archaeologist – Phase I Survey
This project was carried out in advance of the construction of a large-scale wind farm project along South Chestnut Ridge in Fayette County, WV. The project involved the survey of 20+ turbine locations, meterological stations, and other miscellaneous facilities in addition to project-related access roads. The survey was carried out in accordance with WV SHPO guidelines.

Scott R. Gajewski

Archaeological Field & Lab Director

EDUCATION

B.S. Anthropology
Franciscan University of Steubenville, 2001

MEMBERSHIPS

West Virginia Archaeological Society

Society for American Archaeology

Pennsylvania Archaeological Council

SAFETY TRAINING

OSHA 10-Hour Construction Safety Training (AOS), August 2017

Safeland USA and SafeGulf Safety Training (PEC Safety), August 2013

National Safety Council Defensive Driving Course, May 2010

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MARKOSKY

EXPERIENCE

Mr. McKeel is an Archaeological Principal Investigator with 9 years of experience in the field of Archaeology. His duties include; managing and assisting with planning, developing, and conducting all phases of archaeological survey. He also develops recommendations of eligibility and effect and ensures project compliance with applicable federal and/or state laws and regulations. His duties also include conducting laboratory analyses and curation, preparing reports, articles, and presentations, and managing personnel. Justin has previous experience in spatial analysis, database management and analysis, and producing project and site maps using ESRI ArcGIS.

Select Project Experience

Tunnel Road Wetland Mitigation Project, Somerset County, PA – USACE Pittsburgh District
Principal Investigator – Geomorphology, Phase I
This project involves the design and construction of a wetland mitigation bank. As a consultant to Hunt Valley Environmental, Markosky conducted the geomorphological, archaeological, and historic structures surveys prior to project construction. A PA SHPO Negative Survey Report was completed.

SR 0268, Section 252, PA 268 over Lowrey Run, Butler County, PA – PennDOT District 10-0
Principal Investigator – Geomorphology, Phase I
Markosky conducted geomorphological investigations and Phase IB archaeological investigations for this bridge replacement project. One previously recorded archaeological site was encountered and a Phase I report was prepared that recommended the few artifacts recovered did not contribute to the overall eligibility of the archaeological site, and therefore recommended a *No Adverse Effect*.

SR 4067, Section A10, SR 4067 over Branch of Pine Run, Westmoreland County, PA PennDOT District 12-0
Principal Investigator – Phase I
The proposed project proposed to replace the existing structure carrying SR 4067 over a branch of Pine Run in Westmoreland County, in an area near the Revolutionary War-period Fort Hand. Markosky completed a Phase I archaeological survey, including a metal detecting survey; no historic period archaeological resources were identified and a PA SHPO Negative Survey Report was prepared.

SR 3041, Section A10, SR 3041 over Short Creek, Washington County, PA PennDOT District 12-0
Principal Investigator – Phase I
Markosky completed Phase IB archaeological investigations and supplemental geomorphological investigations for this bridge replacement project. One deeply stratified pre-contact period archaeological site was encountered and a Phase I archaeological report was prepared.

SR 0160, Section 000, Wellersburg Truck Ramp, Somerset County, PA – PennDOT District 9-0
Principal Investigator – Phase I
This project involves the construction of a runaway truck ramp in Wellersburg Borough, Somerset County in an area of high probability for historic period archaeological resources. Markosky completed a Phase I archaeological survey that identified one newly recorded archaeological site, one newly recorded above ground historic resource, and expanded one previously recorded archaeological site.

SR 0219, Section 44M, US 219 Carrolltown Improvements, Cambria County, PA PennDOT District 9-0
Principal Investigator – Phase I
This project involved the design of improvements to increase safety along SR 219 in East Carroll Township and Carrolltown Borough, Cambria County. As a subconsultant to Gannett Fleming, Markosky completed a Phase I archaeological survey, identifying a late 19th to early 20th century farmhouse. A Phase I report was prepared that recommended the site not eligible based on the substantial late 20th century disturbance to the site.

Justin McKeel, M.A., RPA

Archaeological Principal Investigator

EDUCATION

M.A. Anthropology
University of Wyoming, 2015

B.A. Anthropology
University of Pittsburgh at Greensburg, 2012

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2016 (39362568)

Pre-Contact Archaeologist- Specialization in Lithic Reduction Technologies

MEMBERSHIPS

West Virginia Archaeological Society

Council for West Virginia Archaeology

TRAINING

Section 106 Principles and Practice

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SR 1019, Section 251, West Winfield Bridge #1, Butler County, PA – PennDOT District 10-0
Principal Investigator – Phase I/Phase II
First informed of the project as it headed into construction, Markosky completed the Phase I and II archaeological investigations for the project. In coordination with the District and the contractor, Markosky completed the work without delay to the construction schedule. Mr. McKeel was responsible for the Phase I Archaeological Survey, Phase II Archeological Testing, and all reporting including the summary of findings for both Phase I and Phase II, the Recommendation of Eligibility for the West Winfield Garage (36BT0503) and the final Phase I Archaeological Survey and Phase II Archaeological Testing report.

SR 3002, Section 02B over Bear Creek, Fulton Department Force Box Culvert, Fulton County, PA PennDOT District 9-0
Principal Investigator – Phase I
Markosky conducted Phase I Archaeological Investigations and reporting for this bridge replacement project. A PA SHPO Negative Survey Report was completed.

SR 0614, P3 RBRP JV-573 over Newburg Run, Cumberland County, PA – PennDOT District 8-0
Principal Investigator – Phase I
Markosky conducted Phase I Archaeological Investigations and reporting for this bridge replacement project as part of the Pennsylvania Rapid Bridge Replacement Project. A PA SHPO Negative Survey Report was completed.

SR 2005, Section 02B Blair Department Force Box Culvert, Blair County, PA – PennDOT District 9-0
Principal Investigator – Phase II
This project involves the replacement of the bridge carrying SR 2005 (Auction Road) over Middletown Run in North Woodbury Township. As a sub-consultant to EADS Group, Markosky conducted Phase I archaeological survey that led to the recordation of the Millerstown 1 Site (36BL0124); a 19th Century blacksmith shop. Mr. McKeel oversaw the Phase II archaeological investigations, and in coordination with the CRP and PA SHPO, the site was determined potentially eligible for the NRHP. A combined Phase I/Phase II report was prepared.

SR 0861, Section 350, South Leatherwood Bridge, Clarion County, PA – PennDOT District 10-0
Principal Investigator – Phase I
Markosky conducted the Phase I archaeological survey and reporting for this bridge replacement project. One isolated pre-contact period artifact was recovered, but it did not constitute an archaeological site. A Phase I report was prepared.

SR 0006, Section M36, Sugar Creek to Gulf Road, Bradford County, PA – PennDOT District 3-0
Principal Investigator – Phase I
This project involved approximately 3 miles of proposed roadway reconstruction, including through a previously recorded archaeological site. Markosky completed a Phase I archaeological survey and the subsequent report recommended that the few artifacts recovered did not contribute to the overall eligibility of the archaeological site, and therefore recommended a *No Adverse Effect*.

Previous Project Experience

Sine Well Pad Project, Tyler County, WV – Antero Resources
Archaeologist – Phase I

DTI TL-255 Pipeline 2017 Replacement, Wirt and Wood Counties, WV – Dominion
Archaeologist – Phase I

Atlantic Coast Pipeline Project, George Washington National Forest, VA – Dominion
Archaeologist - Phase II
Phase II archaeological investigations of four prehistoric sites via close interval STP and 1x1m test unit excavation. Also conducted lithic analysis of over 50,000 quartzite artifacts.

Justin McKeel, M.A., RPA

Archaeological Principal Investigator

EDUCATION

M.A. Anthropology
University of Wyoming, 2015

B.A. Anthropology
University of Pittsburgh at Greensburg, 2012

QUALIFICATIONS & REGISTRATIONS

Secretary of Interior Standards for Archaeology (36CFR§61)

Register of Professional Archaeologists (RPA) – 2016 (39362568)

Pre-Contact Archaeologist- Specialization in Lithic Reduction Technologies

MEMBERSHIPS

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Council for West Virginia Archaeology

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EXPERIENCE

Ms. Baughman is a Staff Archaeologist/GIS Technician with 2 years of experience in the field of Archaeology and 5 years of experience in the field of GIS. Her duties include: assisting with planning, developing, and conducting all phases of archaeological survey; creating and developing report graphics; using GIS to assist in archaeological interpretations; assisting with artifact processing, analysis, and curation; developing GIS databases and standards; ensuring GIS data meets state and federal standards; GPS preparation prior to fieldwork; processing GPS data upon completion of fieldwork; and processing CAD, raster, and image data for development of shapefiles, maps and graphics.

Select Project Experience

Home Bridge No. 3 Replacement, Indiana County, PA - PennDOT District 10-0
Staff Archaeologist/GIS Technician – Phase I/ Phase II/ Phase III
Ms. Baughman assisted with fieldwork on all three phases of the identification and evaluation of the blacksmith shop site, developed spatial data and created various field maps to assist with excavation, assisted with artifact processing, and developed maps and graphics for all reports for this project.

SR 0281 Gilmore to Welsh Hill Road, Somerset County, PA - PennDOT District 9-0
Staff Archaeologist/GIS Technician – Phase I/ Phase II/ Graves
Ms. Baughman assisted with fieldwork at all phases and grave removal, assisted with artifact processing, and developed maps and graphics for all reports for this project. She also created a database and map series of the historic graves in the cemetery that was used in the archaeological interpretations. Completion of this data was done primarily by image processing and prior recordation due to the deterioration of the stones.

Tunnel Road Wetland Mitigation Project, Somerset County, PA – Hunt Valley Environmental USACE Pittsburgh District
Staff Archaeologist/GIS Technician – Geomorphology, Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, and developed maps and graphics for the Phase I report.

SR 3041, Section A10, SR 3041 over Short Creek, Washington County, PA - PennDOT District 12-0
Staff Archaeologist/GIS Technician – Phase IB
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, assisted in artifact processing and analysis, and developed maps and graphics for the Phase I archaeological report.

SR 0219, Section 44M, US 219 Carrolltown Improvements, Cambria County, PA – PennDOT District 9-0
Staff Archaeologist/GIS Technician– Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey of the historic farmstead, developed spatial data, and developed maps and graphics for the Phase I report.

SR 1019, Section 251, West Winfield Bridge #1, Butler County, PA - PennDOT District 10-0
Staff Archaeologist/GIS Technician – Phase I
Ms. Baughman assisted with fieldwork for the Phase I Investigations in the historic mining community, developed spatial data, and developed maps and graphics for all reports for this project.

SR 2005, Section 02B Blair County Department Force Box Culvert, Blair County – PennDOT District 9-0
Staff Archaeologist/GIS Technician – Phase I/Phase II
Ms. Baughman assisted with fieldwork for the Phase II Investigations of the early 19th Century blacksmith shop, developed spatial data, and developed maps and graphics for all reports for this project.

Sarah Baughman

Staff Archaeologist/ GIS Technician

EDUCATION

B.A. Anthropology
Indiana University of Pennsylvania, 2017

B.A. Geography
Indiana University of Pennsylvania, 2017

MEMBERSHIPS

West Virginia Archaeological Society

TRAINING

ESRI Training Course Certifications

- Terrain Analysis Using ArcGIS
- Georeferencing Raster Data Using ArcGIS
- Working with Coordinate Systems in ArcGIS
- Hazus-MH 2.0 in ArcGIS
- Image Processing with ArcGIS
- Using Raster Data for Site Selection
- Network Analysis Using ArcGIS
- 3D Visualization Techniques Using ArcGIS
- Solving Spatial Problems Using ArcGIS
- Creating and Editing Metadata in ArcGIS
- Managing Lidar Data Using Terrain Datasets

GPS Principles and Techniques

Remote Sensing

Main Office
3689 Route 711
Ligonier, PA 15658

West Virginia Office
232 Capitol Street
Charleston, WV 25301

Southpointe Office
1900 Main Street, Suite 255
Canonsburg, PA 15317

724.238.4138
www.markosky.com

SR 0268, Section 252, PA 268 over Lowrey Run - PennDOT District 10-0
Staff Archaeologist/GIS Technician – Geomorphology, Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, assisted in the refining of the previous site boundary, assisted in the artifact processing and analysis, and developed maps and graphics for the Phase I Report.

Ambridge Borough Historic Buildings Survey and Ordinance
Staff Archaeologist/GIS Technician
Ms. Baughman assisted with this project by developing field maps and creating GIS data.

SR 2005, Section 01B, 2019 DF Fulton Box Culvert – PennDOT District 9-0
Staff Archaeologist/GIS Technician– Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, processed and assisted in analyzing artifacts, and developed maps and graphics for the Phase I report.

SR 0006, Section m36, Sugar Creek to Gulf Road – PennDOT District 3-0
Staff Archaeologist/GIS Technician – Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, and developed maps and graphics for the Phase I report.

Pennsylvania Rapid Bridge Replacement Project, JV-567 - HDR
Staff Archaeologist/GIS Technician – Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, and developed maps and graphics for the Phase I report.

SR 4001, Section 451, Five Points Road Bridge – PennDOT District 10-0
Staff Archaeologist/GIS Technician – Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, and developed maps and graphics for the Phase I report.

SR 4019, Section 01B, 2020 DF Huntingdon Box Culvert – PennDOT District 9-0
Staff Archaeologist/GIS Technician – Phase I
Ms. Baughman assisted with fieldwork for the Phase I Survey, developed spatial data, and developed maps and graphics for the Phase I report.

Impact Corry Historic Structure Survey
Staff Archaeologist/GIS Technician
Ms. Baughman assisted with this project by developing field maps and creating GIS data.

Previous Project Experience

Beaver County Network Analysis and County-Wide Improvement/Development - Beaver County Office of Planning and Redevelopment
Student
Beaver County asked for the assistance of Indiana University of Pennsylvania to create a GIS database that would allow them to pinpoint prime areas for improvement/development within the county. The entire analysis and database creation was done by Ms. Baughman and two other students.

Archaeological Investigations of the Squirrel Hill Site - Indiana University of Pennsylvania
Student
This Squirrel Hill Site is a small Monongahelan village in northern Westmoreland County. After the completion of 6 weeks of fieldwork, Ms. Baughman processed and analyzed artifacts and features from three of the test units excavated.

Sarah Baughman

Staff Archaeologist/ GIS Technician

EDUCATION

B.A. Anthropology
Indiana University of Pennsylvania, 2017

B.A. Geography
Indiana University of Pennsylvania, 2017

MEMBERSHIPS

West Virginia Archaeological Society

TRAINING

ESRI Training Course Certifications
- Terrain Analysis Using ArcGIS
- Georeferencing Raster Data Using ArcGIS
- Working with Coordinate Systems in ArcGIS
- Hazus-MH 2.0 in ArcGIS
- Image Processing with ArcGIS
- Using Raster Data for Site Selection
- Network Analysis Using ArcGIS
- 3D Visualization Techniques Using ArcGIS
- Solving Spatial Problems Using ArcGIS
- Creating and Editing Metadata in ArcGIS
- Managing Lidar Data Using Terrain Datasets

GPS Principles and Techniques

Remote Sensing

Main Office
3689 Route 711
Ligonier, PA 15658

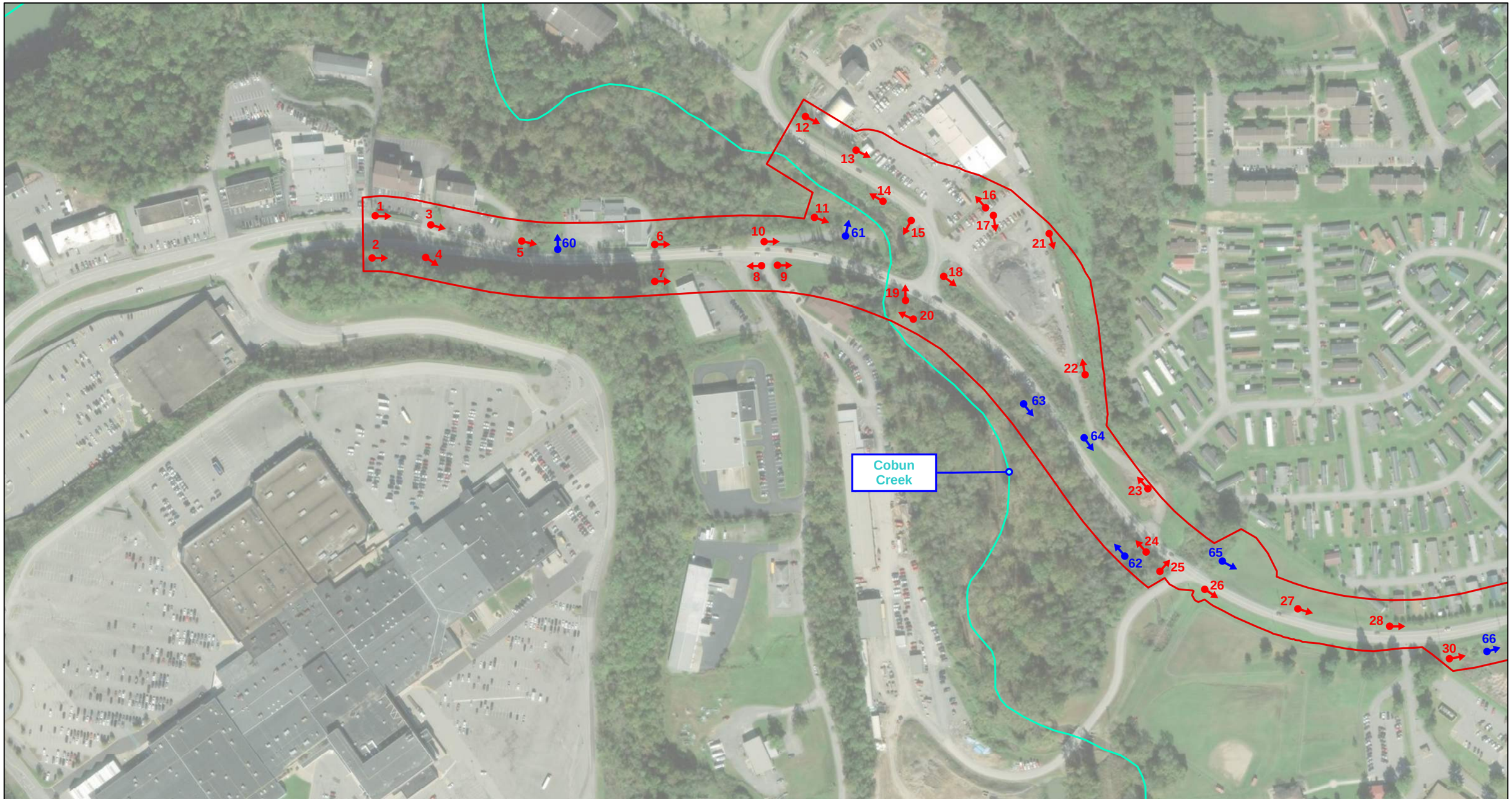
West Virginia Office
232 Capitol Street
Charleston, WV 25301

Southpointe Office
1900 Main Street, Suite 255
Canonsburg, PA 15317

724.238.4138
www.markosky.com

APPENDIX B

Photograph Location Map



N
W E
S

MARKOSKY

Feet
0 100 200 300 400

Meters
0 30 60 90 120

Archaeological Study Area

Photo Location - Overview

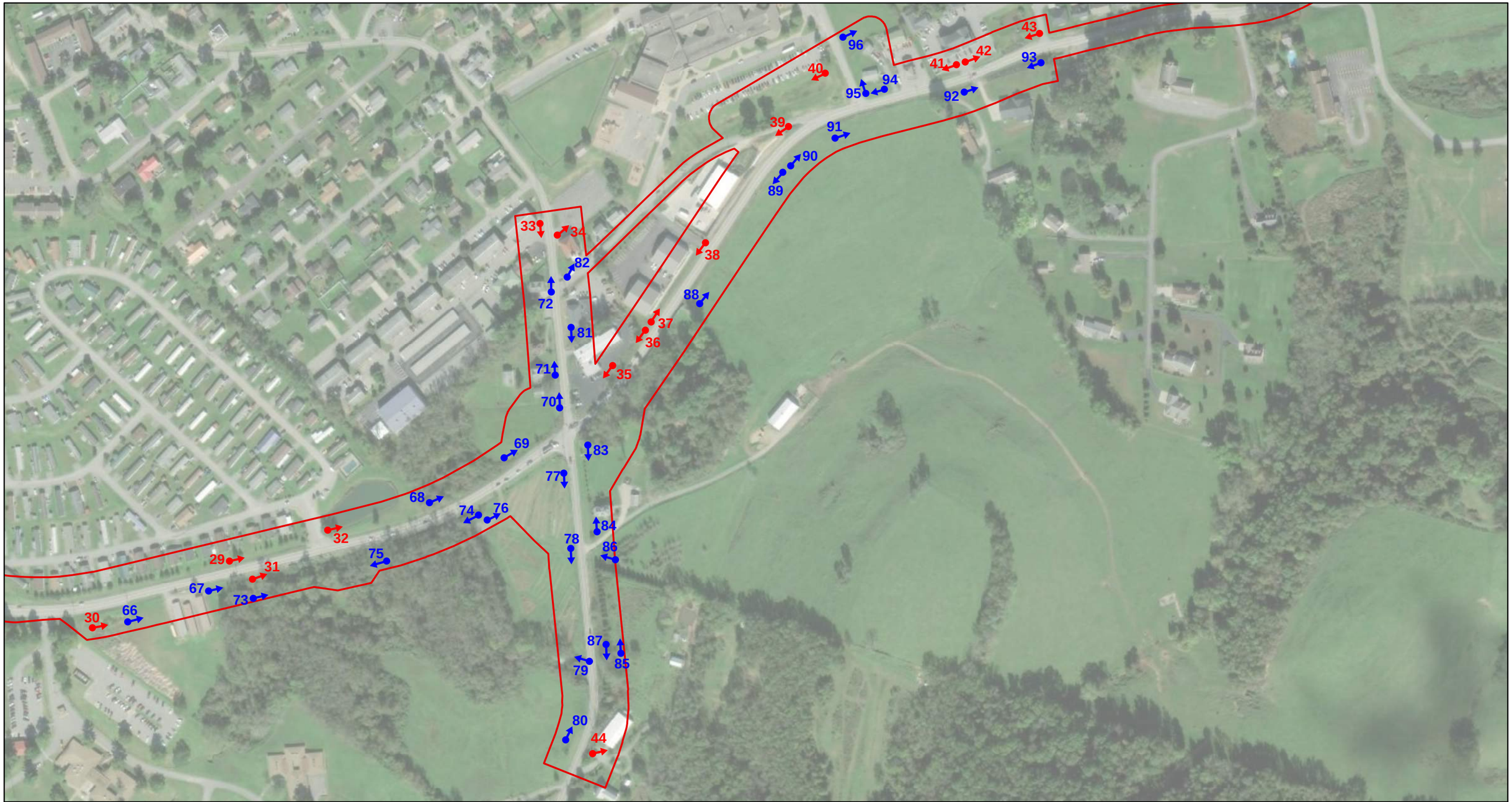
Photo Location - Test Area

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Photograph Location Map
Sheet 1 of 3



N
W E
S

MARKOSKY

Feet
0 100 200 300 400

Meters
0 30 60 90 120

Archaeological Study Area

Photo Location - Overview

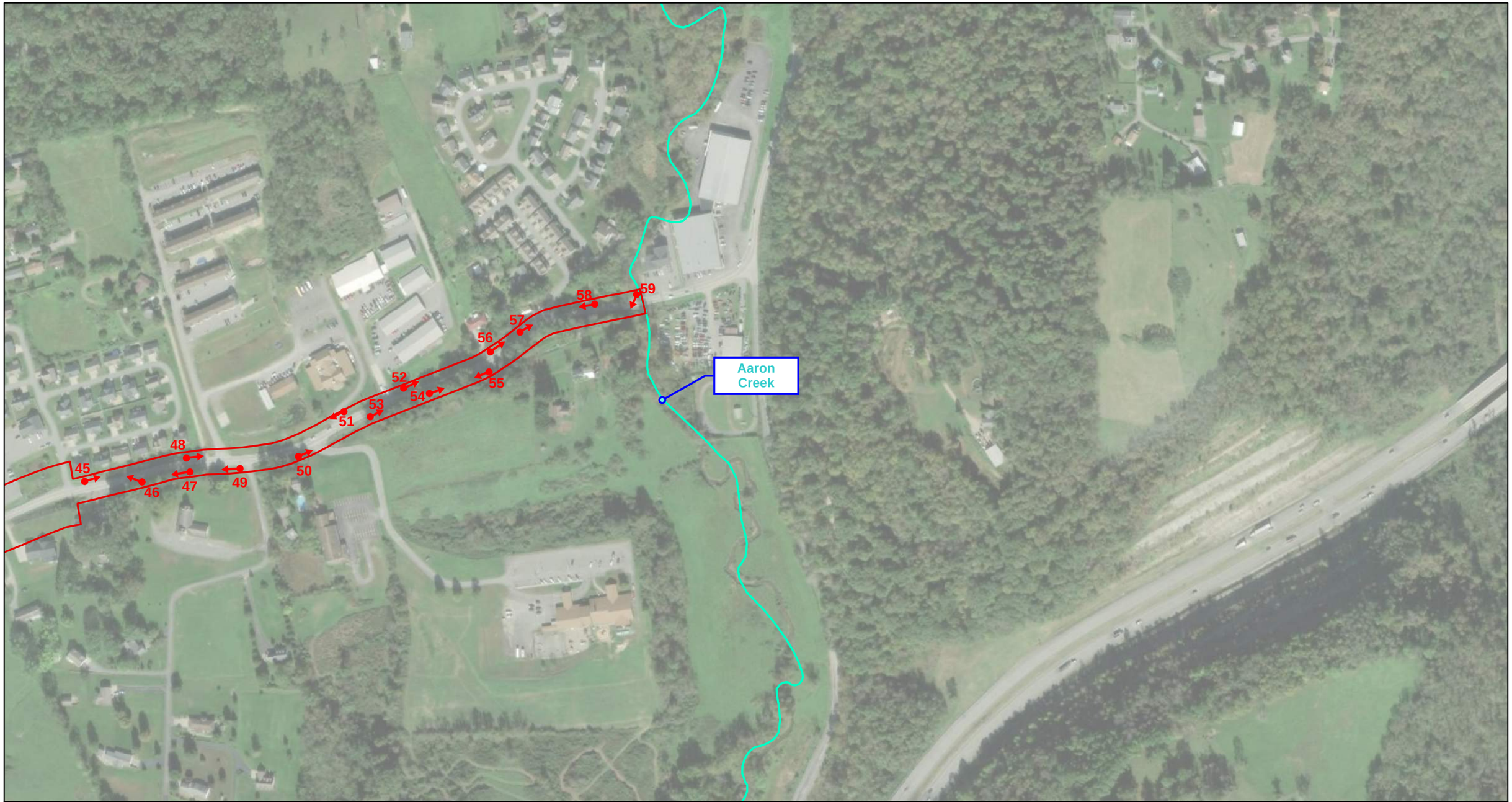
Photo Location - Test Area

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Photograph Location Map
Sheet 2 of 3



N
W E
S

MARKOSKY

Feet
0 100 200 300 400

Meters
0 30 60 90 120

Archaeological Study Area

Photo Location - Overview

Photo Location - Test Area

Greenbag Road Improvement
Phase I Archaeological Survey
Abbreviated Technical Report

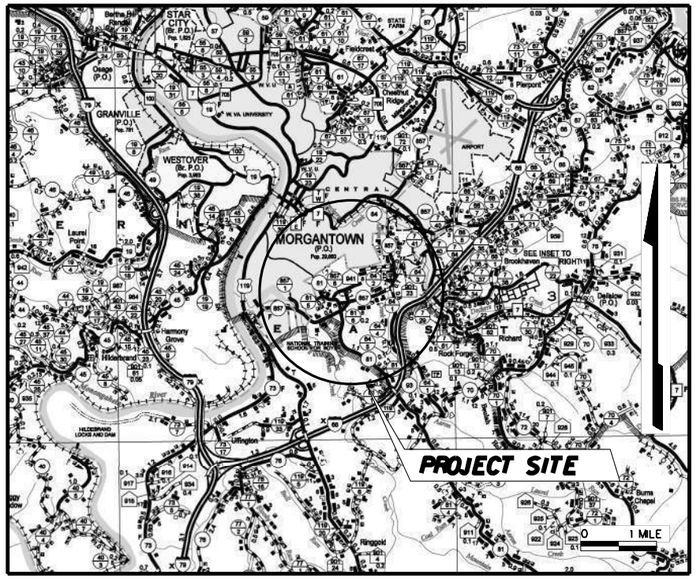
Monongalia County
West Virginia

Aerial Photography Source: World Imagery (ESRI 2018)

Photograph Location Map
Sheet 3 of 3

APPENDIX C

APE: Based on Preliminary Field Review Design (3/29/2019)



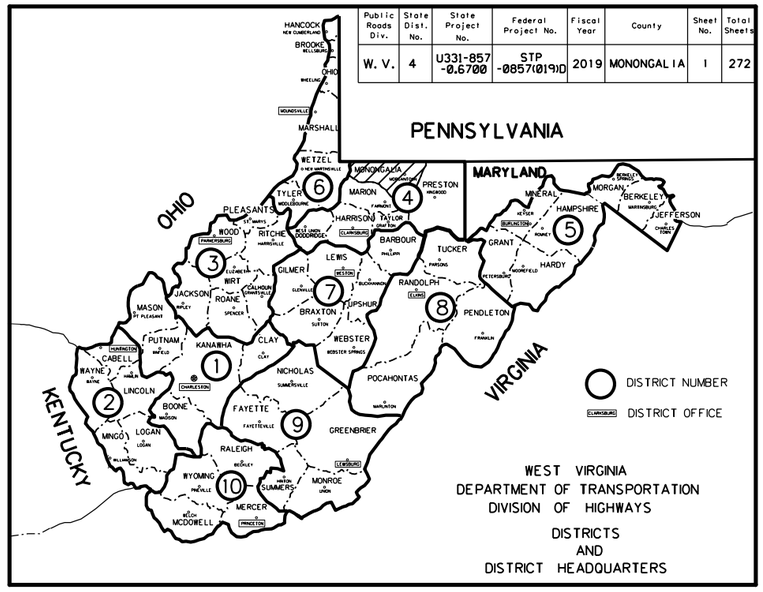
WEST VIRGINIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR CONSTRUCTION
OF
STATE HIGHWAY

FEDERAL PROJECT NO. STP-0857(019)D
STATE PROJECT NO. U331-857-067 00
STATE ROUTE NO. 857
MORGAN DISTRICT
MONONGALIA COUNTY

GREENBAG ROAD

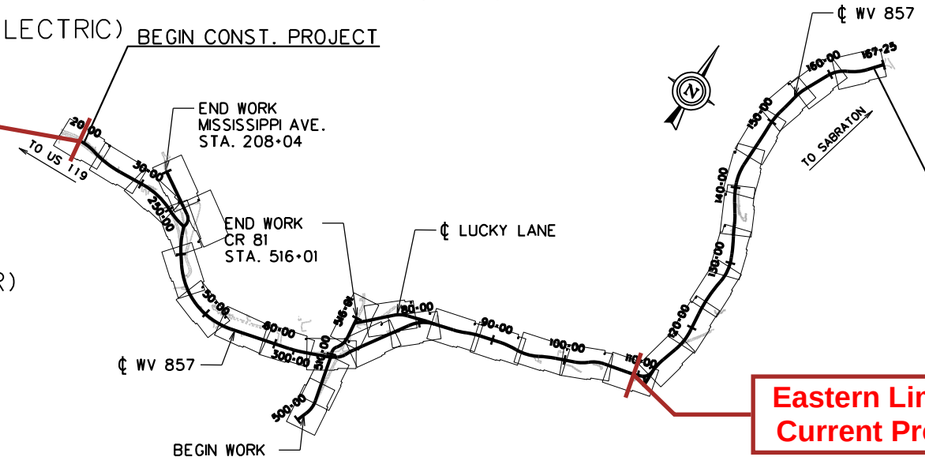
	Station		Station		f.t.		mile(s)
(BEGIN TO MISS. AVE.)	24+00	to	252+95.79	-	1,405	-	0.266
(MISS. AVE. TO CR 81)	252+95.79	to	304+93.28	-	3,013	-	0.571
(CR 81 TO LUCKEY LANE)	304+93.28	to	82+22.99	-	1,475	-	0.279
(LUCKEY LANE TO AARONS CREEK RD.)	82+22.99	to	110+94.89	-	2,872	-	0.544
(AARONS CREEK RD. TO END)	110+94.89	to	166+00	-	5,505	-	1.043
	Total Project Length				14,270		2.703

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	1	272



UTILITIES ENCOUNTERED

FRONTIER WEST VIRGINIA INC. (TELEPHONE)
TRANS-ALLEGHENY INTERSTATE LINE COMPANY (ELECTRIC)
A.V. COMPANY INC. (GAS)
CARDINAL NATURAL GAS
NORTHERN DIVISION (GAS)
HOPE GAS INC. (GAS)
MONONGAHELA POWER COMPANY (ELECTRIC)
MOUNTAINEER GAS COMPANY (GAS)
DECKERS CREEK PUBLIC SERVICE DISTRICT (SEWER)
CLINTON WATER ASSOCIATION, INC. -
(WATER ASSOCIATIONS/AUTHORITIES)
MORGANTOWN UTILITY BOARD (MUB)
COMCAST COMMUNICATIONS LLC (CABLE)



TYPE OF CONSTRUCTION

ROADWAY WIDENING, GRADE, DRAINAGE, PAVEMENT, PAVEMENT MARKING, SIGNING & ROUNDABOUTS.

PFR SUBMITTAL
MARCH 29, 2019

NOTES: STANDARD DETAIL BOOK VOL. I DATED MAY 2016 & VOLUME II DATED JANUARY 2019, SHALL APPLY TO THIS PROJECT.

SCALES

PLAN HOR. 0 20 ft.
PROFILE VERT. 5 ft. 0
HOR. 0 20 ft.

DESIGN DESIGNATION

A.D.T. (2018 -)	11,127
A.D.T. (2048 -)	14,999
D.H.V.	" 783
D	" 54/46
T	" 4.4%
V	" 40 MPH

CONVENTIONAL SIGNS

- STATE LINE
- COUNTY LINE
- CORPORATION LINE
- PROPOSED R/W & EASEMENT LINE
- EXISTING R/W LINE
- PROPERTY LINE
- EXISTING FENCE
- PROPOSED FENCE
- EDGE OF STREAM
- PROPOSED GUARD RAIL
- EXISTING GUARD RAIL
- RAILROAD
- G GAS LINE
- W WATER LINE
- T TELEPHONE LINE
- E ELECTRIC LINE
- TELEPHONE POLE
- POWER POLE
- COMBINED POWER AND TELEPHONE POLE
- TREE
- SHRUB
- RIGHT OF WAY MARKER

LAYOUT SCALE
0 1000 ft.

INDEX TO SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2-6	TYPICAL SECTIONS
7-8	SUMMARY OF QUANTITIES
9	GENERAL NOTES
10-14	GEOMETRIC LAYOUT
15-16	MAINTENANCE OF TRAFFIC PLANS
17	REFERENCE POINTS
18-49	PLAN SHEETS
50-84	PROFILE SHEETS
85-89	OWNERSHIP INDEX
90-96	PROPERTY MAPS
97-101	SOIL AND GEOLOGIC INFORMATION PLANS
102-272	CROSS SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

..... 20.....
I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT.....

.....
EXECUTIVE SECRETARY

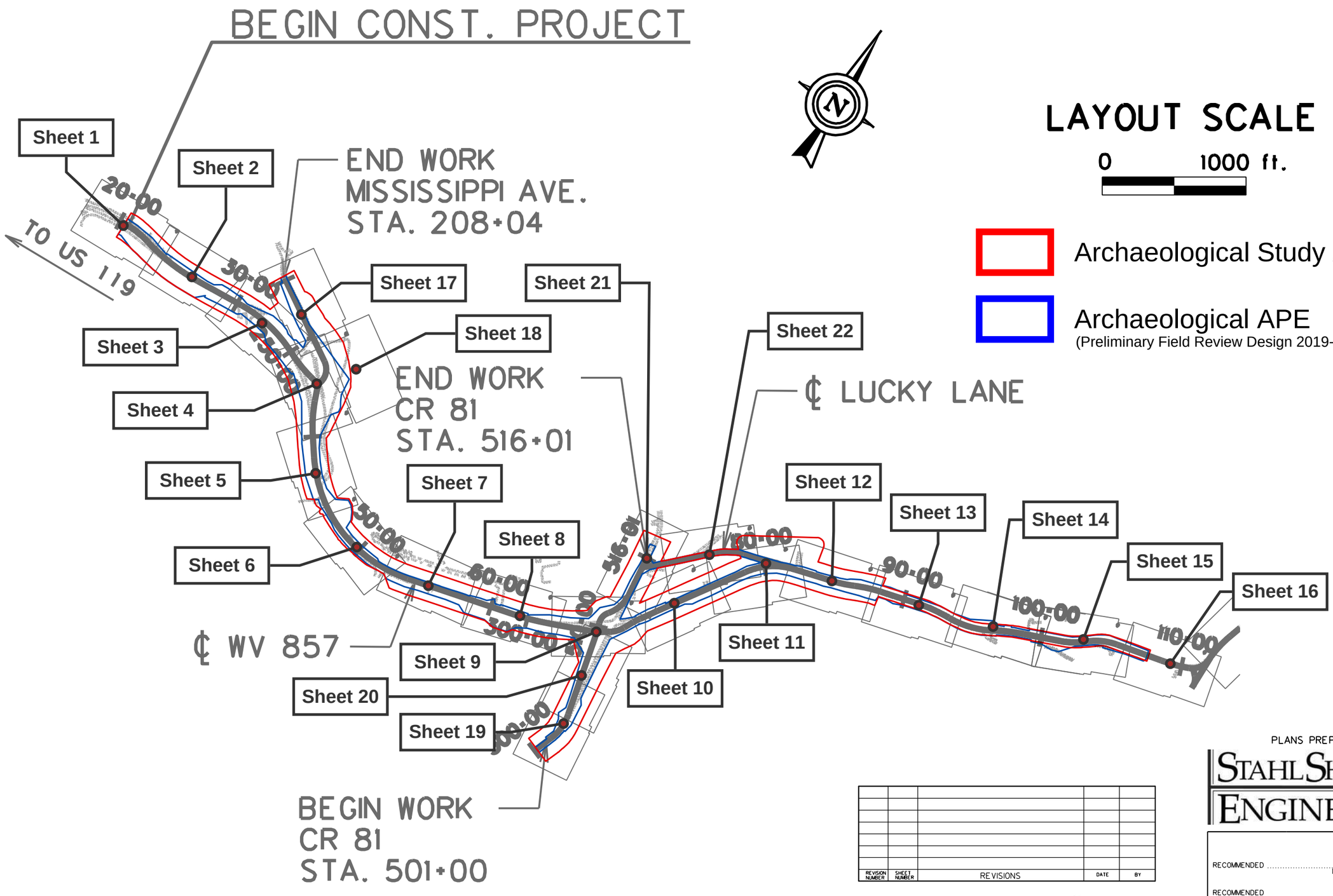
PLANS PREPARED BY:
STAHL SHEAFFER ENGINEERING

RECOMMENDED ..... DESIGNER
RECOMMENDED FOR APPROVAL ..... STATE HIGHWAY ENGINEER
APPROVED ..... COMMISSIONER OF HIGHWAYS

PROJECT NO. U331-857-0.67 00 / STP-0857 (019)D

J05C50C08-TITLE 1

$$$$$$$$$$FILENAME$$$$$$$$$$
DD-MM-YYYY HH:MM
$USERNAME$



REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

..... 20.....

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT.....

.....

EXECUTIVE SECRETARY

PLANS PREPARED BY:

STAHL SHEAFFER ENGINEERING

RECOMMENDED ..... DESIGNER

RECOMMENDED FOR APPROVAL ..... STATE HIGHWAY ENGINEER

APPROVED ..... COMMISSIONER OF HIGHWAYS

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	18	272

- Study Area
- Test Area Location
- APE (Preliminary Field Review Design 2019-03-29)
- Roadway
- Slope
- Disturbed
- Wet
- 4-Inch Bucket Auger Probe
- STP

BEGIN CONST. PROJECT
STA. 20+66

PI 21+21.67

EX. R/W

Greenbag Road

GREENBAG ROAD ASPH.

℄ W 857

20+00

21+00

CURVE #1

22+00

P.C. 20+00.00

P.T. 22+40.76

MATCHLINE STA. 23+00

BEGIN TAPER
STA. 20+66

EX. R/W

EX. R/W

CURVE #1

P.I. Sta. 21+21.67
D = 20° 22' 34" (RT)
Dc = 8° 27' 47"
R = 677.00'
T = 121.67'
L = 240.76'
SE = MATCH EXISTING

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 1 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:12 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	19	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Test Area 1

A1

1
2
3
4
5

END TAPER STA. 23+57.50

MATCHLINE STA. 23+50

MATCHLINE STA. 29+50

EX. R/W
R/W
15" PIPE
2" PLASTIC GAS MAIN
TYPE B INLET
PVC WATER MAIN DRAWN PER RECORD
8"PVC WATER MAIN DRAWN PER RECORD
15" CMP
TCE
GTS AND MARKER

24+00
25+00
26+00
27+00
28+00
29+00

℄ WV 857
GREEN BAG ROAD
ASPH.

Greenbag Road

N 87° 52' 16" E

P.I. 24+65.78

P.I. 26+86.95

CURVE #2

P.I. Sta. 24+65.78
D = 18° 19' 32" (LT)
Dc = 4° 06' 26"
R = 1,395.00'
T = 225.01'
L = 446.18'
SE = 4.8%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 2 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:13 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	20	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Test Area 2

A1

SEE SHEET 44

EX. WETLAND

TR 1

R/W

EX. R/W

Greenbag Road

30+00 31+00 32+00 33+00 34+00 35+00

CURVE #3

TYPE B INLET

15" PIPE

TYPE A MH

AP 9

AP 10

24" PIPE

AP 8

24" PIPE

MATCHLINE STA. 29+50

MATCHLINE STA. 35+00

GREENBAG ROAD OUTFALL #3

8" CLAY

ASPH.

GRASS

WOODS

Cobun Creek

2 X 8' BOX EXTENSION

TOE

4 5 6-5 67

CURVE #3

P.I. Sta. 32+77.73
D = 28° 39' 39" (RT)
Dc = 6° 03' 47"
R = 945.00'
T = 241.41'
L = 472.71'
SE = 6.2%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 3 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:15 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	21	272

MATCHLINE (SEE SHEET 45)

MATCHLINE STA. 203+20 (SEE SHEET 44)

MATCHLINE STA. 35+00

MATCHLINE STA. 256+00

TR 3

Mississippi Street

Greenbag Road

℄ MISSISSIPPI AVE.

℄ MISSISSIPPI AVE. STA. 200+80

BL CONST. WV 857 ROUNDABOUT STA. 252+95.79

STA. ℄ WV 857 35+09.03 =
STA. BL CONST. WV 857 ROUNDABOUT
P.T. 250+00

CURVE #6
P.I. Sta. 201+08.15
D = 82° 01' 20" (LT)
Dc = 46° 04' 22"
R = 124.36'
T = 108.15'
L = 178.03'
SE = N.C.

CURVE #5
P.I. Sta. 255+39.28
D = 14° 16' 16" (LT)
Dc = 5° 43' 46"
R = 1,000.00'

CURVE #4

P.C. 200+00
P.I. 201+08.15
P.I. 201+78.03
P.I. 252+20.01
P.I. 252+95.79
P.C. 254+14.10
P.I. 255+39.28
P.C. 259+00.00

D=118°
S 76° 04' 25" E
S 20° 32' 11" E

TYPE A MANHOLE
TYPE B INLET
TYPE C INLET
TYPE G INLET
15" PIPE
12" PIPE
18"

10' BERM 905
Bottom AVG elev 900

EX. CITY R/W
EX. R/W
R/W
TR 2
TR 6
6-3
7
C 5

A1
A2
A3
A4
A5
A6
A7
A8
A9
A10

Test Area 3

Study Area
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Disturbed
4-Inch Bucket Auger Probe
Test Area Location
Slope
Wet
STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

Sheet 4 of 22

4/1/2019
9:23:16 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	22	272

STA. ℄ WV 857 41+26.56 =
STA. BL CONST. WV 857 ROUNDABOUT
P.T. 256+63.17

MATCHLINE STA. 256+00

MATCHLINE STA. 46+50

Test Area 5

Test Area 4

Test Area 3

AP 11

A1 A2 A3 A4 A5 A11 A12 A13 A14 A15 A16

TR 1

EX. R/W

R/W

EX. WETLAND

EX. STREAM

EX. STREAM

36" PIPE EXTENSION

41+00 TYPE B INLET

42+00 15" PIPE

43+00 TYPE B INLET

44+00

45+00 TYPE B INLET

46+00

CURVE +5

S 34° 48' 27" E

CURVE +7

℄ WV 857

Greenbag Road

GREEN BAG ROAD ASPH.

GRAVEL

GATE

8" PVC

SHED

CURVE +7

P.I. Sta. 49+13.66
D = 67° 50' 43" (LT)
Dc = 5° 59' 58"
R = 955.00'

Study Area	Test Area Location
APE (Preliminary Field Review Design 2019-03-29)	
Roadway	Slope
Disturbed	Wet
4-Inch Bucket Auger Probe	STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 5 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:17 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	23	272

Test Area 5

B1 B2 A1 A2 A3 A4 A5 A6 A7

Greenbag Road

MATCHLINE STA. 46+50

MATCHLINE STA. 52+50

TYPE B INLET 47+00

℄ WV 857

48+00

CURVE #7

49+00 TYPE B INLET

50+00

51+00 TYPE B INLET

52+00

P.I. 49+13.66

15" PIPE

12" PIPE

EX. R/W

R/W

EX. CITY R/W

FCI Morgantown Kennedy Center

6-5

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 6 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:18 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	24	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

VIRGINIA CIRCLE
YIELD SIGN
9
8" PVC
6" PVC
10" CLAY
MP-P #283595 4015
EX. R/W
TYPE B INLET
15" PIPE
58+00
℄ WV 857
N 77° 20' 51" E
MATCHLINE STA. 58+70
57+00
56+00
55+00
54+00
53+00
MATCHLINE STA. 52+50
P.T. 54+02.22
CURVE #7
GREEN BAG ROAD ASPH.
Greenbag Road
GRASS
POSTED
MP-P #283576 4512
R/W
A1
A2
A3
A4
AP 1
AP 2
AP 12
B1
B2
B3
B17
10-1
Test Unit 1
Test Area 8
Test Area 6
Unnamed Tributary
FCI Morgantown Kennedy Center

CURVE #7
P.I. Sta. 49+13.66
D = 67° 50' 43" (LT)
Dc = 5° 59' 58"
R = 955.00'
T = 642.28'
L = 1,130.84'
SE = 6.2%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Sheet 7 of 22

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:19 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	25	272

Study Area
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Disturbed
4-Inch Bucket Auger Probe
Test Area Location
Slope
Wet
STP

Test Area 7

Test Area 8

Unnamed Tributary

B1 B2 A1 A2 B18 B19 B20 B21 B22 B23 B24 B25 B26 B27 B28 C1 C2

℄ WV 857 STA. 60+65.26 = ℄ VIRGINIA CIR. STA. 300+00

STA. ℄ WV 857 62+78.74 = STA. BL CONST. WV 857 ROUNDABOUT 300+00.00

MATCHLINE STA. 58+70

MATCHLINE STA. 302+00

Greenbag Road

℄ VIRGINIA CIR.

GREEN BAG ROAD

TYPE B INLET

TYPE C INLET

TYPE G INLET

15" PIPE

18" PIPE

24" PIPE

12" PIPE

80' PIPE EXTENSION

2' CLEARANCE AT CROSS PIPES

STREAM TO BYPASS POND

STORMWATER POND

TRENCH DRAIN

TCE

EX. R/W

R/W

TR 1 TR 2 TR 3 TR-1

P.I. 62+11.41

P.I. 301+13.07

CURVE •8

P.I. Sta. 62+45.08
D = 3° 06' 13" (LT)
Dc = 4° 36' 34"
R = 1,243.00'
T = 33.67'
L = 67.33'
SE = N.C.

CURVE •9

P.I. Sta. 301+13.07
D = 5° 09' 31" (LT)
Dc = 2° 16' 58"
R = 2,510.00'
T = 113.07'
L = 225.99'
SE = N.C.

EX. WETLAND

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:20 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	26	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Test Area 7

Test Area 8

Test Area 10

AP 3

AP 4

MATCHLINE STA. 512+50 (SEE SHEET 48)

MATCHLINE STA. 308+00

MATCHLINE STA. 302+00

MATCHLINE STA. 508+00 (SEE SHEET 47)

Greenbag Road

Dorsey Avenue

Kingwood Pike

@WV 857 ROUNDABOUT

@CR 81 ROUNDABOUT

¢ WV 857 STA. 304+93.28 = ¢ CR 81 STA. 509+58.84

CURVE •9
P.I. Sta. 301+13.07
D = 5° 09' 31" (LT)
Dc = 2° 16' 58"
R = 2,510.00'
T = 113.07'
L = 225.99'
SE = N.C.

CURVE •10
P.I. Sta. 306+37.65
D = 28° 51' 38" (LT)
Dc = 28° 38' 52"
R = 200.00'
T = 51.46'
L = 100.74'
SE = N.C.

SCALE : 0 20 ft. 40 ft.

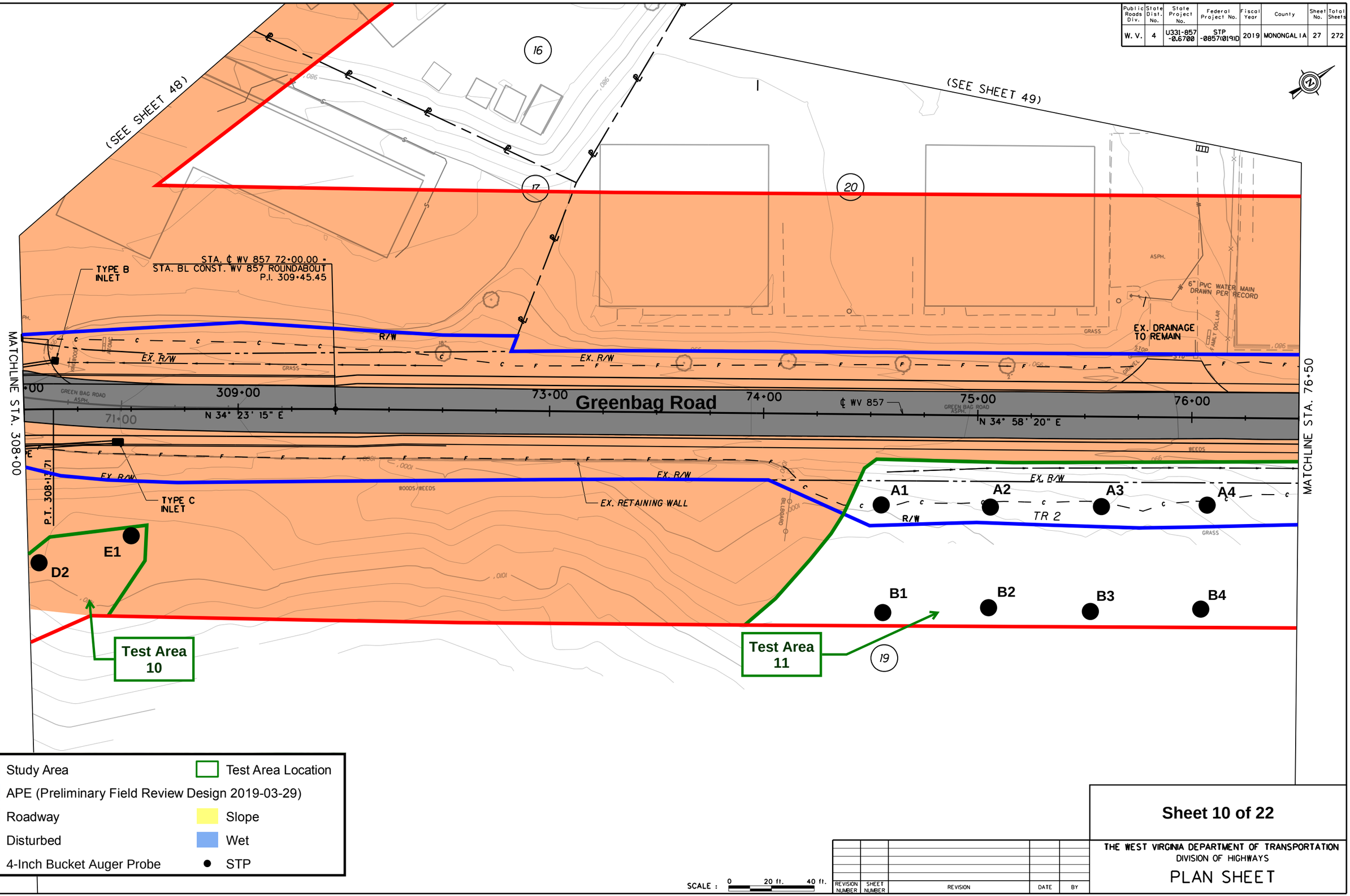
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	27	272



Study Area
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Disturbed
4-Inch Bucket Auger Probe
Test Area Location
Slope
Wet
STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:35 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	28	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

CURVE #15D
P.I. Sta. 500+60.74
D = 9° 34' 15" (LT)
Dc = 7° 53' 49"
R = 725.55'
T = 60.74'
L = 121.20'
SE = N.C.

MATCHLINE STA. 503+50 (SEE SHEET 49)

Luckey Lane
S 76° 15' 52" W
S 74° 26' 27" W
EX. R/W
℄ LUCKEY LANE
P.I. 502+21.20
P.I. 80+53.91
P.I. 500+60.74
STORM WATER DETENTION POND
STORM WATER POND
15" PIPE
CURVE #14
CURVE #15D
501+00
500+00
81+00
80+00
79+00
78+00
77+00
℄ WV 857
Greenbag Road
GREENBAG ROAD
GREEN BAG ROAD
ASPH.
GRASS
TCE
EX. R/W
R/W
P.C. 78+59.10
P.C. 500+00.00
TR 2
20
19

MATCHLINE STA. 76+50
MATCHLINE STA. 82+00

A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15
B5 B6 B7 B8 B9 B10 B11 B12 B13 B14

CURVE #14
P.I. Sta. 80+53.91
D = 41° 19' 45" (RT)
Dc = 11° 41' 35"
R = 490.00'
T = 184.81'
L = 353.45'
SE = 8.0%

Test Area 11

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:36 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	29	272

Test Area 12

Test Area 11

A1 A2 A3 A4 A5 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 B15 B16 B17 B18 B19 B20

Greenbag Road

N 76° 18' 05" E

℄ WV 857

℄ RICHARD AVE. STA. 600+00

℄ WV 857 STA. 82+38.81 = ℄ RICHARD AVE. STA. 600+00

℄ WV 857 STA. 82+22.99 = ℄ LUCKEY LANE STA. 500+00

CURVE #16

CURVE #17

P.I. Sta. 85+66.88

P.I. Sta. 87+49.21

P.C. 84+28.87

P.R.C. 86+54.44

P.T. 82+22.56

MATCHLINE STA. 82+00

MATCHLINE STA. 88+00

1 STORY BRICK

2 STORY VINYL

2 STORY BRICK/ VINYL

1 STORY WOOD

21 22 23 24 25 19 19-A

Study Area

APE (Preliminary Field Review Design 2019-03-29)

Roadway

Disturbed

4-Inch Bucket Auger Probe

Test Area Location

Slope

Wet

STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	30	272

Not Included as Part of Design as of 10/31/2019

Not Included as Part of Design as of 10/31/2019

Test Area 11

Jonathan Lane

JONATHAN LANE

Greenbag Road

ASHWORTH LANE

MATCHLINE STA. 88+00

MATCHLINE STA. 94+00

℄ WV 857 STA. 88+30.82 = ℄ JONATHAN LANE STA. 700+00

℄ WV 857 STA. 93+34.71 = ℄ ASHWORTH LANE STA. 800+00

CURVE #18
P.I. Sta. 92+35.35
D = 12° 59' 41" (RT)
Dc = 5° 36' 03"
R = 1,023.00'
T = 116.51'
L = 232.01'
SE = 6.0%

CURVE #19
P.I. Sta. 95+11.65
D = 29° 01' 58" (LT)
Dc = 9° 13' 35"
R = 621.00'
T = 160.79'
L = 314.67'
SE = 7.6%

- Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Roadway
- Disturbed
- 4-Inch Bucket Auger Probe
- Test Area Location
- Slope
- Wet
- STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	31	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Not Included as Part of Design as of 10/31/2019

Not Included as Part of Design as of 10/31/2019

Not Included as Part of Design as of 10/31/2019

℄ WV 857 STA. 94+05.28 =
℄ GLEN OAKS DRIVE STA. 900+00

MATCHLINE STA. 94+00

MATCHLINE STA. 100+00

℄ GLEN OAKS DRIVE 900+98

℄ WV 857

P.I. 95+65.55

P.I. 95+11.63

P.I. 97+77.14

P.I. 98+88.30

CURVE #19
P.I. Sta. 95+11.65
D = 29° 01' 58" (LT)
Dc = 9° 13' 35"
R = 621.00'
T = 160.79'
L = 314.67'
SE = 7.6%

CURVE #20
P.I. Sta. 97+77.14
D = 8° 58' 56" (RT)
Dc = 4° 01' 55"
R = 1,421.00'
T = 111.61'
L =
SE

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:40 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	32	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

MATCHLINE STA. 100+00

MATCHLINE STA. 106+20

36

37

35

P.I. 104+40.07

P.R.C. 103+30.99

P.C.I. 102+50.25

℄ WV 857

CURVE #22

CURVE #21

EXISTING 36"/42" PIPE TO REMAIN

EX. PIPE TO REMAIN

EX. TO REMAIN

EX. R/W

R/W

TYPE C INLET

15" PIPE

36" PIPE EXTENSION

TR 1

TR 3

P.I. 102+41.48

P.I. 105+44.70

4" PLASTIC GAS MAIN DRAWN PER RECORD

8" PVC WATER MAIN DRAWN PER RECORD

2" PLASTIC GAS MAIN

8" PVC WATER MAIN

GAS VALVES AND CONC PAD

GAS VALVE AND MARKER

GTS AND MARKER

TELECOM SYSTEM

GREEN BAG ROAD ASPH.

LONG BRANCH DRIVE ASPH.

GRAVEL

TCE

Not Included as Part of Design as of 10/31/2019

Not Included as Part of Design as of 10/31/2019

CURVE #21
P.I. Sta. 102+41.48
D = 19° 12' 46" (LT)
Dc = 10° 37' 48"
R = 539.00'
T = 91.23'
L = 180.74'
SE = 4.6%

CURVE #22
P.I. Sta. 104+40.07
D = 28° 16' 44" (RT)
Dc = 13° 13' 56"
R = 433.00'
T = 109.08'
L = 213.71'
SE = 5.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:41 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	33	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

MATCHLINE STA. 106+20

MATCHLINE STA. 112+00

Not Included as Part of Design as of 10/31/2019

STA. ℄ WV 857 110+94.89
STA. ℄ AARONS CREED RD. 1100+00

END WORK
STA. 1102+48.20

CURVE #23
P.I. Sta. 109+64.93
D = 9° 31' 54" (LT)
Dc = 4° 48' 24"
R = 1,192.00'
T = 99.38'
L = 198.30'
SE = 5.4%

CURVE #24
P.I. Sta. 111+51.77
D = 66° 08' 48" (LT)
Dc = 42° 26' 29"
R = 135.00'
T = 87.92'
L = 155.85'
SE = 8.0%

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:41 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	44	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

END WORK
STA. 208+04.26

P.T. 208+04.26

EX. R/W

MISSISSIPPI AVE.

208+00
207+00
206+00
Mississippi Street
205+00
204+00

N 56° 32' 44" W

R/W

TYPE G INLET

12" PIPE

8" STEEL

8" CLAY

8" PVC

TR 2

EX. CITY R/W

GAS MAIN NOT SHOWN ON GAS RECORDS

6-2

MATCHLINE STA. 203+20 (SEE SHEET 21)

(SEE SHEET 20)

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET

4/1/2019
9:23:50 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	45	272

- Study Area
- Test Area Location
- APE (Preliminary Field Review Design 2019-03-29)
- Roadway
- Slope
- Disturbed
- Wet
- 4-Inch Bucket Auger Probe
- STP

MATCHLINE (SEE SHEET 44)

CITY OF MORGANTOWN

MAINTENANCE ACCESS

R/W

R/W

TR 3

6-2

MATCHLINE (SEE SHEET 21)

950'
940'
930'
920'
910'

S10

S

6" PVC

SCALE : 0 20 ft. 40 ft.

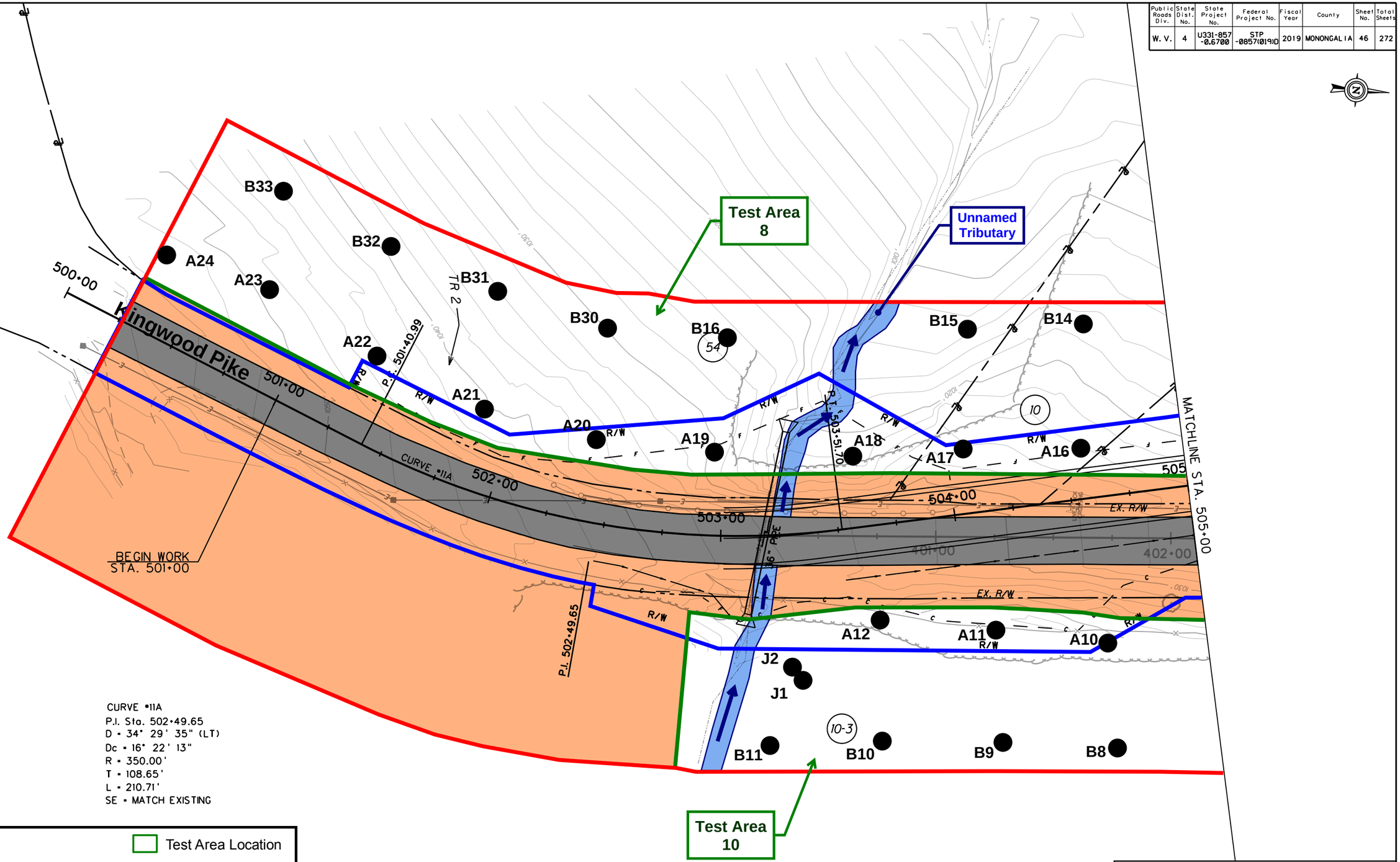
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY
		9		

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:51 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	46	272



CURVE #11A
P.I. Sta. 502+49.65
D = 34° 29' 35" (LT)
Dc = 16° 22' 13"
R = 350.00'
T = 108.65'
L = 210.71'
SE = MATCH EXISTING

- Study Area
- APE (Preliminary Field Review Design 2019-03-29)
- Roadway
- Disturbed
- 4-Inch Bucket Auger Probe
- Test Area Location
- Slope
- Wet
- STP

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	47	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Test Area 8

B13 B12 B11 B10 B9 B8

A15 A14 A13 A12 A11 A10 A9

A9 A8 A7 A6 A5 A4

B7 B6 B5 B4 B3

Test Area 10

R/W

EX. R/W

CR 81 ROUNDABOUT

Kingwood Pike

KINGWOOD PIKE ASPH.

TYPE G INLET

15" PIPE

505+00

506+00

507+00

508+00

403+00

404+00

405+00

MATCHLINE STA. 505+00

MATCHLINE STA. 508+00 (SEE SHEET 26)

(SEE SHEET 27)

56.3 ?

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:53 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	4	U331-857 -0.6700	STP -0857(019)D	2019	MONONGALIA	48	272

Study Area
Test Area Location
APE (Preliminary Field Review Design 2019-03-29)
Roadway
Slope
Disturbed
Wet
4-Inch Bucket Auger Probe
STP

Test Area 7

Test Area 9

Dorsey Avenue

Luckey Lane

Parkway Drive

℄ CR 81 STA. 515+29.85
℄ LUCKEY LANE STA. 510+36

℄ LUCKEY LANE

A1
A2
A12
A13
A14
A15
A16

TYPE B INLET

END WORK STA. 516+01

MATCHLINE STA. 512+50 (SEE SHEET 26)

MATCHLINE STA 509+00 (SEE SHEET 49)

(SEE SHEET 27)

CURVE #12

P.I. Sta. 512+25.07
D = 44° 29' 07" (LT)
Dc = 22° 55' 06"
R = 250.00'
T = 102.24'
L = 194.10'
SE = R.C.

SCALE : 0 20 ft. 40 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

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THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLAN SHEET

4/1/2019
9:23:54 AM

Greenbag Road Improvement Project

Appendix G

Secondary and Cumulative Effects Analysis

Greenbag Road Improvement Project

Secondary and Cumulative Effects Analysis

Monongalia County, West Virginia

State Project: U331-857-0.67
Federal Project: STP-0857(019)D

U.S. Department of Transportation

Federal Highway Administration

West Virginia Department of Transportation
Division of Highways

December 2019

1.0 Background

Cumulative effects are decided by the Council on Environmental Quality (CEQ) as "*the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions*" (CEQ 2005). Cumulative effects can occur from repeated impacts resulting from a single project, added effects from multiple sources, or impacts resulting from the interactions of numerous sources. Secondary effects are impacts "*caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable*" (CEQ 2005). These are generally induced by the action and examples include growth and development and/or land use change.

The Project includes widening and improvements to the Greenbag Road intersections with Mississippi Street and Dorsey Avenue, and other operational improvements for vehicular and multimodal traffic along Greenbag Road. The Project is expected to reduce congestion and address the lack of safe non-motorized connections along the corridor.

This Cumulative Effects Analysis incorporated information gathered from field views, reviews of US Census data, and information from local planning documents. A Secondary and Cumulative Effects Study Area was delineated for the purposes of this analysis. The Secondary and Cumulative Effects Study Area was generally based on a 0.5-mile buffer of the Project and encompasses other planned or proposed projects including or in the vicinity of Greenbag Road. The analysis evaluated potential Cumulative Effects that may occur through a horizon year of 2045, which is consistent with the current planning horizon identified in the Morgantown and Monongalia Metropolitan Planning Organization's *2016 Metropolitan Transportation Plan Update* (*The MTP*), and concluded that growth in the vicinity of the Project is expected to continue at a similar rate to what has been experienced over the past decade. It is anticipated that available land in the area will continue to be developed regardless of whether this project is constructed or not. Rather than inducing growth, the Project is proposed as a solution to traffic needs that are expected under population and development forecasts for the area. A concerted effort by government and the private sector has occurred over the past decade to plan for growth and redevelopment and protect human and natural environmental resources. Local jurisdictions have plans, ordinances, and commissions in place to effectively manage development and protect natural, cultural, and socioeconomic resources within the Secondary and Cumulative Effects Study Area. Considering the overall scope and nature of the Project, it is not expected to influence land use decisions or induce land use change.

2.0 Demographic Overview

According to the most recent population estimate for West Virginia, the State supports approximately 1,805,832 people (USCB 2018), which is a 0.32% annualized decline and 2.55% overall decline from the population of West Virginia at the 2010 U.S. Census,

1,852,994 (USCB 2010). Despite this recent decline at the state level, the City of Morgantown and Monongalia County have grown over the same timeframe. The Monongalia County population has grown steadily since the 1900s, and in 2018 was its highest ever reported at 106,420. The population of Morgantown has grown since 1990, with a peak population of 30,950 in 2018 (USCB 2018). Population forecasts indicate that Monongalia County will continue to grow and may reach approximately 136,927 by 2035 (State of West Virginia 2015), which would be an annualized growth rate of 1.56%. Approximately 30% of the county's population resides in Morgantown, which will likely experience some level of growth as well.

3.0 Secondary Effects

In order to evaluate the potential for secondary effects as a result of the Project, parcels within 0.5 mile of the Project that hold the potential to be developed in the future were identified using quantitative methods, then qualitatively reviewed for their suitability (e.g., government ownership, slope or other physical constraints, water/sewer availability, local planning goals) for future development. Overall, approximately 450 potentially available parcels were flagged within the Secondary and Cumulative Effects Study Area, totaling 665 acres. The findings from this analysis, as well as a review of local planning documents and existing utilities and infrastructure in the vicinity of the Project, are detailed below.

3.1 Parcel Data Review for Available/Developable Land

The 0.5-mile Secondary and Cumulative Effects Study Area used to evaluate available land includes Morgantown and unincorporated portions of Monongalia County. The parcel data analysis revealed the following properties in the immediate vicinity of Greenbag Road as potential areas for future development (**Figure 1**):

- Several small, commercial properties on the west side of US 119, and others clustered on the north side of Greenbag Road and along Distributor Drive in the vicinity of Mountaineer Mall.
- Four adjacent parcels in the southwest quadrant of the Greenbag Road intersection with Dorsey Avenue/Kingwood Pike, and there are three others in the northwest quadrant of the same intersection.
- Three of the largest tracts identified as developable land (40-80 acres) are contiguous in the southeast quadrant of Greenbag Road and Dorsey Avenue/Kingwood Pike. Two of the parcels are held by the same landowner along with one of the properties noted in the preceding bullet.
- The Haymaker Forest area, including a 22-acre parcel and a cluster of approximately 50 small parcels adjacent to the neighborhood north of East Grove Cemetery and east of Dorsey Avenue. Approximately eight parcels were also identified in the neighborhood south of East Oak Grove Cemetery.
- Parcels on the west side of Greenbag Road north of Lower Aarons Creek Road, all within Monongalia County's jurisdiction.

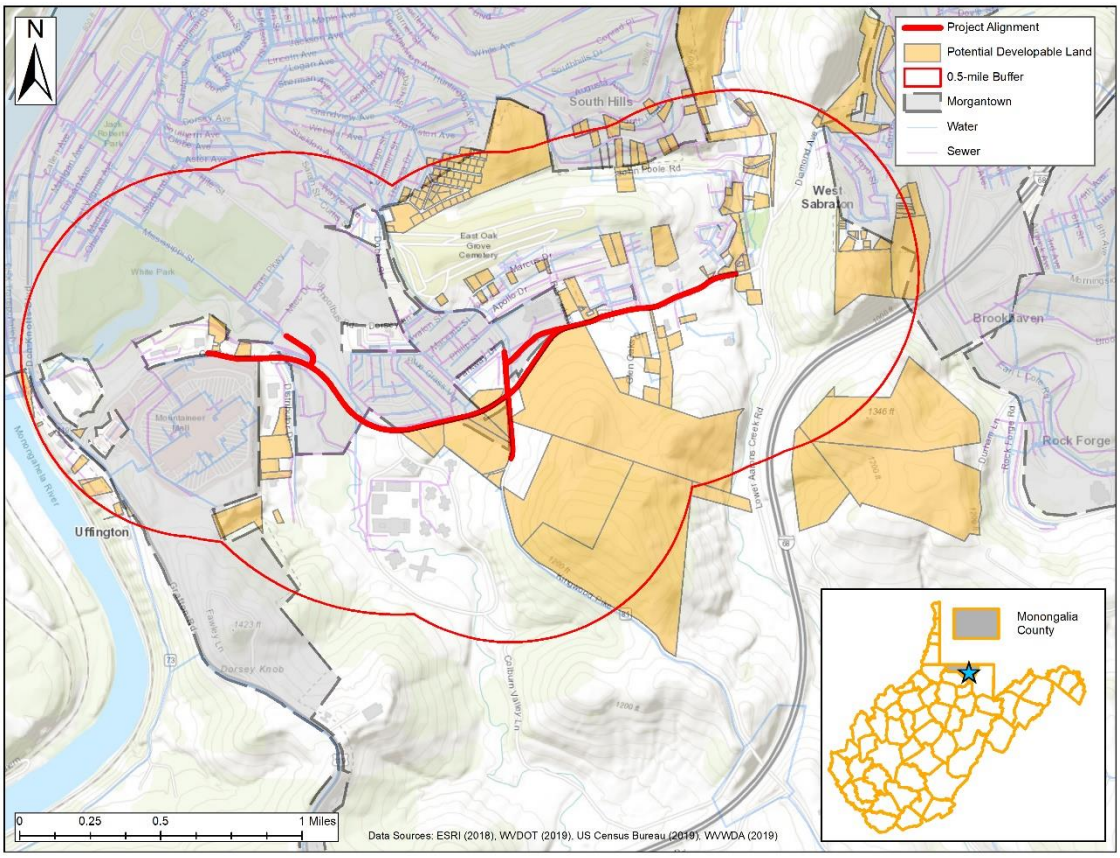


Figure 1: Potential Developable Land

3.2 Local Area Planning Initiatives:

The following information pertaining to development and the vision of the area in the vicinity of the Project was summarized from local planning documents:

The City of Morgantown's Comprehensive Plan (2013):

The *Comprehensive Plan* generally identifies that transportation and land use issues in the area are related to current patterns of development, especially outside of the City of Morgantown. A comparison of the Pattern and Character map, which illustrates existing conditions, and the Land Management map identified the following areas where land use changes may occur in the future as per the City of Morgantown's vision:

1. Mountaineer Mall is identified as a commercial node that is targeted for future infill and redevelopment. This area is also symbolized as an area targeted for encouraged growth in the Conceptual Growth Framework map.
2. "Corridor Enhancement" areas, where development may be improved with a mix of uses, increased intensity at major intersections, and roadway improvements to improve mobility for motorists and multimodal users, are identified at the following locations:

- On either side of US 119, north and south of the Greenbag Road intersection
- North of Mountaineer Mall on either side of Greenbag Road
- Along the entire length of Greenbag Road east of the Dorsey Avenue/Kingwood Pike intersection
- Though outside of the 0.5-mile buffer of the Project, the area along WV-7 (Earl Core Road) north and south of its intersection with Greenbag Road is also identified as a Corridor Enhancement Area. This area is targeted for encouraged growth according to the Conceptual Growth Framework map, and includes Sabraton, a designated "area of opportunity" and gateway to the City from I-68 in *The Comprehensive Plan*. The City of Morgantown envisions continued infill and redevelopment in this region as a mixed-use employment, retail, accommodation, and residential district.

3. Controlled Growth/Traditional Neighborhood Areas where growth is not strongly encouraged but where mixed-use development is possible due to the proximity to major roadways and utilities.
    - South of the terminus of Distributor Drive
    - Just south of Greenbag Road between Dorsey Avenue / Kingwood Pike and Lower Aaron Creek Road.
4. Areas targeted for "Neighborhood Conservation," where the existing character will be retained and where maintenance of buildings and infrastructure will continue, are present within the Secondary and Cumulative Effects Study Area. According to the Conceptual Growth Framework map, infill and redevelopment is likely in all of these areas.
    - At the South Middle School and Monongalia County Technical College complex, and at the City of Morgantown property just east of it.
    - Within the Bluegrass Village development.
    - Along the west side of Dorsey Avenue.
5. The area east of Dorsey Avenue and just north of East Oak Grove Cemetery is classified as a natural area, and the City intends this area to be used as a Reserve in the future. The "Reserve" designation is defined as undeveloped land that will likely remain as open space or agricultural use due to environmental constraints. This forested tract is known locally as Haymaker Forest.

The City of Morgantown has defined a conceptual Urban Growth Boundary (UGB), which encompasses the entire Greenbag Road project corridor. Urban Growth Boundaries designate areas outside the corporate limits of a place where sufficient developable land exists through a 20-year period of growth, and when implemented they encourage infill and redevelopment within the UGB limits. City officials wish to expand the boundaries of the City in order to incorporate areas that exist within the functional boundary of the City

that are not currently encompassed by Morgantown's legal limits, and implementation of a UGB may help facilitate that expansion.

City of Morgantown's Consulting Report Related to the Proposed Expansion of the City's Boundaries Through Annexation of Specified Adjacent Properties (2019):

As noted above, the City of Morgantown has recently been pursuing minor boundary adjustments to incorporate areas that are currently under Monongalia County's jurisdiction. The proposed annexation would expand the City limits to include the following areas in the vicinity of the Greenbag Road project:

1. Tracts on both sides of Greenbag Road, west and north of the mall;
2. Areas surrounding Distributor Drive;
3. Tracts south, north, and east of Bluegrass Village;
4. A tract just west of Dorsey Avenue, and the East Oak Grove Cemetery and Haymaker Forest areas immediately east of it;
5. A large area just north of Greenbag Road and east of the Dorsey Avenue/Kingwood Pike intersection.

Extension of utility services to a property is generally part of city annexation agreements that facilitate acquisitions. Assuming the parcels along Greenbag Road are successfully acquired by the City of Morgantown, it is reasonable to assume that applicable properties will be subject to extensions where services do not already exist.

MMMPO's Morgantown Industrial Park Access Study (2018)

One of the most highly visible business developments in Morgantown, the Morgantown Industrial Park offers direct access to rail and water transportation within a few miles of both I-79 and I-68. Many types of leasing arrangements are available and build-to-suit terms are available based on project specifications, and at least three industrial sites are currently for lease within the park. The Park is expected to expand, and a planning study was completed by the MPO to evaluate alternative access to the Park. Six build alternatives were developed. Two are applicable to the Secondary and Cumulative Effects Study Area – Alternate D (bridge across Mon River), and Alt E – Bridge over the Mon River and connection with Greenbag Road at the US 119 Donn Knotts Boulevard intersection. No endorsement for any alternative was provided as part of this study.

Availability of water/sewer

Water and sewer availability is abundant within the Secondary and Cumulative Effects Study Area in areas that are within the City of Morgantown's jurisdiction. Water and sewer is less available under the County's jurisdiction. Sewer is limited in areas south of Greenbag Road and east of Colburn Valley Lane, including along Kingwood Pike. Water service is limited south of the corridor and east of Kingwood Pike. The Haymaker Forest and East Oak Grove Cemetery area does not have available water and sewer, but services surround this area. Water and sewer services are limited along Lower Aarons

Creek Road, especially to the east. The areas within the Secondary and Cumulative Effects Study Area with the most limited availability of water and sewer are not identified as proposed areas of expansion under Morgantown's annexation plan.

4.0 Cumulative Effects

While the Project improvements on their own may only result in minor impacts to the notable cultural, community, water quality, natural features, and habitat within the study area, they may contribute to other effects that have resulted from past actions, and/or to impacts that will occur from future planned actions. In order to evaluate the potential for, magnitude of, and interactions between these cumulative effects, past projects since 1989 and planned actions through the year 2045 were identified and evaluated qualitatively. Information was primarily sourced from local planning documents, study area field views, and a review of aerial imagery. Cumulative effects are challenging to quantify since the magnitude of any impact associated with a proposed action is subjective. At times, both positive and negative impacts to a single resource are possible, or negative impacts to one resource may be offset by a positive impact to another.

4.1 Past Projects

As previously discussed, the populations of Morgantown and Monongalia County have grown over the past decade despite a decline in population across the State of West Virginia, and land use along the Greenbag Road corridor has experienced development in response to this growth. A comparison of historical aerial imagery and field view observations have identified the following areas where expansion has occurred since the late 1980s (areas denoted with an asterisk indicate that some level of development has occurred within the last 15 years):

1. Small commercial properties west of US 119.*
2. The existing automotive dealer north of the Greenbag Road intersection with US 119 expanded.
3. The commercial corridor north of Greenbag Road, near Mountaineer Mall.
4. Expansion of the facilities at South Middle School and Monongalia County Technical Education Center.*
5. Extension of Distributor Drive and development at the end and on either side of the roadway.*
6. The Morgantown Utility Board's paved driveway was constructed, and the facilities in this area expanded.
7. New facilities were constructed within the Federal Correctional Institution.
8. Construction of Bluegrass Village.
9. The existing gymnastics center, storage facility, insurance agency, and other buildings in the northwest quadrant of Greenbag Road and Dorsey Avenue/Kingwood Pike were constructed.
10. Construction of Mountainview Elementary.
11. Numerous single family and multifamily residences along Marcus Drive.

12. Many facilities and access streets to these resources on the north side of Greenbag Road, east of Luckey Lane, serving residential (e.g., Ashworth Lane, Jonathan Lane, Long Branch Drive) and commercial uses.*
13. Glen Oaks Drive, south of the corridor, and residences accessed by that road.
14. Harvest Family Worship Center, Covenant Christian School, and the paved access road to these resources.
15. Numerous commercial facilities surrounding Greenbag Road north of Lower Aarons Creek Road.
16. Residential areas along South Point Circle.*

The development that has occurred within and around Morgantown over the past 15 years is expected to continue at a similar pace in the future, and it is anticipated that available land in the area will continue to be developed regardless of if this project is constructed or not.

4.2 Reasonably Foreseeable Future Actions (RFFAs)

In addition to past actions, potential cumulative effects of a proposed action were aggregated with other ongoing and reasonably foreseeable future actions (RFFAs). The identification of RFFAs is complicated by the fact that future actions are not always foreseeable, that planned actions are contingent upon funding security and/or preliminary planning actions, by the economic and political climates of the area, and by many other factors that can be impossible to predict.

Actions that may contribute to cumulative effects are shown in Table 1 below.

Table 1

Activity	Location	Environmental Issues that are Cumulative
Multimodal facility improvements	Sidewalks along Dorsey Avenue, White Park/Caperton Trail Connection	Land use, terrestrial habitat, wetlands, streams, water quality, traffic
Water and sewer enhancements	Areas currently under Monongalia County's jurisdiction that are proposed for annexation into Morgantown: o Tracts on both sides of Greenbag Road, west and north of the mall; o Areas surrounding Distributor Drive; o Tracts south, north, and east of Bluegrass Village; o A tract just west of Dorsey Avenue, and the East Oak Grove Cemetery and Haymaker Forest areas immediately east of it; o A large area just north of Greenbag Road and east of the Dorsey Avenue/Kingwood Pike intersection.	Land use, water quality, wetlands, streams, traffic, noise, air quality, cultural resources
Transportation system improvements	Mississippi Street; WV-7 (Earl Core Road, including intersection with Greenbag Road; US 119 (Grafton Road); Smithtown Road	Land use, terrestrial habitat, water quality, wetlands, streams, traffic, noise, air quality, cultural resources
Residential and/or commercial development	Planned townhomes east of Dorsey Avenue, north of Haymaker Forest (West Virginia Metro News 2019). Other potential areas for future development include areas near the US 119 and Greenbag Road intersection, the region in the southeast quadrant of Greenbag Road and Dorsey Avenue/Kingwood Pike intersection, and the Greenbag Road corridor north of Lower Aarons Creek Road through and including its intersection with WV-7.	Land use, terrestrial habitat, water quality, wetlands, streams, noise, air quality, traffic, cultural resources.

Using the identified RFFAs, a matrix was developed to indicate the likely time period, the importance, the likelihood of occurrence, and potential impacts to natural, social, and cultural resources for each. This method follows procedures developed by the USACE and is recognized by the CEQ as a valid procedure for estimating cumulative effects (CEQ 1997). The results of the analysis are shown in Table 2.

Table 2

	Time Period	Importance	Occurrence Probability	Water Quality	Wetlands	Terrestrial Habitat	RTE Species	Air Quality	Recreation Resources	Socioeconomics	Cultural Resources
Multimodal facility improvements	1,2	M	M	+/-	+/-	+/-	+/-	+/-	+	+	+/-
Water and sewer enhancements	1,2	M	H	+	+	+/-	+/-	+/-	+	+	+/-
Transportation system improvements	1,2	H	H	+/-	+/-	+/-	+/-	+/-	+	+	+/-
Residential and/or commercial development	1,2	L	M	+/-	+/-	+/-	+/-	+/-	+	+	+/-
Regulatory Environment	1,2	H	M	+	+	+	+	+	+	+	+

Time period: 1 = within 10 years, 2 = between 10 and 20 years from now
Importance/Occurrence probability: H = high, M = medium, L = low.
Impacts: + = positive. - = negative, +/- = mixed effects, 0 = none.

Any proposed development, whether it is transportation or utility-oriented, multimodal facility improvements, residential, or commercial in nature, can result in negative impacts to water quality, wetlands, streams, habitat, wildlife, and/or cultural resources. There is risk of physical adverse impacts associated with any temporary or permanent ground disturbance, and any increase in impervious surface can result in impaired water quality which could translate to adverse impacts to aquatic habitat and wildlife. Construction activities in the short-term can also create negative impacts to air quality. At the same time, construction and development activity generally occurs with an intent to avoid, minimize, and/or mitigate any adverse impacts to natural or cultural resources. This can result in new water or habitat features that could offset negative impacts, as well as potential for improved understanding of the status of threatened, rare, and endangered species. These projects may also provide opportunities for enhanced coordination between resource agencies and other stakeholders that may not have otherwise occurred, potentially resulting in improved management of the function and values of these natural and cultural resources at a broader level.

The physical ground disturbance that can be associated with multimodal facility improvements can result in mixed impacts to natural and cultural resources as described above. However, the overall impacts of such improvements would likely be positive. Recreational resources would improve, especially since planned actions described in the *Comprehensive Plan* and *The MTP* identify multimodal facilities improvements that would create direct connections between parks, schools, and cultural resources. Air quality would improve if the availability of multimodal facilities cause motorists to opt for active forms of transportation instead of vehicles. Any reduced congestion that might result from that shift would improve air quality. Socioeconomic conditions may improve if the

multimodal facility improvements enhance access between residential areas and employment or commercial opportunities.

Besides the previously described mixed impacts to natural and cultural resources, water and sewer enhancements would result in a positive impact to water quality, recreational resources, and socioeconomics. Sewer systems that are designed to an appropriate capacity are less likely to fail. This impact would therefore offset any negative impact the disturbance would cause to water quality. The presence of adequate utilities is also essential for the health, well-being, and attractiveness of a community. The availability of adequate services increases the likelihood for development and creates a desirable area to live and work in, which would in turn result in a positive effect on the socioeconomics of an area.

Transportation system improvements that are described in the local planning documents generally propose widening and/or new access facilities, construction of which would likely result in mixed impacts to natural and cultural resources as described previously. If these improvements result in overall travel time savings and/or reduced congestion, they could also contribute to air quality improvements over time due to reduced emissions sourced from motorized vehicles. There is potential for mixed access impacts to recreational, socioeconomic, and/or residential areas, since even at the individual project level different areas can experience positive or negative access impacts.

The mixed impacts associated with the construction of new commercial and/or residential areas could be offset by any positive socioeconomic impacts that occur as a result of these developments. These actions may also result in negative impacts to notable resources if population increases result, causing a rise in demand for transportation facilities and recreational, cultural, and community resources.

The regulatory environment is expected to result in a positive impact to water quality, wetlands, streams, terrestrial habitat, wildlife, air quality, recreational resources, socioeconomics, and cultural resources. Federal, state, and local regulations are in place to protect natural, cultural, and socioeconomic resources. Although cumulative effects associated with the development are possible as described above, the City of Morgantown has demonstrated planning and policy initiatives over the past decade to preserve and protect important resources under its jurisdiction from pressures associated with growth and development. Several examples of these efforts are listed below:

1. The City has a conceptual urban growth boundary identified in the *Comprehensive Plan*, as well as identified areas for targeted growth.
2. The City's Urban Landscape Commission promotes an aesthetically attractive environment, plan the urban landscape, provide development recommendations, and encourage a healthy urban forest.

3. The City has an established Land Preservation Program and a Land Reuse and Preservation Agency to oversee responsible land preservation activities within and adjacent to the City boundaries.
4. The City's Stormwater Utility Board manages stormwater pollution
5. Water supply plans for certain developments under the City's Planning and Zoning Code.
6. The City has an established Historic Landmarks Commission to advise the designation and encourage the preservation of historic structures and districts.

5.0 Conclusion

The combined effects of this project when considered in the context of other past, present, and future actions, and the resulting impacts on the human and natural features within the Secondary and Cumulative Effects Study Area, will likely minimally contribute to cumulative effects to environmental resources in the Secondary and Cumulative Effects Study Area. Direct impacts by WVDOH projects will be addressed by avoidance, minimization, or mitigation consistent with programmatic agreements with the respective resource agencies during the permitting process. All developments will be required to follow local, state, and federal guidelines and permitting regulations.

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Appendix B: Traffic Study Reports

STAHL SHEAFFER ENGINEERING

REPORT

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Southpointe, PA • 724-960-1111
Selinsgrove, PA • 570-374-4813
Monroeville, PA • 412-229-8583
Washington, PA (Lab) • 724-206-9862
North Canton, OH • 330-794-5490
Morgantown, WV • 304-381-4281
Ravenswood, WV • 304-532-5401
Charleston, WV • 681-265-3842

www.sse-llc.com

Greenbag Road (CR 857) Preliminary Investigation and Engineering Traffic Study



Prepared for:

West Virginia
Department of Transportation
Division of Highways

Submitted by:

STAHL SHEAFFER ENGINEERING

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1. Introduction

1.1 General Overview of the Project

Greenbag Road (CR 857) is minor arterial, two-lane facility, that provides an east-west connection in southern Morgantown, linking Don Knotts Boulevard (US 119) and Earl L Core Road (WV 7). The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delay during the peak hours, and increased volume of truck traffic and development traffic within the corridor. Several studies have been previously completed through the Morgantown Monongalia Metropolitan Planning Organization (MMMPO), evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility.

Stahl Sheaffer Engineering, LLC (Stahl Sheaffer) was retained to complete a traffic study of the Greenbag Road corridor to evaluate the existing operation of the selected study intersections within the corridor and to evaluate potential future intersection improvement alternatives at these selected study intersections. The Greenbag Road corridor study area is presented in Figure 1.

Based on the outcome of the MMMPO's preliminary studies and findings, two (2) roadway alternatives were selected to be examined by Stahl Sheaffer:

1. Two (2) eleven (11) foot travel lanes with a fourteen (14) foot wide center turn lane and four (4) foot wide shoulders with curb and sidewalks/multi-use path from the beginning of the project (west of Mississippi Avenue) to the Bluegrass Village Mobile Home Park.

2. Two (2) twelve (12) foot travel lanes and four (4) foot wide shoulders from Bluegrass Village Mobile Home Park to the end of the project (north of Diamond Avenue).

In addition, several potential intersection improvement options were selected to be examined as part of this study. These intersection improvement options include:

<u>Greenbag Road and Mississippi Avenue</u>

- Option 1: Exclusive eastbound left turn lane on Greenbag Road and maintaining existing unsignalized operation.
- Option 1A: Exclusive eastbound left turn lane on Greenbag Road, widening Mississippi Avenue to provide a two (2) lane approach, and maintaining existing unsignalized operation.
- Option 2: A single-lane roundabout with roadway improvements, including an exclusive westbound by-pass right turn lane.
- Option 3: Installation of a traffic signal with roadway improvements, including an exclusive eastbound left turn lane and an exclusive westbound right turn lane on Greenbag Road, and widening Mississippi Avenue to provide a two (2) lane approach.
- Option 3A: Installation of a traffic signal, operation as a continuous green T-intersection, with roadway improvements, including an exclusive eastbound left turn lane and an exclusive westbound right turn lane on Greenbag Road, and widening Mississippi Avenue to provide a two (2) lane approach.

<u>Greenbag Road and Dorsey Avenue/Kingwood Pike (CR 81)</u>

- Option 1: Exclusive left turn lanes on Greenbag Road and upgrading traffic signal operation to three (3)-phases.

- Option 2: A two-lane roundabout with roadway improvements, including exclusive left turn lanes on Greenbag Road.
- Option 3: Left turn lanes on all approaches and upgrading traffic signal operation to four (4)-phases.
- Plus, evaluation of all three (3) options above incorporating diverted traffic from a potential termination of Luckey Lane at Greenbag Road.

Greenbag Road and Luckey Lane

- Option 1: Twelve (12) foot travel lanes on Greenbag Road.
- Termination of Luckey Lane at Greenbag Road, with proposed Luckey Lane connection to Richard Avenue.

Greenbag Road (CR 857) and Richard Avenue

- Option 1: Twelve (12) foot travel lanes on Greenbag Road.
- Option 2: Evaluation of intersection incorporating diverted traffic from a potential termination of Luckey Lane at Greenbag Road.

Greenbag Road and Lower Aarons Creek Road (CR 64)

- Option 1: Exclusive south-westbound left turn lane on Greenbag Road.
- Option 2: Twelve (12) foot travel lanes on Greenbag Road.
- Option 3: Defined Commercial Driveway as fourth leg to the intersection on the northwest quadrant of the intersection.

Greenbag Road and Diamond Avenue

- Option 1: Twelve (12) foot travel lanes on Greenbag Road.
- Option 2: Warranted turn lane(s) on Greenbag Road.
- Option 3: Installation of a traffic signal.

The results of this study will be used to guide intersection and roadway improvements associated with potential improvements projects to the corridor.

2. Study Area

2.1 List of Study Intersections

In accordance with a scope of study developed for the Greenbag Road (CR 857) Preliminary Investigation and Engineering Traffic Study, the following intersections were selected for study:

- Greenbag Road and Mississippi Avenue
- Greenbag Road and Dorsey Avenue/Kingwood Pike (CR 81)
- Greenbag Road and Luckey Lane
- Greenbag Road and Richard Avenue
- Greenbag Road and Lower Aarons Creek Road (CR 64)
- Greenbag Road and Diamond Avenue

The study intersections selected for analysis are presented in Figure 2 and further described under the Project Corridor Section of the report.

2.2 Existing Roadway System

A field reconnaissance of the study area was conducted to obtain information on roadway widths, roadway grades, lane configurations, traffic control and posted speed limits within the environs of each study intersection. The following provides a description of the study roadways.

Project Corridor

Greenbag Road (CR 857)

Within the study area, Greenbag Road (CR 857) is minor arterial, two-lane facility, that provides an east-west connection in southern Morgantown, linking Don Knotts Boulevard (US 119) and Earl L Core Road (WV 7). Greenbag Road, consisting of one (1) lane of travel in either the eastbound and westbound direction, with an average travel lane width varying between approximately 9 feet to 11 feet. The posted speed limit on Greenbag Road is 40 miles per hour (mph) in the study area.

<u>At Mississippi Avenue Intersection</u>

At its intersection with Mississippi Avenue, the eastbound Greenbag Road approach provides one (1) lane of travel for the shared left turn/through movements and westbound Greenbag Road approach provides one (1) lane of travel for the shared through/right turn movements. This intersection operates as a two-way stop controlled intersection with a stop sign on the minor street, Mississippi Avenue, approach and is free-flowing on the major street, Greenbag Road.

<u>At Dorsey Avenue/Kingwood Pike (CR 81) Intersection</u>

At its intersection with Dorsey Avenue/Kingwood Pike, both the eastbound and westbound Greenbag Road approaches to Dorsey Avenue/Kingwood Pike provides one (1) travel lane for the shared left turn/through/right turn movements. The intersection is controlled by a two-phased, uncoordinated, fully-actuated traffic signal, which provides an eastbound/westbound phase and a northbound/southbound phase. The traffic signal is currently operating at a 92

second cycle length, providing 51 seconds for the eastbound/westbound Greenbag Road approaches and 41 seconds for the northbound/southbound Dorsey Avenue/Kingwood Pike approaches during the peak hours studied.

At Luckey Lane Intersection

At its intersection with Luckey Lane, the eastbound Greenbag Road approach provides one (1) lane of travel for the shared left turn/through movements and westbound Greenbag Road provides one (1) lane of travel for the shared through/right turn movements. This intersection operates as a two-way stop controlled intersection with a stop sign on the minor street, Luckey Lane, approach and is free-flowing on the major street, Greenbag Road. This intersection is located approximately 125 feet west of the intersection of Greenbag Road and Richard Avenue.

At Richard Avenue Intersection

At its intersection with Richard Avenue, the eastbound Greenbag Road approach provides one (1) lane of travel for the shared left turn/through movements and westbound Greenbag Road provides one (1) lane of travel for the shared through/right turn movements. This intersection operates as a two-way stop controlled intersection with a stop sign on the minor street, Richard Avenue, approach and is free-flowing on the major street, Greenbag Road. This intersection is located approximately 125 feet east of the intersection of Greenbag Road and Richard Avenue.

At Lower Aarons Creek Road (CR 64) Intersection

At its intersection with Lower Aarons Creek Road, the north-eastbound Greenbag Road provides one (1) lane of travel for the shared through/right turn movements and south-westbound Greenbag Road provides one (1) lane of travel of the shared left turn/through movements. Lower Aarons Creek Road intersects Greenbag Road as the intersections third leg, providing travel to/from the south. An existing commercial development is located north of the Greenbag Road/Lower Aarons Creek Road intersection. This development provides an open, non-delineated, access to the businesses parking area with no traffic control. The intersection currently operates as a two-way stop controlled intersection with a stop sign on the minor street, Lower Aarons Creek Road, approach and is free-flow on the major street, Greenbag Road (CR 857).

At Diamond Avenue Intersection

At its intersection with Diamond Avenue, the northbound Greenbag Road approach provides one (1) lane of travel for the shared through/right turn movement and southbound Greenbag Road approach provides one (1) lane of travel for the shared left turn/through movement. This intersection operates as a two-way stop controlled intersection with a stop sign on the minor street, Diamond Avenue, approach and is free-flowing on the major street, Greenbag Road.

Other Roadways

Mississippi Avenue

Within the study area, Mississippi Avenue is a collector roadway, consisting of one (1) lane of travel in both the northbound and southbound directions through the City of Morgantown. At its intersection with Greenbag Road, southbound Mississippi Avenue provides one (1) lane of travel for the shared left turn/right turn movements. The intersection operates as a two-way stop controlled intersection with a stop sign on the southbound Mississippi Avenue approach. There is no posted speed limit on Mississippi Avenue, within the vicinity of the study intersection.

Dorsey Avenue/Kingwood Pike (CR 81)

Within the study area, Dorsey Avenue and Kingwood Pike are minor arterial roadways, consisting of one (1) lane of travel in both the northbound and southbound travel directions. At its intersection with Greenbag Road, the southbound Dorsey Avenue approach provides one (1) lane of travel for the shared left turn/through/right turn movements. The northbound Kingwood Pike approach provides one (1) lane of travel for the shared left turn/through/right turn lane movements. The intersection is controlled by a two-phased, uncoordinated, fully-actuated traffic signal, which provides an eastbound/westbound phase and a northbound/southbound phase. The traffic signal is currently operating at a 92 second cycle length, providing 51 seconds for the eastbound/westbound Greenbag Road approaches and 41 seconds for the northbound/southbound Dorsey Avenue/Kingwood Pike approaches during the peak hours studied. The posted speed limit on Dorsey Avenue is 35 mph and the posted speed limit on Kingwood Pike is 45 mph within the study area.

Luckey Lane

Within the study area, Luckey Lane is a local roadway that provides one (1) lane of travel in both the eastbound and westbound direction, linking Greenbag Road and Dorsey Avenue, and by-passing the signalized intersection of Greenbag Road with Dorsey Avenue/Kingwood Pike. At its intersection with Greenbag Road, the south-eastbound Luckey Lane approach provides one (1) lane of travel for the shared left turn/right turn movements. There is no delineated traffic control at this intersection, a stop sign is not provided on the southbound Luckey Lane approach. The eastbound and westbound Greenbag Road approaches operate as free-flowing. The posted speed limit on Luckey Lane is 15 mph within the study area.

Richard Avenue

Within the study area, Richard Avenue is a local roadway that provides one (1) lane of travel in both the northbound and southbound direction. At its intersection with Greenbag Road, the southbound Richard Avenue approach provides one (1) lane of travel for the shared left turn/right turn movements. The intersection operates as a two-way stop controlled intersection with a stop sign on the southbound Richard Avenue approach. There is no posted speed limit on Richard Avenue, within the vicinity of the study intersection.

Lower Aarons Creek Road (CR 64)

Within the study area, Lower Aarons Creek Road is a local two-lane roadway that provides one (1) lane of travel in both the northbound and southbound direction. At its intersection with Greenbag Road (CR 857), the northbound Lower Aarons Creek Road approach provides one (1) lane of travel for the shared left turn/right turn movements. The intersection operates as a two-way stop controlled intersection with a stop sign on the northbound Lower Aarons Creek Road approach. There is no posted speed limit on Lower Aarons Creek Road, within the vicinity of the study intersection.

Diamond Avenue

Within the study area, Diamond Avenue is a local two-lane roadway that provides one (1) lane of travel in both the northbound and southbound direction, linking Greenbag Road and Earl L Core Road (WV 7). At its intersection with Greenbag Road (CR 857), the westbound Diamond Avenue approach provides one (1) lane of travel for the shared left turn/right turn movements. The intersection operates as a two-way stop controlled intersection with a stop sign on the westbound Diamond Avenue approach. The posted speed limit on Diamond Avenue is 35 mph within the vicinity of the study intersection.

In addition, field observations determined that there are minimal multi-modal accommodations provided along Greenbag Road (CR 857) and the study intersections.

Field notes for the study intersections, the signal plan and signal timing field notes for the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike, and photographs of the study intersection approaches are included in the Appendix A to this report.

3. Data Collection

3.1 Turning Movement Counts

Manual turning movement counts were performed by Tri State Traffic Data, a traffic data collection firm, at each of the study intersections from 7:00 AM to 9:00 AM and from 3:00 PM to 6:00 PM on Tuesday, October 2, 2018 and Tuesday, October 23, 2018, and on Saturday, September 29, 2018 from 11:00 AM to 2:00 PM. These turning movement counts were utilized to determine the existing 2018 Weekday AM, Weekday PM, and Saturday peak hour traffic volumes at each study intersection, as presented on Figure 3. The existing peak hour traffic volumes along Greenbag Road (CR 857), between Dorsey Avenue/Kingwood Pike and Richard Lane were balanced, due to their relative closeness.

In addition, manual turning movement counts were performed by Tri State Traffic Data at the intersection of Greenbag Road and Mississippi Avenue from 7:00 AM to 7:00 PM on Thursday, January 17, 2019. The twelve (12) hour turning movement count data was collected to be utilized for the evaluation of turn lane warrants and signal warrants, as described in Section 9 and Section 10 of the study, respectively.

Copies of the turning movement count data and traffic volume calculation spreadsheets are included in the Appendix B to this report.

3.2 Automatic Traffic Recorder Counts

Automatic traffic recorder (ATR) counts were conducted along Greenbag Road to obtain existing weekday daily and Saturday daily traffic volumes, vehicle classifications, and 85th percentile speeds. The average weekday and Saturday volumes, percent heavy vehicles, and 85th percentile speeds are summarized in the following table.

ATR Summary

ATR Count Location	Dates	Direction of Travel	Average Weekday Daily		Saturday Daily		85th Percentile Speed (mph)
			Traffic Volumes (vpd)	Percent Heavy Vehicles (%)	Traffic Volumes (vpd)	Percent Heavy Vehicles (%)	
Greenbag Road, West of Mississippi Avenue	9/29-10/4/18	Eastbound	5,544 vpd	9.88 %	3,546 vpd	3.75 %	44 mph
		Westbound	5,583 vpd	14.08 %	3,339 vpd	5.71 %	45 mph
Greenbag Road, West of Dorsey Ave/Kingwood Pike	10/20-10/31/18	Eastbound	5,344 vpd	12.59 %	3,499 vpd	8.95 %	48 mph
		Westbound	5,414 vpd	13.67 %	3,418 vpd	6.14 %	47 mph
Greenbag Road, East of Dorsey Ave/Kingwood Pike	9/29-10/4/18	Eastbound	4,876 vpd	8.65 %	3,042 vpd	4.50 %	44 mph
		Westbound	4,357 vpd	8.49 %	2,685 vpd	3.46 %	43 mph
Greenbag Road, West of Lower Aarons Creek Road	9/29-10/4/18	Eastbound	5,141 vpd	7.86 %	3,200 vpd	3.81 %	39 mph
		Westbound	5,405 vpd	6.49 %	3,403 vpd	2.94 %	39 mph
Greenbag Road, West of Lower Aarons Creek Road	9/29-10/4/18	Northbound	4,786 vpd	6.69 %	3,027 vpd	2.81 %	39 mph
		Southbound	4,539 vpd	12.14 %	2,784 vpd	9.20 %	51 mph

The average weekday and Saturday daily traffic volumes from the automatic traffic recorder counts are presented on Figure 4. ATR count data and spreadsheets are provided in Appendix C to this report.

4. Existing Conditions Intersection Analyses

4.1 Existing Capacity Analysis

Capacity analyses were performed for the existing study intersections for the 2018 traffic volumes and conditions for the Weekday AM, Weekday PM, and Saturday peak hours using Synchro software-based methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board (HCM 2010). This methodology determined how well an intersection, approach to an intersection, or movement at an intersection operates, and assigns to it a level of service (LOS) A through F, with LOS A representing the best operating conditions and LOS F, the worst. Detailed definitions of LOS have been included in Appendix D to this report.

The results of the capacity calculations performed for the 2018 existing traffic volumes are summarized in Table 1 for the Weekday AM, Weekday PM, and Saturday peak hours. The 2018 existing conditions capacity analyses revealed that all movements, approaches, and overall intersection levels of service currently operate at a level of service D or better, except for the following:

- Greenbag Road (CR 857) and Mississippi Avenue
  - Southbound Mississippi Avenue approach, shared left turn/right turn movement, is forecasted to operate at a LOS F (109.7 seconds of delay) during the Weekday AM peak hour.

Synchro HCM 2010 capacity analysis printouts for the 2018 existing conditions are included in the Appendix E to this report.

4.2 Existing Queue Analysis

Traffic volumes at each of the study intersections on Greenbag Road were used to perform queuing analyses for the 2018 existing conditions Weekday AM, Weekday PM, and Saturday peak hours. Synchro was utilized for the 2018 existing conditions queue analyses and the Synchro HCM 2010 95th percentile queue lengths are summarized in Table 2. No queues at the study intersections are shown to obstruct adjacent intersections.

Synchro HCM 2010 95th percentile queue analysis printouts for the 2018 existing conditions are included in the Appendix E to this report.

5. 2048 Design Year Traffic Conditions

5.1 Forecasted Traffic Growth

Accurate traffic volume estimations for roadway improvements are critical to allow for the appropriate design of potential geometric features and traffic control devises. Traffic analysis completed to determine roadway improvements are normally based on volumes of traffic projected to a "design" year. For purposes of the Greenbag Road PIE Traffic Study, a 30-year design year was selected, year 2048. Forecasted 2048 design year traffic volumes for each of the peak hours analyzed were determined by applying a background growth rate obtained from the MMMPO. According the MMMPO, this section of Morgantown is forecasted to experience a background traffic growth rate of 1.16 percent per year, linear. This background growth rate was applied to the existing 2018 peak hour traffic volumes (Figure 3) to derive the forecasted 2048 design year traffic conditions. The resultant 2048 design year peak hour traffic volumes are presented on Figure 5.

5.2 Luckey Lane Termination at Greenbag Road – Traffic Diversions

During preparation and analysis of the Greenbag Road corridor, it was determined that there is potential for Luckey Lane to be terminated at its existing intersection of Greenbag Road and relocated to intersect along Richard Avenue. This termination would result in a shift of traffic that once utilized Luckey Lane to travel between Greenbag Road and Dorsey Avenue. The forecasted 2048 design year peak hour traffic volumes to be rerouted due to Luckey Lanes potential termination at Greenbag Road, and relocated to intersect at Richard Avenue, is presented in Figure 6.

As shown in Figure 6, the intersections of Greenbag Road with Richard Avenue and Greenbag Road with Dorsey Avenue/Kingwood Pike are anticipated to be impacted by this diversion. Therefore, year 2048 design year conditions at these intersections were analyzed for both conditions, with and without Luckey Lane intersection to Greenbag Road. The forecasted 2048 design year peak hour traffic volumes with Luckey Lane's termination to Greenbag Road were determined by applying the rerouted Luckey Lane peak hour traffic (Figure 6) to the forecasted 2048 design year peak hour traffic volumes (Figure 5). The resultant forecasted 2048 design year peak hour traffic volumes with rerouted Luckey Lane traffic is presented in Figure 7.

Traffic volume development spreadsheets are included in Appendix F to this report.

6. 2048 Design Year Conditions Intersection Analyses Without Improvement Options

6.1 2048 Design Year Conditions Without Improvements Capacity Analyses

Capacity calculations were performed for the study intersection for the 2048 design year peak hour traffic volumes, without improvements (Figure 5), for the Weekday AM, Weekday PM, and Saturday peak hours. These analyses assumed existing lane configurations and operation at the study intersections. The results of the capacity calculations performed for the 2048 design year peak hour traffic volumes, without improvements, are summarized in Table 3 for the Weekday AM, Weekday PM, and Saturday peak hours.

The 2048 design year conditions, without improvements, capacity analyses revealed that all movements, approaches, and overall intersection levels of service currently operate at a level of service D or better, except for the following:

- Greenbag Road (CR 857) and Mississippi Avenue
  - Southbound Mississippi Avenue approach, shared left turn/right turn movement, is forecasted to operate at a LOS F (826.4 seconds of delay) during the Weekday AM peak hour and a LOS F (330.1 seconds of delay) during the Weekday PM peak hour.
  - The overall intersection is forecasted to operate at a LOS F (154.5 seconds of delay) during the Weekday AM peak hour.

- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)
  - Eastbound Greenbag Road approach, shared left turn/through/right turn, is forecasted to operate at a LOS F (246.9 seconds of delay) during the Weekday PM peak hour.
  - Westbound Greenbag Road approach, shared left turn/through/right turn, is forecasted to operate at a LOS E (72.9 seconds of delay) during the Weekday PM peak hour.
  - Northbound Kingwood Pike approach, shared left turn/through/right turn, is forecasted to operate at a LOS E (79.7 seconds of delay) during the Weekday AM peak hour.
  - The overall intersection is forecasted to operate at a LOS F (129.1 seconds of delay) during the Weekday PM peak hour.

- Greenbag Road (CR 857) and Luckey Lane
  - Southbound Luckey Lane approach, shared left turn/right turn movement, is forecasted to operate at a LOS F (52.3 seconds of delay) during the Weekday AM peak hour and a LOS E (43.5 seconds of delay) during the Weekday PM peak hour.

- Greenbag Road (CR 857) and Richard Avenue
  - Southbound Richard Avenue approach, shared left turn/right turn movement, is forecasted to operate at a LOS E (40.8 seconds of delay) during the Weekday AM peak hour.

Synchro HCM 2010 capacity analysis printouts for the 2048 design year conditions, without improvements, are included in the Appendix G to this report.

6.2 2048 Design Year Conditions Without Improvements Queue Analyses

Traffic volumes at each of the study intersections on Greenbag Road were used to perform queuing analyses for the 2048 design year conditions, without improvements, for the Weekday AM, Weekday PM, and Saturday peak hours. Synchro was utilized for the 2048 design year conditions, without improvements, queue analysis and the Synchro HCM 2010 95th percentile queue length is summarized in Table 4. Based on the results of the queue analysis, the following intersection movements are forecasted to queue through and obstruct adjacent intersections.

- Greenbag Road (CR 857) and Mississippi Avenue
  - Southbound Mississippi Avenue approach queue is forecasted to extend back through the intersection of M Tec Drive during the Weekday AM peak hour.

- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike
  - Eastbound Greenbag Road approach queue is forecasted to extend back through the intersection of Bluegrass Village Driveway during the Weekday PM peak hour.
  - Southbound Dorsey Avenue approach queue is forecasted to extend back through the intersection of Luckey Lane during the Weekday PM peak hour.

Synchro HCM 2010 95th percentile queue analysis printouts for the 2018 existing conditions are included in the Appendix G to this report.

7. Roadway and Intersection Improvement Options

Based on the outcome of the MMMPO's preliminary studies and findings, two (2) roadway alternatives were selected to be examined:

1. Two (2) eleven (11) foot travel lanes with a fourteen (14) foot wide center turn lane and four (4) foot wide shoulders with curb and sidewalks/multi-use path from the beginning of the project (west of Mississippi Avenue) to the Bluegrass Village Mobile Home Park.

2. Two (2) twelve (12) foot travel lanes and four (4) foot wide shoulders from Bluegrass Village Mobile Home Park to the end of the project (north of Diamond Avenue).

In addition, several potential intersection improvement options were selected to be examined as part of this study. Details of each improvement option per study intersection are summarized below.

7.1 Greenbag Road (CR 857) and Mississippi Avenue

Option 1: Eastbound Left Turn Lane on Greenbag Road

- Includes installation of an exclusive eastbound left turn lane on Greenbag Road.
- The Mississippi Avenue approach and proposed intersection operation will remain the same as existing conditions.

Option 1A: Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach

- Includes installation of an exclusive eastbound left turn lane on Greenbag Road.
- Includes widening southbound Mississippi Avenue approach to provide two (2) lanes, an exclusive left turn lane and an exclusive right turn lane.
- Intersection operation will remain the same as existing conditions.

Option 2: Single-Lane Roundabout

- Includes a single lane roundabout, with an inscribed circle diameter of 130 feet, with a 25-foot circulatory roadway width, providing a travel lane and truck apron.
- The eastbound Greenbag Road approach provides one (1) lane for the shared left turn/through movement.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive through and an exclusive right turn by-pass lane. The exclusive right turn by-pass lane traffic does not enter the roundabout and operates as a yield controlled channelized right turn lane at its intersection with Mississippi Avenue.
- The southbound Mississippi Avenue approach provides one (1) lane for the shared left turn/through movement.

Option 3: Traffic Signal and Roadway Improvements

- Includes installation of a three (3) phased traffic signal, with a protected/permissive eastbound left turn phase, a permissive eastbound/westbound phase, and a protected southbound phase.
- The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and an exclusive through lane.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive through lane and an exclusive right turn lane.
- The southbound Mississippi Avenue approach provides two (2) lanes, an exclusive left turn lane and an exclusive right turn lane.

Option 3A: Continuous Green T-Intersection Traffic Signal and Roadway Improvements

- Includes installation of a three (3) phased traffic signal, with a protected/permissive eastbound left turn phase, a permissive westbound phase, and a protected southbound phase. The eastbound through movement traverses the intersection via a delineated lane, which provides a protected continuous green through the intersection.
- The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and an exclusive through lane.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive through lane and an exclusive right turn lane.
- The southbound Mississippi Avenue approach provides two (2) lanes, an exclusive left turn lane and an exclusive right turn lane.

7.2 Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)

Option 1: Exclusive Left Turn Lanes on Greenbag Road

- Includes installation of an exclusive eastbound left turn lane on Greenbag Road.
- Includes installation of an exclusive westbound left turn lane on Greenbag Road.
- Update the existing traffic signal controller to provide three (3) phases, a protected/permissive eastbound/westbound left turn phase, a permissive eastbound/westbound phase, and a permissive northbound/southbound phase.

Option 2: Two-Lane Roundabout

- Includes a two (2) lane roundabout, with an inscribed circle diameter of 150 feet, with a 38-foot circulatory roadway width, providing two (2) travel lanes and a truck apron.
- The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive through and a shared through/right turn lane.
- Northbound Kingwood Pike approach provides one (1) lane, a shared left turn/through/right turn lane.
- Southbound Dorsey Avenue approach provides one (1) lane, a shared left turn/through/right turn lane.

Option 3: Left Turn Lanes on All Approaches

- Includes installation of a four (4) phased traffic signal, with a protected eastbound/westbound left turn phase, a permissive eastbound/westbound phase, a protected northbound/southbound left turn lane, and a permissive northbound/southbound phase.
- The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.
- The northbound Kingwood Pike approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.
- The southbound Dorsey Avenue approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.

7.3 Greenbag Road (CR 857) and Luckey Lane

Option 1: Twelve (12) Foot Travel Lanes on Greenbag Road

- Widen Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders on Greenbag Road.
- The eastbound Greenbag Road approach provide one (1) 12-foot travel lane for the shared left turn/through movement.
- The westbound Greenbag Road approach provides one (1) 12-foot travel lane for the shared through/right turn movement.
- The Luckey Lane approach and intersection operation will remain the same as existing conditions.

7.4 Greenbag Road (CR 857) and Richard Avenue

Option 1: Twelve (12) Foot Travel Lanes on Greenbag Road

- Widen Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders on Greenbag Road.
- The eastbound Greenbag Road approach provide one (1) 12-foot travel lane for the shared left turn/through movement.
- The westbound Greenbag Road approach provides one (1) 12-foot travel lane for the shared through/right turn movement.
- The Richard Avenue approach and intersection operation will remain the same as existing conditions.

Option 2: Luckey Lane Termination at Greenbag Road

- The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and an exclusive through lane.
- The westbound Greenbag Road approach provides two (2) lanes, an exclusive through lane and an exclusive right turn lane.
- The Richard Avenue approach and intersection operation will remain the same as existing conditions.

7.5 Greenbag Road (CR 857) and Lower Aarons Creek Road

Option 1: South-westbound Left Turn Lanes on Greenbag Road

- Includes installation of an exclusive south-westbound left turn lane on Greenbag Road. The south-westbound approach would provide an exclusive left turn lane and an exclusive through lane.
- Eastbound Greenbag Road approach to remain the same as existing conditions, a shared through/right turn lane.
- Northbound Lowers Creek Road approach and intersection operation to remain the same as existing conditions.

Option 2: Twelve (12) Foot Travel Lanes on Greenbag Road

- Widen Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders on Greenbag Road.
- The eastbound Greenbag Road approach provide one (1) 12-foot travel lane for the shared through/right turn movement.
- The south-westbound Greenbag Road approach provides one (1) 12-foot travel lane for the shared left turn/ through movement.
- The northbound Lower Aarons Creek Road approach and intersection operation will remain the same as existing conditions.

Option 3: Defined Commercial Driveway

- Construct a defined commercial driveway for the existing development located on the northwest quadrant of the intersection. The new southbound commercial driveway approach would provide one (1) lane for all movements, shared left turn/through/right turn movements.
- The south-westbound Greenbag Road approach will provide two (2) lanes, an exclusive left turn lane and a shared through/right lane.
- The eastbound Greenbag Road approach will provide one (1) lane, a shared left turn/through/right turn lane.
- The northbound Lower Aarons Creek Road approach will provide one (1) lane, as shared left turn/through/right turn lane.
- Stop signs will be installed on the side street approaches, on northbound Lower Aarons Creek Road approach and southbound commercial driveway approach.

7.6 Greenbag Road (CR 857) and Diamond Avenue

Option 1: Twelve (12) Foot Travel Lanes on Greenbag Road

- Widen Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders on Greenbag Road.
- The northbound Greenbag Road approach provide one (1) 12-foot travel lane for the shared through/right turn movement.
- The southbound Greenbag Road approach provides one (1) 12-foot travel lane for the shared left turn/ through movement.
- The westbound Diamond Avenue approach and intersection operation will remain the same as existing conditions.

Option 2: Warranted Turn Lanes on Greenbag Road

- Includes installation of an exclusive northbound right turn lane on Greenbag Road. The northbound approach would provide an exclusive through lane and an exclusive right turn lane.
- Southbound Greenbag Road approach to remain the same as existing conditions, a shared left turn/through lane.
- Westbound Diamond Avenue approach and intersection operation to remain the same as existing conditions.

Option 3: Traffic Signal

- Includes installation of a two (2) phased traffic signal, with a permissive northbound/southbound phase and a protected westbound phase.
- The northbound Greenbag Road approach provides one (1) lane, a shared through/right turn lane.
- The southbound Greenbag Road approach provides one (1) lane, a shared left turn/through lane.
- The westbound Diamond Avenue approach provides one (1) lane, a shared left turn/right turn lane.

8. 2048 Design Year Conditions Intersection Analyses With Improvement Options

Capacity and queue analyses were performed for the study intersections with the proposed improvement options, as detailed in Section 7, the Roadway and Intersection Improvement Options, of this report, for the Weekday AM, Weekday PM, and Saturday peak hour traffic volumes. Synchro software-based methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board (HCM 2010) was utilized for the 2048 design year with improvement options capacity and queue analyses for signalized and unsignalized intersections. SIDRA INTERSECTION 8.0, SIDRA Standard Delay Model was utilized for the 2048 design year with improvement options capacity and queue analyses for roundabouts.

8.1 Greenbag Road (CR 857) and Mississippi Avenue

At the intersection of Greenbag Road and Mississippi Avenue, five (5) alternative options were analyzed for the future Weekday AM, Weekday PM, and Saturday peak hours. The options included:

- Option 1: Eastbound Left Turn Lane on Greenbag Road
- Option 1A: Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach
- Option 2: Single-Lane Roundabout
- Option 3: Traffic Signal and Roadway Improvements
- Option 3A: Continuous Green T-Intersection Traffic Signal and Roadway Improvements

Details of these alternatives are provided in Section 7.1, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Mississippi Avenue are summarized in Table 5 and Table 6, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 5 for the Greenbag Road and Mississippi Avenue intersection.

Option 1 **Eastbound Left Turn Lane on Greenbag Road** **Greenbag Road and Mississippi Avenue – Capacity Analysis**
Option 1, Eastbound Left Turn Lane on Greenbag Road, capacity analysis indicates that the Mississippi Avenue approach will continue to operate at a LOS F during the Weekday AM and Weekday PM peak hours; however, the approach delay is anticipated to improve when compared to the 2048 design year conditions without improvements. In addition, the overall intersection level of service for the Weekday AM and Weekday PM peak hours are anticipated to improve when compared to the 2048 design year conditions without improvements. With the proposed improvement options, the overall intersection delay decreases, from LOS F (154.5 seconds of delay) to LOS F (54.2 seconds of delay) during the Weekday AM peak hour and from LOS D (30.0 seconds of delay) to LOS C (16.1 seconds of delay) during the Weekday PM peak hour, when comparing without improvements to with improvements from Option 1.

Option 1A

Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach
Greenbag Road and Mississippi Avenue – Capacity Analysis

Option 1A, Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach, capacity analysis indicates that the Mississippi Avenue approach will continue to operate at a LOS F during the Weekday AM and Weekday PM peak hours; however, the approach delay is anticipated to improve when compared to the 2048 design year conditions without improvements.

In addition, the overall intersection level of service for the Weekday AM and Weekday PM peak hours are anticipated to improve when compared to the 2048 design year conditions without improvements. With the proposed improvement Option 1A, the overall intersection level of service increases/decreases delay, from LOS F (154.5 seconds of delay) to LOS C (16.0 seconds of delay) during the Weekday AM peak hour and from LOS D (30.0 seconds of delay) to LOS A (8.1 seconds of delay) during the Weekday PM peak hour, when comparing without improvements to with improvements from Option 1A.

Option 2

Single-Lane Roundabout
Greenbag Road and Mississippi Avenue – Capacity Analysis

Option 2, Single-Lane Roundabout, is forecasted to operate at LOS B or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 3

Traffic Signal and Roadway Improvements
Greenbag Road and Mississippi Avenue – Capacity Analysis

Option 3, Traffic Signal and Roadway Improvements is forecasted to operate at LOS C or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 3A

Continuous Green T-Intersection Traffic Signal and Roadway Improvements
Greenbag Road and Mississippi Avenue – Capacity Analysis

Option 3A, Continuous Green T-Intersection Traffic Signal and Roadway Improvements, is forecasted to operate at LOS C or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Queue Analysis

The results of the queue analyses for the intersection improvement options at the Greenbag Road/Mississippi Avenue intersection are summarized in Table 6. As shown Table 6, Synchro HCM 2010 and SIDRA Roundabout 95th percentile queue lengths are not forecasted to obstruct adjacent intersections with the proposed improvement options. The following summarizes the required turn lane lengths per improvement option based on the queue analysis results.

Option 1

Eastbound Left Turn Lane on Greenbag Road
Greenbag Road and Mississippi Avenue – Queue Analysis

Option 1, Eastbound Left Turn Lane on Greenbag Road, based on the results of the queue analysis, the proposed eastbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

Option 1A

Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach
Greenbag Road and Mississippi Avenue – Queue Analysis

Option 1A, Eastbound Left Turn Lane on Greenbag Road and Two-Lane Mississippi Avenue Approach, based on the results of the queue analysis, the proposed eastbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

The proposed southbound Mississippi Avenue approach, an exclusive left turn lane and an exclusive right turn lane, experiences the longest queues during the Weekday AM peak hour, with a southbound left turn queue of 208 feet and a southbound right turn queue of 55 feet. Therefore, in order to accommodate the left turn queue, an approximately 225 foot turn lane, either left turn lane or right turn lane, would need to be provided, exclusive of taper length.

Option 2

Single-Lane Roundabout
Greenbag Road and Mississippi Avenue – Queue Analysis

Option 2, Single-Lane Roundabout, based on the results of the queue analysis, the proposed westbound channelized right turn by-pass lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

Option 3

Traffic Signal and Roadway Improvements
Greenbag Road and Mississippi Avenue – Queue Analysis

Option 3, Traffic Signal and Roadway Improvements, based on the results of the queue analysis, the proposed eastbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length, to accommodate the forecasted queue length. However, if it is desired to provide a turn lane length that would allow left turns to enter the turn lane prior to the back of queue of the eastbound through movement, then the eastbound left turn lane would need to provide approximately 225 feet of vehicle storage, exclusive of taper length.

The proposed westbound right turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of trapper length, to accommodate the forecasted queue length. However, if it is desired to provide a turn lane length that would allow right turns to enter the turn lane prior to the back of queue of the westbound through movement, then the westbound right turn lane would need to provide approximately 350 feet of vehicle storage, exclusive of taper length.

The proposed southbound Mississippi Avenue approach, an exclusive left turn lane and an exclusive right turn lane, experiences the longest queues during the Weekday AM peak hour, with a southbound left turn queue of 200 feet and a southbound right turn queue of 38 feet. Therefore, in order to accommodate the left turn queue, an approximately 225 foot turn lane, either left turn lane or right turn lane, would need to be provided, exclusive of taper length.

Option 3A **Continuous Green T- Intersection Traffic Signal and Roadway Improvements** **Greenbag Road and Mississippi Avenue – Queue Analysis**
Option 3A, Continuous Green T-Intersection Traffic Signal and Roadway Improvements, based on the results of the queue analysis, the proposed eastbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length, to accommodate the forecasted queue length. The proposed westbound right turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of trapper length, to accommodate the forecasted queue length. However, if it is desired to provide a turn lane length that would allow right turns to enter the turn lane prior to the back of queue of the westbound through movement, then the westbound right turn lane would need to provide approximately 400 feet of vehicle storage, exclusive of taper length. The proposed southbound Mississippi Avenue approach, an exclusive left turn lane and an exclusive right turn lane, experiences the longest queues during the Weekday AM peak hour, with a southbound left turn queue of 146 feet and a southbound right turn queue of 35 feet. Therefore, in order to accommodate the left turn queue, an approximately 150 foot turn lane, either left turn lane or right turn lane, would need to be provided, exclusive of taper length.

Synchro and SIDRA capacity and queue analysis printouts for intersection of Greenbag Road and Mississippi Avenue 2048 design year with improvement conditions are included in Appendix H to this report.

8.2 Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)

At the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike, three (3) alternative options for two (2) potential scenarios, with Luckey Lane connection to Greenbag Road to remain and with Luckey Lane connection to Greenbag Road terminated, were analyzed for the future Weekday AM, Weekday PM, and Saturday peak hour. The options included:

- Option 1: Left Turn Lanes on Greenbag Road
- Option 2: Two-Lane Roundabout
- Option 3: Left Turn Lanes on All Approaches

Details of these alternatives are provided in Section 7.2, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike are summarized in Table 7 and Table 8, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 7 for the Greenbag Road and Dorsey Avenue/Kingwood Pike intersection.

Option 1

Eastbound and Westbound Left Turn Lane on Greenbag Road
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection to Remain

Option 1, Left Turn Lanes on Greenbag Road, results of the capacity analyses indicate that with exclusive turn lanes on the eastbound and westbound Greenbag Road approaches and a protected/permissive advance left turn phase, the following approaches are forecasted to decrease level of service/increase delay when compared to the 2048 design year conditions without improvements:

- During the Weekday AM peak hour, the westbound Greenbag Road approach is forecasted to decrease level of service/increase delay from LOS C (21.2 seconds of delay) to LOS E (58.2 seconds of delay). This results in a delay increase of 37 seconds.

However, the following approaches or overall intersection levels of service are forecasted to increase, decrease delay, when compared to the 2048 design year conditions without improvements:

- During the Weekday PM peak hour, the eastbound Greenbag Road approach is forecasted to decrease in delay from LOS F (246.9 seconds of delay) to LOS F (91.6 seconds of delay). This results in a delay reduction of 155.3 seconds.
- During the Weekday PM peak hour, the westbound Greenbag Road approach is forecasted to decrease in delay from LOS E (72.9 seconds of delay) to LOS C (27.5 seconds of delay). This results in a delay reduction of 45.4 seconds.
- During the Weekday PM peak hour, the overall intersection is forecasted to increase level of service/decrease in delay from LOS F (129.1 seconds of delay) to LOS E (58.0 seconds of delay). This results in an overall intersection delay reduction of 71.1 seconds.

With Luckey Lane Connection Terminated

Option 1, Left Turn Lanes on Greenbag Road, results of the capacity analyses indicate that with exclusive turn lanes on the eastbound and westbound Greenbag Road approaches and a protected/permissive advance left turn phase, the following approaches or overall intersection level of service are forecasted to decrease, increase delay, when compared to the 2048 design year conditions without improvements:

- During the Weekday AM peak hour, the westbound Greenbag Road approach is forecasted to decrease level of service/increase delay from LOS C (21.2 seconds of delay) to LOS E (77.5 seconds of delay). This results in a delay increase of 56.3 seconds.
- During the Weekday PM peak hour, the westbound Greenbag Road approach is forecasted to decrease level of service/increase delay from LOS E (72.9 seconds of delay) to LOS F (85.3 seconds of delay). This results in a delay increase of 12.4 seconds.
- During the Weekday AM peak hour, the northbound Kingwood Pike approach is forecasted to decrease level of service/increase delay from LOS C (21.0 seconds of delay) to LOS E (74.4 seconds of delay). This results in a delay increase of 53.4 seconds.
- During the Weekday PM peak hour, the southbound Dorsey Avenue approach is forecasted to decrease level of service/increase delay from LOS D (44.3 seconds of delay) to LOS F (92.9 seconds of delay). This results in a delay increase of 48.6 seconds.
- During the Weekday AM peak hour, the overall intersection is forecasted to decrease level of service/increase delay form LOS D (40.7 seconds of delay) to LOS E (57.1 seconds of delay). This results in an overall intersection delay increase of 16.4 seconds.

Option 1 (Cont'd)

Eastbound and Westbound Left Turn Lane on Greenbag Road
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection Terminated (Cont'd)

However, the following approaches or overall intersection levels of service are forecasted to increase, decrease delay, when compared to the 2048 design year conditions without improvements:

- During the Weekday PM peak hour, the eastbound Greenbag Road approach is forecasted to increase lev of service/decrease delay from LOS F (246.9 seconds of delay) to LOS F (109.0 seconds of delay) during th Weekday PM peak hour. This results in a delay reduction of 137.9 seconds.
- During the Weekday PM peak hour, the overall intersection is forecasted to increase level service/decrease in delay from LOS F (129.1 seconds of delay) to LOS F (89.5 seconds of delay). This resul in an overall intersection delay reduction of 39.6 seconds.

Option 2

Two-Lane Roundabout
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection to Remain

Option 2, Roundabout, is forecasted to operate at LOS C or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

With Luckey Lane Connection Terminated

Option 2, Roundabout, is forecasted to operate at LOS D or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 3

Left Turn Lanes on All Approaches
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection to Remain

Option 3, Left Turn Lanes on All Approaches, results of the capacity analyses indicate that with exclusive turn lanes on all approaches and protected/permissive advance left turn phases on each approach, the following approaches are forecasted to decrease level of service/increase delay when compared to the 2048 design year conditions without improvements:

- During the Weekday AM peak hour, the westbound Greenbag Road approach is forecasted to decrease level of service/increase delay from LOS C (21.2 seconds of delay) to LOS D (41.4 seconds of delay). This results in a delay increase of 20.3 seconds.
- During the Weekday AM peak hour, the northbound Kingwood Pike approach is forecasted to decrease level of service/increase delay from LOS C (21.0 seconds of delay) to LOS D (42.2 seconds of delay). This results in a delay increase of 21.2 seconds.
- During the Weekday PM peak hour, the northbound Kingwood Pike approach is forecasted to decrease level of service/increase delay from LOS C (24.4 seconds of delay) to LOS D (39.7 seconds of delay). This results in a delay increase of 15.3 seconds.

Option 3 (Cont'd)

Left Turn Lanes on All Approaches
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection to Remain (Cont'd)

- During the Weekday PM peak hour, the southbound Dorsey Avenue approach is forecasted to decrease level of service/increase delay from LOS D (44.3 seconds of delay) to LOS E (62.7 seconds of delay). This results in a delay increase of 18.4 seconds.

However, the following approaches or overall intersection levels of service are forecasted to increase, decrease delay, when compared to the 2048 design year conditions without improvements:

- During the Weekday PM peak hour, the eastbound Greenbag Road approach is forecasted to decrease in delay from LOS F (246.9 seconds of delay) to LOS D (48.4 seconds of delay). This results in a delay reduction of 198.5 seconds.
- During the Weekday PM peak hour, the westbound Greenbag Road approach is forecasted to decrease in delay from LOS E (72.9 seconds of delay) to LOS C (29.7 seconds of delay). This results in a delay reduction of 43.2 seconds.
- During the Weekday PM peak hour, the overall intersection is forecasted to increase level of service/decrease in delay from LOS F (129.1 seconds of delay) to LOS D (45.8 seconds of delay). This results in an overall intersection delay reduction of 83.3 seconds.

With Luckey Lane Connection Terminated

Option 3, Left Turn Lanes on All Approaches, results of the capacity analyses indicate that with exclusive turn lanes on all approaches and protected/permissive advance left turn phases on each approach, the following approaches/overall intersection are forecasted to decrease level of service/increase delay when compared to the 2048 design year conditions without improvements:

- During the Weekday AM peak hour, the westbound Greenbag Road approach is forecasted to decrease level of service/increase delay from LOS C (21.2 seconds of delay) to LOS D (47.0 seconds of delay). This results in a delay increase of 25.8 seconds.
- During the Weekday AM peak hour, the northbound Kingwood Pike approach is forecasted to decrease level of service/increase delay from LOS C (21.0 seconds of delay) to LOS E (61.5 seconds of delay). This results in a delay increase of 40.5 seconds.
- During the Weekday PM peak hour, the northbound Kingwood Pike approach is forecasted to decrease level of service/increase delay form LOS C (24.4 seconds of delay) to LOS D (44.4 seconds of delay). This results in a delay increase of 20.0 seconds.
- During the Weekday AM peak hour, the southbound Dorsey Avenue approach is forecasted to decrease level of service/increase delay from LOS C (28.1 seconds of delay) to LOS D (42.9 seconds of delay). This results in a delay increase of 14.8 seconds.
- During the Weekday PM peak hour, the southbound Dorsey Avenue approach is forecasted to decrease level of service/increase delay from LOS D (44.3 seconds of delay) to LOS E (63.5 seconds of delay). This results in a delay increase of 19.2 seconds.

Option 3 (Cont'd)

Left Turn Lanes on All Approaches
Greenbag Road and Dorsey Avenue/Kingwood Pike – Capacity Analysis

With Luckey Lane Connection Terminated (Cont'd)

However, the following approaches or overall intersection levels of service are forecasted to increase, decrease delay, when compared to the 2048 design year conditions without improvements:

- During the Weekday PM peak hour, the eastbound Greenbag Road approach is forecasted to increase level of service/decrease delay from LOS F (246.9 seconds of delay) to LOS D (49.3 seconds of delay). This results in a delay reduction of 197.6 seconds.
- During the Weekday PM peal hour, the westbound Greenbag Road approach is forecasted to increase level of service/decrease delay from LOS E (72.9 seconds of delay) to LOS D (39.7 seconds of delay). This results in a delay reduction of 33.2 seconds.
- During the Weekday PM peak hour, the overall intersection is forecasted to increase level of service/decrease in delay from LOS F (129.1 seconds of delay) to LOS D (49.2 seconds of delay). This results in an overall intersection delay reduction of 79.9 seconds.

Queue Analysis

The results of the queue analyses for the intersection improvement options at the Greenbag Road/Dorsey Avenue/Kingwood Pike intersection are summarized in Table 8. The following summarizes the queue analysis results per improvement option at the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike.

Option 1

Eastbound and Westbound Left Turn Lane on Greenbag Road
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection to Remain

Option 1, Left Turn Lanes on Greenbag Road, based on the results of the queue analysis, summarized in Table 8, the following movements are forecasted to obstruct adjacent intersections or driveways:

- Eastbound Greenbag Road shared through/right turn movement is forecasted to extend back through the intersection of Bluegrass Village Driveway during the Weekday PM peak hour.
- Southbound Dorsey Avenue approach queue is forecasted to extend back through the intersection of Luckey Lane during the Weekday PM peak hour.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 399 feet during the Weekday AM peak hour, 732 feet during the Weekday PM peak hour, and 234 feet during the Saturday peak hour.

The proposed westbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 543 feet during the Weekday AM peak hour, 378 feet during the Weekday PM peak hour, and 160 feet during the Saturday peak hour.

Option 1 (Cont'd)

Eastbound and Westbound Left Turn Lane on Greenbag Road
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection Terminated

Option 1, Left Turn Lanes on Greenbag Road, based on the results of the queue analysis, summarized in Table 8, the following movements are forecasted to obstruct adjacent intersections or driveways:

- Eastbound Greenbag Road shared through/right turn movement is forecasted to extend back through the intersection of Bluegrass Village Driveway during the Weekday PM peak hour.
- Southbound Dorsey Avenue approach queue is forecasted to extend back through the intersection of Luckey Lane during the Weekday PM peak hour.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 331 feet during the Weekday AM peak hour, 756 feet during the Weekday PM peak hour, and 267 feet during the Saturday peak hour.

The proposed westbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 656 feet during the Weekday AM peak hour, 655 feet during the Weekday PM peak hour, and 217 feet during the Saturday peak hour.

Option 2

Two-Lane Roundabout
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection to Remain

Option 2, Roundabout, based on the results of the queue analysis, summarized in Table 8, no queues are forecasted obstruct adjacent intersections.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 517 feet during the Weekday PM peak hour.

The proposed westbound left turn lane on Greenbag Road would need provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 211 feet during the Weekday AM peak hour.

Option 2 (Cont'd)

Two-Lane Roundabout
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection Terminated

Option 2, Roundabout, based on the results of the queue analysis, summarized in Table 8, no queues are forecasted obstruct adjacent intersections.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 765 feet during the Weekday PM peak hour. The eastbound through/right turn movement is anticipated to queue back through the intersection of Bluegrass Village Driveway.

The proposed westbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 394 feet during the Weekday AM peak hour and 765 feet during the Weekday PM peak hour.

Option 3

Left Turn Lanes on All Approaches
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection to Remain

Option 3, Left Turn Lanes on All Approaches, based on the results of the queue analysis, summarized in Table 8, the following movements are forecasted to obstruct adjacent intersections or driveways:

- Eastbound Greenbag Road shared through/right turn movement is forecasted to extend back through the intersection of Bluegrass Village Driveway during the Weekday PM peak hour.
- Southbound Dorsey Avenue approach queue is forecasted to extend back through the intersection of Luckey Lane during the Weekday PM peak hour.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound through lane, since the through movement is forecasted to queue approximately 387 feet during the Weekday AM peak hour, 811 feet during the Weekday PM peak hour, and 282 feet during the Saturday peak hour.

The proposed westbound left turn lane on Greenbag Road would need to provide approximately 150 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound shared through/right turn lane, since the shared through/right turn movement is forecasted to queue approximately 531 feet during the Weekday AM peak hour, 438 feet during the Weekday PM peak hour, and 190 feet during the Saturday peak hour.

The proposed northbound left turn lane on Kingwood Pike would need to provide approximately 150 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the northbound through lane, since the through movement is forecasted to queue approximately 408 feet during the Weekday AM peak hour and 151 feet during the Weekday PM peak hour.

Option 3 (Cont'd)

Left Turn Lanes on All Approaches
Greenbag Road and Dorsey Avenue/Kingwood Pike – Queue Analysis

With Luckey Lane Connection to Remain (Cont'd)

The proposed southbound left turn lane on Dorsey Avenue would need to provide approximately 150 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the southbound through lane, since the through movement is forecasted to queue approximately 479 feet during the Weekday PM peak hour.

With Luckey Lane Connection Terminated

Option 3, Left Turn Lanes on All Approaches, based on the results of the queue analysis, summarized in Table 8, the following movements are forecasted to obstruct adjacent intersections or driveways:

- Eastbound Greenbag Road shared through/right turn movement is forecasted to extend back through the intersection of Bluegrass Village Driveway during the Weekday PM peak hour.
- Southbound Dorsey Avenue approach queue is forecasted to extend back through the intersection of Luckey Lane during the Weekday PM peak hour.

Based on the results of the queue analysis, the proposed eastbound left turn lane on Greenbag Road would need to provide approximately 150 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the eastbound through lane, since the through movement is forecasted to queue approximately 335 feet during the Weekday AM peak hour, 811 feet during the Weekday PM peak hour, and 282feet during the Saturday peak hour.

The proposed westbound left turn lane on Greenbag Road would need to provide approximately 150 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the westbound through lane, since the through movement is forecasted to queue approximately 637 feet during the Weekday AM peak hour, 676 feet during the Weekday PM peak hour, and 229 feet during the Saturday peak hour.

The proposed northbound left turn lane on Kingwood Pike would need to provide approximately 175 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the northbound through lane, since the through movement is forecasted to queue approximately 436 feet during the Weekday AM peak hour.

The proposed southbound left turn lane on Dorsey Avenue would need to provide approximately 225 feet of vehicular storage, exclusive of taper length. This storage length will not allow left turns to enter the turn lane prior to the back of queue from the southbound through lane, since the through movement is forecasted to queue approximately 490 feet during the Weekday PM peak hour.

Synchro and SIDRA capacity and queue analysis printouts for the Greenbag Road and Dorsey Avenue/Kingwood Pike 2048 design year with improvement options conditions are included in Appendix H to this report.

8.3 Greenbag Road (CR 857) and Luckey Lane

At the intersection of Greenbag Road and Luckey Lane, one (1) alternative option was analyzed for the future Weekday AM, Weekday PM, and Saturday peak hours. This option included widening Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders. Details of this alternative is provided in Section 7, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Luckey Lane are summarized in Table 9 and Table 10, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 9 for the Greenbag Road and Luckey Lane intersection.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Luckey Lane – Capacity Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, indicate that the Luckey Lane approach will continue to operate at a LOS F during the Weekday AM and LOS E during the Weekday PM peak hours; however, the overall intersection level of service is forecasted to operate at LOS A for the Weekday AM, Weekday PM, and Saturday peak hours.

Queue Analysis

The results of the queue analyses for the intersection improvement option at the Greenbag Road/Luckey Lane intersection is summarized in Table 10.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Luckey Lane – Queue Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, based on the results of the queue analysis, queue lengths are not forecasted to obstruct adjacent intersections or driveways. Queue lengths on Luckey Lane are forecasted to extend 58 feet during the Weekday AM peak hour, 55 feet during the Weekday PM peak hour, and 20 feet during the Saturday peak hour.

Synchro capacity and queue analysis printouts for the Greenbag Road and Luckey Lane 2048 design year with improvement options conditions are included in Appendix H to this report.

8.4 Greenbag Road (CR 857) and Richard Avenue

At the intersection of Greenbag Road and Richard Avenue, two (2) alternative options were analyzed for the future Weekday AM, Weekday PM, and Saturday peak hours. The options included widening Greenbag Road to provide twelve (12) foot travel lanes with four (4) foot shoulders and improvements needed with Luckey Lane termination at Greenbag Road. Details of these alternatives are provided Section 7, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Richard Avenue are summarized in Table 11 and Table 12, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 11 for the Greenbag Road and Richard Avenue intersection.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Richard Avenue – Capacity Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, indicate that the Richard Avenue approach will continue to operate at a LOS E during the Weekday AM peak hour; however, the overall intersection level of service is forecasted to operate at LOS A for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 2 **Luckey Lane Termination at Greenbag Road** **Greenbag Road and Richard Avenue – Capacity Analysis**
Option 2, Twelve (12) Foot Travel Lanes on Greenbag Road, incorporates an eastbound left turn lane on Greenbag Road and a westbound right turn lane on Greenbag Road, based on turn lane warrants. The capacity analyses indicate that with rerouted Luckey Lane traffic and installation of an exclusive eastbound left turn lane and an exclusive westbound right turn lane, the Richard Avenue approach will continue to operate at a LOS E during the Weekday AM peak hour; however, the overall intersection level of service is forecasted to operate at LOS A for the Weekday AM, Weekday PM, and Saturday peak hours.

Queue Analysis

The results of the queue analyses for the intersection improvement options at the Greenbag Road/Richard Avenue intersection are summarized in Table 12. As shown in Table 12, Synchro HCM 2010 95th percentile queue lengths are not forecasted to obstruct adjacent intersections or driveways with any proposed improvement option. The following summarizes the results of the queue analyses and any required turn lane lengths per improvement option based on the queue analyses results.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Richard Avenue – Queue Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, based on the results of the queue analysis, queue lengths are not forecasted to obstruct adjacent intersections or driveways. Queue lengths on Richard Avenue are forecasted to extend 93 feet during the Weekday AM peak hour, 20 feet during the Weekday PM peak hour, and 3 feet during the Saturday peak hour.

Option 2 **Luckey Lane Termination at Greenbag Road** **Greenbag Road and Richard Avenue – Queue Analysis**
Option 2, Luckey Lane Termination at Greenbag Road, based on the results of the queue analysis, the proposed eastbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. In addition, the proposed westbound right turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

Synchro capacity and queue analysis printouts for the Greenbag Road and Richard Avenue 2048 design year with improvement options conditions are included in Appendix H to this report.

8.5 Greenbag Road (CR 857) and Lower Aarons Creek Road

At the intersection of Greenbag Road and Lower Aarons Creek Road, three (3) alternative options were analyzed for the future Weekday AM, Weekday PM, and Saturday peak hours. The options included warranted turn lanes on Greenbag Road, twelve (12) foot travel lanes on Greenbag Road, and a defined commercial driveway. Details of these alternatives are provided in Section 7, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Lower Aarons Creek Road are summarized in Table 13 and Table 14, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 13 for the Greenbag Road and Lower Aarons Creek Road intersection.

Option 1 **Warranted Turn Lanes on Greenbag Road** **Greenbag Road and Lower Aarons Creek Road – Capacity Analysis**
Option 1, Warranted Turn Lanes on Greenbag Road (south-westbound left turn lane on Greenbag Road), is forecasted to operate at a LOS C or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 2 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Lower Aarons Creek Road – Capacity Analysis**
Option 2, Twelve (12) Foot Travel Lanes on Greenbag Road, is forecasted to operate at LOS C or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 3 **Defined Commercial Driveway** **Greenbag Road and Lower Aarons Creek Road – Capacity Analysis**
Option 3, Defined Commercial Driveway, is forecasted to operate at LOS D or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Queue Analysis

The results of the queue analyses for the intersection improvement options at the Greenbag Road/Lower Aarons Creek Road Avenue intersection are summarized in Table 14. As shown in Table 14, Synchro HCM 2010 95th percentile queue lengths are not forecasted to obstruct adjacent intersections or driveways with any proposed improvement option. The

following summarizes the results of the queue analyses and any required turn lane lengths per improvement option based on the queue analyses results.

Option 1 **Warranted Turn Lanes on Greenbag Road** **Greenbag Road and Lower Aarons Creek Road – Queue Analysis**
Option 1, Warranted Turn Lanes on Greenbag Road (south-westbound left turn lane on Greenbag Road), based on the results of the queue analysis, the proposed south-westbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

Option 2 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Lower Aarons Creek Road – Queue Analysis**
Option 2, Twelve Foot Travel Lanes on Greenbag Road, based on the results of the queue analysis, no queues are forecasted to obstruct adjacent intersections or driveways.

Option 3 **Defined Commercial Driveway** **Greenbag Road and Lower Aarons Creek Road – Capacity Analysis**
Option 3, Defined Commercial Driveway Traffic Signal, based on the results of the queue analysis, the proposed south-westbound left turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length. No queues are forecasted to obstruct adjacent intersections or driveways.

Synchro capacity and queue analysis printouts for the Greenbag Road and Lower Aarons Creek Road 2048 design year with improvement options conditions are included in Appendix H to this report.

8.6 Greenbag Road (CR 857) and Diamond Avenue

At the intersection of Greenbag Road and Diamond Avenue, three (3) alternative options were analyzed for the future Weekday AM, Weekday PM, and Saturday peak hours. The options included twelve (12) foot travel lanes on Greenbag Road, Warranted Turn Lanes on Greenbag Road, and installation of a traffic signal. Details of these alternatives are provided in Section 7, Roadway and Intersection Improvements Options, of this report.

The results of the capacity and queue analyses performed for the 2048 design year traffic volumes at the intersection of Greenbag Road and Diamond Avenue are summarized in Table 15 and Table 16, respectively, for the Weekday AM, Weekday PM, and Saturday peak hours.

Capacity Analysis

The following summarizes the results of the capacity analyses, as summarized in Table 15 for the Greenbag Road and Diamond Avenue intersection.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Diamond Avenue – Capacity Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, is forecasted to operate at LOS B or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 2 **Warranted Turn Lanes on Greenbag Road** **Greenbag Road and Diamond Avenue – Capacity Analysis**
Option 2, Warranted Turn Lanes on Greenbag Road (northbound right turn lane on Greenbag Road), is forecasted to operate at a LOS B or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Option 3 **Traffic Signal** **Greenbag Road and Diamond Avenue – Capacity Analysis**
Option 3, Traffic Signal, is forecasted to operate at LOS B or better for all movements, approaches, and overall intersection levels of service for the Weekday AM, Weekday PM, and Saturday peak hours.

Queue Analysis

The results of the queue analyses for the intersection improvement options at the Greenbag Road/Diamond Avenue intersection are summarized in Table 16. As shown in Table 16, Synchro HCM 2010 95th percentile queue lengths are not forecasted to obstruct adjacent intersections or driveways with any proposed improvement option. The following summarizes the results of the queue analyses and any required turn lane lengths per improvement option based on the queue analyses results.

Option 1 **Twelve-Foot Travel Lanes on Greenbag Road** **Greenbag Road and Diamond Avenue – Queue Analysis**
Option 1, Twelve (12) Foot Travel Lanes on Greenbag Road, based on the results of the queue analysis, no queues are forecasted to obstruct adjacent intersections or driveways.

Option 2 **Warranted Turn Lanes on Greenbag Road** **Greenbag Road and Diamond Avenue – Queue Analysis**
Option 2, Warranted Turn Lanes on Greenbag Road (south-westbound left turn lane on Greenbag Road), based on the results of the queue analysis, the proposed northbound right turn lane would need to provide approximately 125 feet of vehicular storage, exclusive of taper length.

Option 3 **Traffic Signal** **Greenbag Road and Diamond Avenue – Queue Analysis**
Option 3, Traffic Signal, based on the results of the queue analysis, no queues are forecasted to obstruct adjacent intersections or driveways.

Synchro capacity and queue analysis printouts for the Greenbag Road and Diamond Avenue 2048 design year with improvement options conditions are included in Appendix H to this report.

9. Turn Lane Warrant Evaluation

Guidelines for the provisions of left turn and right turn lanes along Greenbag Road, Dorsey Avenue, and Kingwood Pike were evaluated in accordance with the procedure in the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets* and in the National Cooperative Highway Report Program (NCHRP) Report 457. A detailed summary of warranted turn lanes at the study intersections are shown in Table 17 of this report.

A general summary of the turn lane warrants and required turn lane lengths, calculated per AAHSTO and based on the Synchro analysis (per improvement option), are summarized in the table below.

Turn Lane Warrant Summary

Intersection	Turn Lane (Travel Direction)	Turn Lane Warranted?	Turn Lane Length (Feet)			
			Per AASHTO	Per Synchro Analysis Results**		
				Option 1	Option 2	Option 3
Greenbag Road and Mississippi Avenue	Left Turn Lane (EB)	Yes	250'	125'	--	125'
	Right Turn Lane (WB)	Yes	325'	--	125'	125'
Greenbag Road and Dorsey Avenue/Kingwood Pike	Left Turn Lane (EB)	Yes	250'	125'/125'	125'/125'	125'/150'
	Right Turn Lane (EB)	Yes	250'	--/--	--/--	--/--
	Left Turn Lane (WB)	Yes	200'	125'/125'	125'/125'	150'/150'
	Right Turn Lane (WB)	Yes*	325'*	--/--	--/--	--/--
	Left Turn Lane (NB)	Yes	250'	--/--	--/--	150'/175'
	Right Turn Lane (NB)	Yes	250'	--/--	--/--	--/--
	Left Turn Lane (SB)	Yes	350'	--/--	--/--	150'/225'
	Right Turn Lane (SB)	Yes	275'	--/--	--/--	--/--
Greenbag Road and Luckey Lane	Left Turn Lane (EB)	No	--	--	N/A	N/A
	Right Turn Lane (WB)	Yes	225'	--	N/A	N/A
Greenbag Road and Richard Avenue	Left Turn Lane (EB)	Yes	150'	--	125'	N/A
	Right Turn Lane (WB)	Yes	125'	--	125'	N/A
Greenbag Road and Lower Aarons Creek Road	Left Turn Lane (SWB)	Yes	125'	125'	--	125'
	Right Turn Lane (NEB)	No	--	--	--	--
Greenbag Road and Diamond Avenue	Left Turn Lane (SB)	No	--	--	--	--
	Right Turn Lane (NB)	Yes	200'	--	125'	--

*Warranted only with termination of Luckey Lane at Greenbag Road.

** Turn Lane Lengths at the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike per the synchro analysis results reported as, Luckey Lane Connection Remains (feet) / Luckey Lane Terminated (feet)

N/A denotes improvement option not analyzed at the intersection.

At the intersection of Greenbag Road and Mississippi Avenue, turn lane warrants were evaluated for the eastbound left turn lane and westbound right turn lane on Greenbag Road for a twelve (12) hour period. The analysis indicated that an eastbound left turn lane is currently warranted for six (6) hours out of the twelve (12) hours analyzed (warranted at 7:00 AM and from 1:00 PM through 5:00 PM). Under forecasted 2048 Design Year conditions, the eastbound left turn lane is warranted for ten (10) hours out of the twelve (12) hours analyzed (warranted at 7:00 AM and from 10:00 AM

through 6:00 PM). The eastbound left turn lane should provide a minimum of 200 feet of vehicle storage, exclusive of bay taper, for 2048 Design Year conditions, per AASHTO.

Likewise, the analysis indicated that a westbound right turn lane is currently warranted for two (2) hours out of the twelve (12) hours analyzed (warranted at 7:00 AM and 8:00 AM). Under forecasted 2048 Design Year conditions, the westbound right turn lane is warranted for four (4) hours out of the twelve (12) hours analyzed (warranted at 7:00 AM, 8:00 AM, 2:00 PM, and 4:00 PM). The westbound right turn lane should provide a minimum of 325 feet of vehicle storage, exclusive of bay taper, for 2048 Design Year conditions, per AASHTO.

A detailed turn lane warrant summary for the intersection of Greenbag Road and Mississippi Avenue is presented on Table 18.

Printouts of all turn lane warrants are included in Appendix I to this report.

10. Signal Warrant Evaluation

The existing unsignalized study intersections were evaluated per signal warrant criteria in the Federal Highway Administration (FHWA) *Manual on Uniform Traffic Control Devices, 2009 Edition* (MUTCD). Warrant 2, Four-Hour Vehicular Volume, and Warrant 3, Peak Hour, were evaluated against available peak hour traffic volumes at each existing unsignalized study intersection. Right turn volumes for the minor street approaches have been reduced in accordance with Pagones Theorem where the percentage of right turns is known. A detailed summary of the signal warrant evaluation is provided in Table 19.

A general summary of the signal warrant evaluation is presented below.

Signal Warrant Summary

Intersection	Condition	Warrant Satisfied?		
		Warrant 1, Eight Hour	Warrant 2, Four Hour	Warrant 3, Peak Hour
Greenbag Road and Mississippi Avenue	2018 Existing	No	Yes	Yes
	2048 Design Year	Yes	Yes	Yes
Greenbag Road and Luckey Lane	2018 Existing	N/A	No	No
	2048 Design Year	N/A	Yes	Yes
Greenbag Road and Richard Avenue	2018 Existing	N/A	No	No
	2048 Design Year	N/A	No	Yes
Greenbag Road and Lower Aarons Creek Road	2018 Existing	N/A	No	No
	2048 Design Year	N/A	No	No
Greenbag Road and Diamond Avenue	2018 Existing	N/A	No	No
	2048 Design Year	N/A	Yes	Yes

In addition, Warrant 1, Eight Hour Warrant, was evaluated at the intersection of Greenbag Road and Mississippi Avenue utilizing the twelve (12) hour of turning movement count data, as detailed in Section 3.1. The Eight Hour Warrant evaluates if the following conditions:

- Condition A, The Minimum Vehicular Volume, is intended for application at locations where a large volume of intersection traffic is the principal reason to consider installing a traffic control signal.

- Condition B, The Interruption of Continuous Traffic, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

An Eight Hour Warrant is considered satisfied if Condition A is met, if Condition B is met, or if a combination of Condition A and Condition B is met. is not satisfied for 2019 existing traffic conditions.

Based on the results of the evaluation, an Eight Hour Warrant is not satisfied for either Condition A, Condition B, or a combination of Condition A and Condition B for 2018 existing traffic volume conditions. However, Condition B of the Eight Hour Warrant is satisfied for 2048 Design Year traffic conditions.

Copies of the signal warrant evaluation worksheets are included in the Appendix J to this report.

11. Summary

The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delay during the peak hours, and increased volume of truck traffic and development traffic within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility.

As detailed in this study, traffic analyses were completed for the Greenbag Road corridor to evaluate the existing operations of the study intersections and potential future intersection improvement alternatives. The traffic analyses completed details the findings from the intersection capacity analyses, intersection queue analyses, turn lane warrant evaluation, and signal warrant evaluation at each of the study intersection selected within the Greenbag Road corridor.

The traffic analyses completed and summarized in the study should be utilized as a tool for determining the best fit improvement project(s) for preliminary investigation and engineering for the selected study intersection within the Greenbag Road corridor.

The following provides an overall summary of the analyses completed per intersection. In addition, provided with this study are summary tables, figures, technical appendices, and a CD containing Synchro analysis files.

11.1 Greenbag Road (CR 857) and Mississippi Avenue Summary

Proposed Alternative Options

Option	Description
1	• Exclusive eastbound left turn lane on Greenbag Road • Maintaining existing unsignalized operation
1A	• Exclusive eastbound left turn lane on Greenbag Road • Exclusive southbound left turn lane and southbound right turn lane on Mississippi Avenue • Maintaining existing unsignalized operation
2	• Single Lane Roundabout • Exclusive westbound by-pass right turn lane on Greenbag Road
3	• Installation of a three-phase traffic signal • Exclusive eastbound left turn lane on Greenbag Road • Exclusive westbound right turn lane on Greenbag Road • Exclusive southbound left turn lane and southbound right turn lane on Mississippi Avenue
3A	• Installation of a three-phase traffic signal with a continue green for the eastbound through movement on Greenbag Road • Exclusive eastbound left turn lane on Greenbag Road • Exclusive westbound right turn lane on Greenbag Road • Exclusive southbound left turn lane and southbound right turn lane on Mississippi Avenue

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)					
	2048 Design Year Without Improvements	2048 Design Year With Improvements				
		Option 1	Option 1A	Option 2	Option 3	Option 3A
AM PEAK HOUR						
EB Greenbag Rd	A	A	A	A	A	C
WB Greenbag Rd	A	A	A	A	B	B
SB Mississippi Ave	F (826.4)	F (276.3)	F (80.3)	A	C	C
Overall Intersection	**F (154.5)**	**F (52.4)**	**C**	**A**	**B**	**B**
PM PEAK HOUR						
EB Greenbag Rd	A	A	A	A	A	C
WB Greenbag Rd	A	A	A	A	B	B
SB Mississippi Ave	F (330.1)	F (171.3)	F (79.0)	A	B	B
Overall Intersection	**D**	**C**	**A**	**A**	**A**	**B**
SATURDAY PEAK HOUR						
EB Greenbag Rd	A	A	A	A	A	C
WB Greenbag Rd	A	A	A	A	B	B
SB Mississippi Ave	F (826.4)	F (276.3)	F (80.3)	A	C	C
Overall Intersection	**F (154.5)**	**F (52.4)**	**C**	**A**	**B**	**B**

Turn Lane - Queue Summary

Approach (Turn Lane)	Turn Lane Length (Feet)					
	Per AASHTO	Per Synchro Analysis Results				
		Option 1	Option 1A	Option 2	Option 3	Option 3A
EB Greenbag Rd (Left)	250’	125’	125’	--	125’	125’
WB Greenbag Rd (Right)	325’	--	--	125’	125’-325’*	125‘-400’*
SB Greenbag (Left or Right)	225’	--	225’	--	225’	400’

* Indicates the “Required storage length for the turn lane per Synchro” – “Required storage length for a vehicle to enter the turn lane prior to the back of queue of the adjacent through movement per Synchro, if greater than turn lane queue”.

11.2 Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) Summary

Proposed Alternative Options

Option	Description
1	• Upgrading traffic signal control operation to three (3)-phases • Exclusive eastbound left turn lane on Greenbag Road • Exclusive westbound left turn lane on Greenbag Road
2	• Two (2) Lane Roundabout • Exclusive eastbound left turn lane on Greenbag Road • Exclusive westbound left turn lane on Greenbag Road • Single lane approaches on both Dorsey Avenue and Kingwood Pike
3	• Upgrading traffic signal control operation to four (4)-phases • Exclusive eastbound left turn lane on Greenbag Road • Exclusive westbound right turn lane on Greenbag Road • Exclusive southbound left turn lane on Dorsey Avenue • Exclusive northbound left turn lane on Kingwood Pike

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)						
	2048 Design Year Without Improvements	2048 Design Year With Improvements					
		Luckey Lane Connection Remains			Luckey Lane Connection Terminated		
		Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
AM PEAK HOUR							
EB Greenbag Rd	C	C	A	C	C	A	C
WB Greenbag Rd	C	E (58.2)	B	D	E (77.5)	B	D
NB Kingwood Pike	E (72.9)	D	C	D	E (74.4)	D	E (61.5)
SB Dorsey Ave	C	B	B	C	C	B	D
Overall Intersection	**D**	**D**	**B**	**D**	**E (57.1)**	**C**	**D**
PM PEAK HOUR							
EB Greenbag Rd	F (246.9)	F (96.1)	C	D	F (109.0)	D	D
WB Greenbag Rd	E (72.9)	C	C	C	F (85.3)	B	D
NB Kingwood Pike	C	C	B	D	C	B	D
SB Dorsey Ave	D	D	C	E (62.7)	F (92.9)	D	E (63.5)
Overall Intersection	**F (129.1)**	**E (58.0)**	**B**	**D**	**F (89.5)**	**C**	**D**
SATURDAY PEAK HOUR							
EB Greenbag Rd	C	B	A	B	B	A	B
WB Greenbag Rd	B	B	A	B	B	A	B
NB Kingwood Pike	C	B	A	C	B	A	C
SB Dorsey Ave	**C**	B	A	C	B	A	B
Overall Intersection	**B**	**B**	**A**	**B**	**B**	**A**	**B**

Turn Lane - Queue Summary

Approach (Turn Lane)	Turn Lane Length (Feet)						
	Per AASHTO	Per Synchro Analysis Results					
		Luckey Lane Connection Remains			Luckey Lane Connection Terminated		
		Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
EB Greenbag Road (Left)	250’	125’-750’*	125’-525’*	125’-825’*	125’-775’*	125’-775’*	125’-825’*
WB Greenbag Road (Left)	200’	125’-550’*	125’-225’*	125’-550’*	125’-675’*	125’-400’*	150‘-700’*
NB Kingwood Pike (Left)	250’	--	--	150’-425’*	--	--	175’-450’*
SB Dorsey Avenue (Left)	350’	--	--	125’-500’*	--		225’-500’*

* Indicates the “Required storage length for the turn lane per Synchro” – “Required storage length for a vehicle to enter the turn lane prior to the back of queue of the adjacent through movement per Synchro, if greater than turn lane queue”.

11.3 Greenbag Road (CR 857) and Luckey Lane Summary

Proposed Alternative Options

Option	Description
1	• Twelve (12) foot travel lanes on Greenbag Road • Maintaining existing unsignalized operation
2	• Termination of Luckey Lane at Greenbag Road, assuming an alternate connection to Luckey Lane via Richard Avenue.

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)	
	2048 Design Year Without Improvements	2048 Design Year With Improvements
		Option 1
AM PEAK HOUR		
EB Greenbag Rd	A	A
WB Greenbag Rd	A	A
SB Luckey Lane	F (52.3)	F (52.3)
Overall Intersection	**A**	**A**
PM PEAK HOUR		
EB Greenbag Rd	A	A
WB Greenbag Rd	A	A
SB Luckey Lane	E (43.5)	E (43.5)
Overall Intersection	**A**	**A**
SATURDAY PEAK HOUR		
EB Greenbag Rd	A	A
WB Greenbag Rd	A	A
SB Luckey Lane	**C**	**C**
Overall Intersection	**A**	**A**

Turn Lane - Queue Summary

Turn lanes are not proposed as potential improvement options at this intersection.

11.4 Greenbag Road (CR 857) and Richard Avenue Summary

Proposed Alternative Options

Option	Description
1	• Twelve (12) foot travel lanes on Greenbag Road • Maintaining existing unsignalized operation
2	• Termination of Luckey Lane at Greenbag Road, assuming an alternate connection to Luckey Lane via Richard Avenue.

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)		
	2048 Design Year Without Improvements	2048 Design Year With Improvements	
		Option 1	Option 2
AM PEAK HOUR			
EB Greenbag Rd	A	A	A
WB Greenbag Rd	A	A	A
SB Richard Ave	E (40.8)	E (40.3)	E (35.3)
Overall Intersection	**A**	**A**	**A**
PM PEAK HOUR			
EB Greenbag Rd	A	A	A
WB Greenbag Rd	A	A	A
SB Richard Ave	C	C	C
Overall Intersection	**A**	**A**	**A**
SATURDAY PEAK HOUR			
EB Greenbag Rd	A	A	A
WB Greenbag Rd	A	A	A
SB Richard Ave	B	B	B
Overall Intersection	**A**	**A**	**A**

Turn Lane - Queue Summary

Approach (Turn Lane)	Turn Lane Length (Feet)		
	Per AASHTO	Per Synchro Analysis Results	
		Option 1	Option 2
EB Greenbag Rd (Left)	150’	--	125’
WB Greenbag Rd (Right)	125’	--	125’

11.5 Greenbag Road (CR 857) and Lower Aarons Creek Road Summary

Proposed Alternative Options

Option	Description
1	• Exclusive south-westbound left turn lane on Greenbag Road • Maintaining existing unsignalized operation
2	• Twelve (12) foot travel lanes on Greenbag Road • Maintaining existing unsignalized operation
3	• Defined Commercial Driveway as fourth leg to the intersection on the northwest quadrant • Exclusive south-westbound left turn lane on Greenbag Road • Maintain unsignalized operation with stop sign control on the northbound Lower Aarons Creek Road approach and southbound commercial Driveway approach.

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)			
	2048 Design Year Without Improvements	2048 Design Year With Improvements		
		Option 1	Option 2	Option 3
AM PEAK HOUR				
EB Greenbag Rd	A	A	A	A
WB Greenbag Rd	A	A	A	A
NB Lower Aarons Creek Rd	C	C	C	D
SB Commercial Dwy	--	--	--	D
Overall Intersection	**A**	**A**	**A**	**A**
PM PEAK HOUR				
EB Greenbag Rd	A	A	A	A
WB Greenbag Rd	A	A	A	A
NB Lower Aarons Creek Rd	C	C	C	C
SB Commercial Dwy	--	--	--	**D**
Overall Intersection	**A**	**A**	**A**	**A**
SATURDAY PEAK HOUR				
EB Greenbag Rd	A	A	A	A
WB Greenbag Rd	A	A	A	A
NB Lower Aarons Creek Rd	B	B	B	B
SB Commercial Dwy	--	--	--	A
Overall Intersection	**A**	**A**	**A**	**A**

Turn Lane - Queue Summary

Approach (Turn Lane)	Turn Lane Length (Feet)			
	Per AASHTO	Per Synchro Analysis Results		
		Option 1	Option 2	Option 3
S-WB Greenbag Rd (Left)	125’	125’	--	125’
EB Greenbag Rd (Right)	--’*	--	--	--

* Turn lane warrant not met.

11.6 Greenbag Road (CR 857) and Diamond Avenue Summary

Proposed Alternative Options

Option	Description
1	• Twelve (12) foot travel lanes on Greenbag Road • Maintaining existing unsignalized operation
2	• Exclusive northbound right turn lane on Greenbag Road • Maintaining existing unsignalized operation
3	• Installation of a two-phase traffic signal

Capacity Analysis Summary

Approach/ Overall Intersection	Level of Service (Delay in Seconds)			
	2048 Design Year Without Improvements	2048 Design Year With Improvements		
		Option 1	Option 2	Option 3
AM PEAK HOUR				
WB Diamond Ave	B	B	B	B
NB Greenbag Rd	A	A	A	A
SB Greenbag Rd	A	A	A	A
Overall Intersection	**A**	**A**	**A**	**A**
PM PEAK HOUR				
WB Diamond Ave	B	B	B	B
NB Greenbag Rd	A	A	A	A
SB Greenbag Rd	A	A	A	A
Overall Intersection	**A**	**A**	**A**	**A**
SATURDAY PEAK HOUR				
WB Diamond Ave	B	B	B	B
NB Greenbag Rd	A	A	A	A
SB Greenbag Rd	A	A	A	A
Overall Intersection	**A**	**A**	**A**	**A**

Turn Lane - Queue Summary

Approach (Turn Lane)	Turn Lane Length (Feet)			
	Per AASHTO	Per Synchro Analysis Results		
		Option 1	Option 2	Option 3
NB Greenbag Rd (Right)	200’	--	125’	--
SB Greenbag Rd (Left)	--’*	--	--	--

* Turn lane warrant not met.

TABLE 1
EXISTING CONDITIONS
CAPACITY ANALYSIS SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Intersection	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1] 2018 Existing Conditions		
			AM Peak Hour	PM Peak Hour	Saturday Peak Hour
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE					
GREENBAG ROAD (CR 837) AND MISSISSIPPI AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (3.0)	A (2.0)	A (0.7)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Mississippi Avenue*	Left Turn/Right Turn	F (109.7)	D (33.5)	B (13.1)
	Overall Intersection		**C (21.3)**	**A (3.9)**	**A (1.3)**
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVENUE (CR 81)					
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVE (CR 81)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	B (17.5)	D (39.3)	B (16.9)
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	B (17.5)	C (24.4)	B (14.7)
	Northbound *Kingwood Pike*	Left Turn/Through/Right Turn	C (30.9)	C (21.0)	B (19.4)
	Southbound *Dorsey Avenue*	Left Turn/Through/Right Turn	C (23.2)	C (27.8)	C (20.2)
	Overall Intersection		**C (22.5)**	**C (30.7)**	**B (17.1)**
GREENBAG ROAD (CR 857) AND LUCKEY LANE					
GREENBAG ROAD (CR 857) AND LUCKEY LANE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Luckey Lane*	Left Turn/Right Turn	C (24.0)	C (21.7)	B(14.5)
	Overall Intersection		**A (1.1)**	**A (1.2)**	**A (1.0)**
GREENBAG ROAD (CR 857) AND RICHARD AVENUE					
GREENBAG ROAD (CR 857) AND RICHARD AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (1.2)	A (0.2)	A (0.2)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Richard Avenue*	Left Turn/Right Turn	C (18.2)	C (15.3)	B (11.7)
	Overall Intersection		**A (2.3)**	**A (0.7)**	**A (0.4)**
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)					
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	A (0.1)	A (0.5)	A (0.2)
	Northbound *Lower Aarons Creek Road*	Left Turn/Through/Right Turn	C (15.4)	B (14.9)	B (10.6)
	Southbound *Commercial Dwy*	Left Turn/Through/Right Turn	N/A	N/A	N/A
	Overall Intersection		**A (0.6)**	**A (0.5)**	**A (0.4)**
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE					
Intersection 4: Main Street (SR 0219) and Main Street	**Westbound** *Diamond Avenue*	Left Turn/Right Turn	B (11.2)	B (11.2)	B (10.1)
	Northbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Greenbag Road*	Left Turn/Through	A (0.0)	A (0.1)	A (0.0)
	Overall Intersection		**A (1.0)**	**A (0.8)**	**A (0.7)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 2
EXISTING CONDITIONS
QUEUE ANALYSIS SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Intersection	Approach *Roadway*	Movement	Existing Queue Capacity	Synchro 95th Percentile Queue Length (Feet)[1] 2018 Existing Conditions		
				AM Peak Hour	PM Peak Hour	Saturday Peak Hour
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE						
GREENBAG ROAD (CR 837) AND MISSISSIPPI AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	395	13	13	3
	Westbound *Greenbag Road*	Through/Right Turn	2,500	0	0	0
	Southbound *Mississippi Avenue*	Left Turn/Right Turn	740	250	63	8
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVENUE (CR 81)						
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVE (CR 81)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	700	230	605	212
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	1,850	246	327	140
	Northbound *Kingwood Pike*	Left Turn/Through/Right Turn	>2,500	403	112	75
	Southbound *Dorsey Avenue*	Left Turn/Through/Right Turn	335	116	303	82
GREENBAG ROAD (CR 857) AND LUCKEY LANE						
GREENBAG ROAD (CR 857) AND LUCKEY LANE	**Eastbound** *Greenbag Road*	Left Turn/Through	1,135	0	0	0
	Westbound *Greenbag Road*	Through/Right Turn	75	0	0	0
	Southbound *Luckey Lane*	Left Turn/Right Turn	925	20	20	10
GREENBAG ROAD (CR 857) AND RICHARD AVENUE						
GREENBAG ROAD (CR 857) AND RICHARD AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	75	5	0	0
	Westbound *Greenbag Road*	Through/Right Turn	540	0	0	0
	Southbound *Richard Avenue*	Left Turn/Right Turn	720	30	10	3
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)						
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	590	0	0	0
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	590	0	3	0
	Northbound *Lower Aarons Creek Road*	Left Turn/Through/Right Turn	>2,500	10	5	3
	Southbound *Commercial Dwy*	Left Turn/Through/Right Turn	150	0	0	0
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE						
Intersection 4: Main Street (SR 0219) and Main Street	**Westbound** *Diamond Avenue*	Left Turn/Right Turn	1,350	13	10	5
	Northbound *Greenbag Road*	Through/Right Turn	590	0	0	0
	Southbound *Greenbag Road*	Left Turn/Through	435	0	0	0

(1) Synchro HCM 2010 95th percentile queue length reported.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

TABLE 3
2048 DESIGN YEAR CONDITIONS WITHOUT IMPROVEMENTS
CAPACITY ANALYSIS SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Intersection	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1] 2048 Design Year Conditions, Without Improvements		
			AM Peak Hour	PM Peak Hour	Saturday Peak Hour
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE					
GREENBAG ROAD (CR 837) AND MISSISSIPPI AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (3.5)	A (2.3)	A (0.7)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Mississippi Avenue*	Left Turn/Right Turn	F (826.4)	F (330.1)	C (17.0)
	Overall Intersection		**F (154.5)**	**D (30.0)**	**A (1.5)**
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVENUE (CR 81)					
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVE (CR 81)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	C (22.6)	F (246.9)	C (20.0)
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	C (21.2)	E (72.9)	B (16.2)
	Northbound *Kingwood Pike*	Left Turn/Through/Right Turn	E (79.7)	C (24.4)	C (20.1)
	Southbound *Dorsey Avenue*	Left Turn/Through/Right Turn	C (28.1)	D (44.3)	C (21.3)
	Overall Intersection		**D (40.7)**	**F (129.1)**	**B (19.1)**
GREENBAG ROAD (CR 857) AND LUCKEY LANE					
GREENBAG ROAD (CR 857) AND LUCKEY LANE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Luckey Lane*	Left Turn/Right Turn	F (52.3)	E (43.5)	C (19.6)
	Overall Intersection		**A (2.5)**	**A (2.4)**	**A (1.4)**
GREENBAG ROAD (CR 857) AND RICHARD AVENUE					
GREENBAG ROAD (CR 857) AND RICHARD AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	A (1.3)	A (0.3)	A (0.2)
	Westbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Richard Avenue*	Left Turn/Right Turn	E (40.8)	C (22.6)	B (13.7)
	Overall Intersection		**A (4.5)**	**A (1.0)**	**A (0.4)**
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)					
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	A (0.1)	A (0.6)	A (0.2)
	Northbound *Lower Aarons Creek Road*	Left Turn/Through/Right Turn	C (22.2)	C (20.9)	B (11.9)
	Southbound *Commercial Dwy*	Left Turn/Through/Right Turn	N/A	N/A	N/A
	Overall Intersection		**A (0.9)**	**A (0.7)**	**A (0.5)**
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE					
GREENBAG ROAD (CR 857) AMD DIAMOND AVENUE	**Westbound** *Diamond Avenue*	Left Turn/Right Turn	B (13.0)	B (13.0)	B (10.9)
	Northbound *Greenbag Road*	Through/Right Turn	A (0.0)	A (0.0)	A (0.0)
	Southbound *Greenbag Road*	Left Turn/Through	A (0.0)	A (0.1)	A (0.0)
	Overall Intersection		**A (1.2)**	**A (0.9)**	**A (0.7)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 4
2048 DESIGN YEAR CONDITIONS WITHOUT IMPROVEMENTS CAPACITY ANALYSIS SUMMARY
QUEUE ANALYSIS SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Intersection	Approach *Roadway*	Movement	Existing Queue Capacity	Synchro 95th Percentile Queue Length (Feet)[1] 2048 Design Year Conditions, Without Improvements		
				AM Peak Hour	PM Peak Hour	Saturday Peak Hour
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE						
GREENBAG ROAD (CR 837) AND MISSISSIPPI AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	395	23	23	3
	Westbound *Greenbag Road*	Through/Right Turn	2,500	0	0	0
	Southbound *Mississippi Avenue*	Left Turn/Right Turn	740	748	288	18
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVENUE (CR 81)						
GREENBAG ROAD (CR 857) AND KINGWOOD PIKE/DORSEY AVE (CR 81)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	700	370	#954	327
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	1,050	378	#634	198
	Northbound *Kingwood Pike*	Left Turn/Through/Right Turn	>2,500	#643	168	101
	Southbound *Dorsey Avenue*	Left Turn/Through/Right Turn	335	196	#535	116
GREENBAG ROAD (CR 857) AND LUCKEY LANE						
GREENBAG ROAD (CR 857) AND LUCKEY LANE	**Eastbound** *Greenbag Road*	Left Turn/Through	1,135	0	0	0
	Westbound *Greenbag Road*	Through/Right Turn	75	0	0	0
	Southbound *Luckey Lane*	Left Turn/Right Turn	925	58	55	20
GREENBAG ROAD (CR 857) AND RICHARD AVENUE						
GREENBAG ROAD (CR 857) AND RICHARD AVENUE	**Eastbound** *Greenbag Road*	Left Turn/Through	75	10	3	0
	Westbound *Greenbag Road*	Through/Right Turn	540	0	0	0
	Southbound *Richard Avenue*	Left Turn/Right Turn	720	93	20	3
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)						
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)	**Eastbound** *Greenbag Road*	Left Turn/Through/Right Turn	590	0	0	0
	Westbound *Greenbag Road*	Left Turn/Through/Right Turn	590	0	5	0
	Northbound *Lower Aarons Creek Road*	Left Turn/Through/Right Turn	>2,500	20	10	5
	Southbound *Commercial Dwy*	Left Turn/Through/Right Turn	150	0	0	0
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE						
Intersection 4: Main Street (SR 0219) and Main Street	**Westbound** *Diamond Avenue*	Left Turn/Right Turn	1,350	20	15	8
	Northbound *Greenbag Road*	Through/Right Turn	590	0	0	0
	Southbound *Greenbag Road*	Left Turn/Through	435	0	0	0

(1) Synchro HCM 2010 95th percentile queue length reported.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 5
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]						
					2048 Design Year Improvement Options				
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	Option 1 - EB Left Turn Lane on Greenbag (Unsignalized)[2]	Option 1A - EB Left Turn Lane on Greenbag & Two-Lane Side Street (Unsignalized)[3]	Option 2 - Roundabout[4][5]	Option 3 - Signalization[6]	Option 3A - Continuous Green T-Intersection Signalized[7]
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE									
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (3.0)	A (3.5)	B (11.3)	B (11.3)	A (7.5)	B (11.4)	C (27.2)
		Through			A (0.0)	A (0.0)		A (4.7)	N/A
		Approach	A (3.0)	A (3.5)	A (3.5)	A (3.5)	A (7.5)	A (6.8)	C (27.2)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.4)	B (15.3)	B (17.5)
		Right Turn			A (0.0)	A (0.0)	A (4.9)	B (10.8)	B (12.3)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.3)	B (14.0)	B (16.0)
	Southbound *Mississippi Avenue*	Left Turn	F (109.7)	F (826.4)	F (276.3)	F (136.7)	B (11.3)	C (29.3)	C (29.3)
		Right Turn				C (22.2)		B (19.6)	B (18.9)
		Approach	F (109.7)	F (826.4)	F (276.3)	F (80.3)	B (11.3)	C (24.5)	C (24.2)
	Overall Intersection		**C (21.3)**	**F (154.5)**	**F (52.4)**	**C (16.0)**	**A (7.1)**	**B (13.7)**	**B (19.3)**
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (2.0)	A (2.3)	B (10.3)	B (10.3)	A (5.8)	A (8.9)	C (20.9)
		Through			A (0.0)	A (0.0)		A (5.6)	N/A
		Approach	A (2.0)	A (2.3)	A (2.3)	A (2.3)	A (5.8)	A (6.4)	C (20.9)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.4)	B (13.5)	B (14.8)
		Right Turn			A (0.0)	A (0.0)	A (4.8)	A (6.6)	B (10.8)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.2)	B (11.7)	B (13.7)
	Southbound *Mississippi Avenue*	Left Turn	D (33.5)	F (330.1)	F (171.3)	F (186.3)	A (5.9)	B (19.3)	C (21.2)
		Right Turn				B (14.8)		B (15.5)	B (15.1)
		Approach	D (33.5)	F (330.1)	F (171.3)	F (79.0)	A (5.9)	B (16.9)	B (17.4)
	Overall Intersection		**A (3.9)**	**D (30.0)**	**C (16.1)**	**A (8.1)**	**A (5.8)**	**A (9.4)**	**B (10.6)**
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.7)	A (0.7)	A (8.3)	A (8.3)	A (5.0)	A (7.5)	B (16.4)
		Through			A (0.0)	A (0.0)		A (5.9)	N/A
		Approach	A (0.7)	A (0.7)	A (0.7)	A (0.7)	A (5.0)	A (6.0)	B (16.4)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (4.5)	B (12.4)	B (12.5)
		Right Turn			A (0.0)	A (0.0)	A (4.2)	A (5.8)	A (9.1)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (4.5)	B (11.7)	B (12.1)
	Southbound *Mississippi Avenue*	Left Turn	B (13.1)	C (17.0)	B (13.9)	C (16.2)	A (4.8)	B (13.5)	B (13.4)
		Right Turn				B (10.9)		B (11.9)	B (11.8)
		Approach	B (13.1)	C (17.0)	B (13.9)	C (13.2)	A (4.8)	B (12.6)	B (12.5)
	Overall Intersection		**A (1.3)**	**A (1.5)**	**A (1.3)**	**A (1.3)**	**A (4.8)**	**A (8.7)**	**B (12.6)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

(2) Option 1, Turn Lanes on Greenbag (Unsignalized) includes an exclusive eastbound left turn lane. The eastbound Greenbag Road approach would then provide an exclusive left turn lane and an exclusive right turn lane. The westbound Greenbag Road approach would then provide a shared through/right turn lane. The Mississippi Avenue approach and traffic control is proposed to remain the same as existing conditions.

(3) Option 1A, Eastbound Left Turn Lane on Greenbag (Unsignalized) & Two-Lane Side Street includes an exclusive eastbound left turn lane and widening southbound Mississippi Avenue approach to provide two (2) lanes, and exclusive left turn lane and an exclusive right turn lane. Traffic control to remain the same as existing conditions.

(4) Option 2, Roundabout, analyzes a roundabout that provides a single lane with an inscribed circle diameter of 130 feet, which includes a 25 foot circulatory roadway width providing a travel lane and truck apron. The eastbound Greenbag Road approach provides one (1) lane for the shared left turn/through movement. The westbound Greenbag Road approach provides two (2) lanes with an exclusive through lane and an exclusive by-pass right turn lane, which is controlled with a yield sign. The southbound Mississippi Avenue approach provides one (1) for the shared left turn/right turn movements.

(5) Capacity calculations performed for the roundabout analysis utlilized SIDRA INTERSECTION 8.0. SIDRA Standard delay model was used. Roundabout LOS method for reporting delay is the same as signalized intersection LOS.

(6) Option 3, Signalization, analyzes a three-phase traffic signal, with a protected/permissive eastbound left turn phase, an eastbound/westbound phase, and a southbound phase. The eastbound Greenbag Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach provides a shared through/right turn lane. The southbound Mississippi Avenue approach provides an exclusive left turn lane and an exclusive right turn lane.

(7) Option 3A, Continuous Green T-Intersection Signalized, analyzes a three-phase traffic signal, with a protected/permissive eastbound left turn phase, a westbound phase, and a southbound phase. The eastbound Greenbag Road throughs traverse the intersection via a delinated lane, which provides a continusous green through the intersections. The eastbound Greenbacg Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach provides an exclusive through and an exclusive right turn lane. The southbound Mississippi Avenue approach provides an exclusive left turn lane and an exclusive right turn lane.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 6
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity	Synchro 95th Percentile Queue Length (Feet)[1]						
						2048 Design Year Improvement Options				
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	Option 1 - EB Left Turn Lane on Greenbag (Unsignalized)[2]	Option 1A - EB Left Turn Lane on Greenbag & Two-Lane Side Street (Unsignalized)[3]	Option 2 - Roundabout[4][5]	Option 3 - Signalization[6]	Option 3A - Continuous Green T-Intersection Signalized[7]
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE										
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	395	13	23	23	23	106	37	50
		Through				0	0		81	0
	Westbound *Greenbag Road*	Through	2,500	0	0	0	0	100	325	384
		Right Turn						33	27	31
	Southbound *Mississippi Avenue*	Left Turn	740	250	748	490	208	117	200	146
		Right Turn					55		38	35
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	395	13	23	23	23	253	47	47
		Through				0	0		213	0
	Westbound *Greenbag Road*	Through	2,500	0	0	0	0	73	291	289
		Right Turn						20	16	31
	Southbound *Mississippi Avenue*	Left Turn	740	63	288	220	33	28	60	61
		Right Turn					20		29	29
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	395	3	3	3	3	79	13	13
		Through				0	0		112	0
	Westbound *Greenbag Road*	Through	2,500	0	0	0	0	35	158	163
		Right Turn						4	8	15
	Southbound *Mississippi Avenue*	Left Turn	740	8	18	13	8	9	28	29
		Right Turn					5		14	14

(1) Synchro HCM 2010 95th percentile queue length reported.

(2) Option 1, Turn Lanes on Greenbag (Unsignalized) includes an exclusive eastbound left turn lane. The eastbound Greenbag Road approach would then provide an exclusive left turn lane and an exclusive right turn lane. The westbound Greenbag Road approach would then provide a shared through/right turn lane. The Mississippi Avenue approach and traffic control is proposed to remain the same as existing conditions.

(3) Option 1A, Eastbound Left Turn Lane on Greenbag (Unsignalized) & Two-Lane Side Street includes an exclusive eastbound left turn lane and widening southbound Mississippi Avenue approach to provide two (2) lanes, and exclusive left turn lane and an exclusive right turn lane. Traffic control to remain the same as existing conditions.

(4) Option 2, Roundabout, analyzes a roundabout that provides a single lane with an inscribed circle diameter of 130 feet, which includes a 25 foot circulatory roadway width providing a travel lane and truck apron. The eastbound Greenbag Road approach provides one (1) lane for the shared left turn/through movement. The westbound Greenbag Road approach provides two (2) lanes with an exclusive through lane and an exclusive by-pass right turn lane, which is controlled with a yield sign. The southbound Mississippi Avenue approach provides one (1) for the shared left turn/right turn movements.

(5) Queue length analysis for the roundabout utlilized SIDRA INTERSECTION 8.0. The 95th percentile queue length is reported.

(6) Option 3, Signalization, analyzes a three-phase traffic signal, with a protected/permissive eastbound left turn phase, an eastbound/westbound phase, and a southbound phase. The eastbound Greenbag Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach provides a shared through/right turn lane. The southbound Mississippi Avenue approach provides an exclusive left turn lane and an exclusive right turn lane.

(7) Option 3A, Continuous Green T-Intersection Signalized, analyzes a three-phase traffic signal, with a protected/permissive eastbound left turn phase, a westbound phase, and a southbound phase. The eastbound Greenbag Road throughs traverse the intersection via a delinated lane, which provides a continusous green through the intersections. The eastbound Greenbacg Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach provides an exclusive through and an exclusive right turn lane. The southbound Mississippi Avenue approach provides an exclusive left turn lane and an exclusive right turn lane.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 7
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]							
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options			2048 Design Year Improvement Options Luckey Lane Terminated		
					Option 1 - Left Turn Lanes on Greenbag[2]	Option 2 - Roundabout[3][4]	Option 3 - Left Turn Lanes All Approaches[5]	Option 1 - Left Turn Lanes on Greenbag[2]	Option 2 - Roundabout[3][4]	Option 3 - Left Turn Lanes All Approaches[5]
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)										
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	B (17.5)	C (22.6)	C (23.8)	B (11.3)	C (20.1)	C (22.9)	B (12.0)	C (24.2)
		Through			C (34.2)	A (5.8)	C (27.5)	C (25.8)	A (6.3)	C (24.0)
		Right Turn								
		Approach	B (17.5)	C (22.6)	C (32.7)	A (6.6)	C (26.4)	C (25.4)	A (7.0)	C (24.0)
	Westbound *Greenbag Road*	Left Turn	B (17.5)	C (21.2)	C (21.0)	B (14.6)	B (18.0)	B (18.0)	B (14.5)	B (17.8)
		Through			E (60.6)	B (12.9)	D (42.9)	F (80.5)	C (20.3)	D (48.5)
		Right Turn								
		Approach	B (17.5)	C (21.2)	E (58.2)	B (13.0)	D (41.4)	E (77.5)	B (19.9)	D (47.0)
	Northbound *Kingwood Pike*	Left Turn	C (30.9)	E (79.7)	D (37.9)	C (32.3)	C (22.4)	F (74.4)	D (44.9)	C (29.0)
		Through					D (52.1)			E (78.0)
		Right Turn								
		Approach	C (30.9)	E (79.7)	D (37.9)	C (32.3)	D (42.2)	E (74.4)	D (44.9)	E (61.5)
	Southbound *Dorsey Avenue*	Left Turn	C (23.2)	C (28.1)	B (18.6)	B (15.2)	C (25.1)	C (32.7)	B (18.5)	D (43.2)
		Through					C (34.3)			D (42.7)
		Right Turn								
		Approach	C (23.2)	C (28.1)	B (18.6)	B (15.2)	C (31.4)	C (32.7)	B (18.5)	D (42.9)
	Overall Intersection		**C (22.5)**	**D (40.7)**	**D (39.6)**	**B (17.6)**	**D (36.3)**	**E (57.1)**	**C (23.7)**	**D (45.0)**
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	D (39.3)	F (246.9)	B (18.9)	A (7.1)	C (20.1)	C (27.7)	B (17.1)	C (31.8)
		Through			F (107.5)	C (20.9)	D (54.6)	F (126.8)	D (45.1)	D (53.2)
		Right Turn								
		Approach	D (39.3)	F (246.9)	F (91.6)	C (15.9)	D (48.4)	F (109.0)	D (40.0)	D (49.3)
	Westbound *Greenbag Road*	Left Turn	C (24.4)	E (72.9)	C (24.1)	B (15.7)	D (38.1)	C (24.8)	B (13.0)	D (35.1)
		Through			C (28.4)	C (25.7)	C (27.6)	F (96.8)	A (9.5)	D (40.5)
		Right Turn								
		Approach	C (24.4)	E (72.9)	C (27.5)	C (23.9)	C (29.7)	F (85.3)	B (10.0)	D (39.7)
	Northbound *Kingwood Pike*	Left Turn	C (21.0)	C (24.4)	C (22.5)	B (14.8)	D (38.0)	C (21.1)	B (16.0)	D (40.9)
		Through					D (40.6)			D (46.1)
		Right Turn								
		Approach	C (21.0)	C (24.4)	C (22.5)	B (14.8)	D (39.7)	C (21.1)	B (16.0)	D (44.4)
	Southbound *Dorsey Avenue*	Left Turn	C (27.8)	D (44.3)	D (53.2)	C (21.4)	C (32.7)	F (92.9)	D (47.0)	C (34.6)
		Through					E (73.9)			E (79.9)
		Right Turn								
		Approach	C (27.8)	D (44.3)	D (53.2)	C (21.4)	E (62.7)	F (92.9)	D (47.0)	E (63.5)
	Overall Intersection		**C (30.7)**	**F (129.1)**	**E (58.0)**	**B (18.2)**	**D (45.8)**	**F (89.5)**	**C (30.1)**	**D (49.2)**
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	B (16.9)	C (20.0)	A (8.9)	B (11.4)	B (12.3)	B (10.2)	A (8.3)	B (12.7)
		Through			B (14.3)	A (5.7)	B (19.6)	B (15.9)	A (7.9)	B (19.6)
		Right Turn								
		Approach	B (16.9)	C (20.0)	B (13.3)	A (6.7)	B (18.2)	B (14.8)	A (7.9)	B (18.3)
	Westbound *Greenbag Road*	Left Turn	B (14.7)	B (16.2)	A (9.6)	B (11.5)	B (13.2)	B (10.6)	A (7.1)	B (13.2)
		Through			B (12.5)	A (5.7)	B (16.7)	B (14.9)	A (6.8)	B (18.1)
		Right Turn								
		Approach	B (14.7)	B (16.2)	B (12.0)	A (6.8)	B (16.1)	B (14.2)	A (6.8)	B (17.4)
	Northbound *Kingwood Pike*	Left Turn	B (19.4)	C (20.1)	B (15.5)	A (9.1)	B (18.3)	B (14.9)	A (8.0)	B (19.1)
		Through					C (21.5)			C (23.5)
		Right Turn								
		Approach	B (19.4)	C (20.1)	B (15.5)	A (9.1)	C (20.3)	B (14.9)	A (8.0)	C (21.9)
	Southbound *Dorsey Avenue*	Left Turn	C (20.2)	C (21.3)	B (16.5)	A (7.8)	B (18.3)	B (16.8)	A (8.5)	B (18.9)
		Through					C (25.6)			C (25.5)
		Right Turn								
		Approach	C (20.2)	C (21.3)	B (16.5)	A (7.8)	C (23.8)	B (16.8)	A (8.5)	C (22.8)
	Overall Intersection		**B (17.1)**	**B (19.1)**	**B (13.8)**	**A (7.2)**	**B (18.8)**	**B (15.0)**	**A (7.7)**	**B (19.3)**

TABLE 7
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

(2) Option 1, Left Turn Lanes on Greenbag Road, includes exclusive left turn lanes on both the eastbound and westbound Greenbag Road approaches. The signal operates with 3-phases, a protected/permissive eastbound/westbound left turn phase, an eastbound/westbound phase, and a northbound/southbound phase.

(3) Capacity calculations performed for the roundabout analysis utiilized SIDRA INTERSECTION 8.0. SIDRA Standard delay model was used. Roundabout LOS method for reporting delay is the same as signalized intersection LOS.

(4) Option 2, Roundabout, analyzes a roundabout that provides two (2) circulating lanes with an inscribed circle diameter of 150 feet, which includes a 38 foot circulatory roadway width providing two (2) travel lanes and truck apron. Both the eastbound and westbound Greenbag Road approaches provides two (2) lanes for an exclusive left turn movement and a shared through/right turn movement. The northbound Kingwood Pike and southbound Dorsey Avenue approaches each provides one (1) lane for the shared left turn/through/right turn movements.

(5) Option 3, Left Turn Lanes on All Approaches, includes exclusive left turn lanes and a shared through/right turn lane on all approaches to the intersection.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 8
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity	Synchro 95th Percentile Queue Length (Feet)[1]								
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options[2]			2048 Design Year Improvement Options Luckey Lane Terminated[3]			
						Option 1 - Left Turn Lanes on Greenbag[4]	Option 2 - Roundabout[5][6]	Option 3 - Left Turn Lanes All Approaches[7]	Option 1 - Left Turn Lanes on Greenbag[4]	Option 2 - Roundabout[5][6]	Option 3 - Left Turn Lanes All Approaches[7]
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)											
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	700	230	370	48	14	47	44	16	45
		Through				399	72	387	331	78	335
		Right Turn									
	Westbound *Greenbag Road*	Left Turn	1,050	246	378	26	9	26	24	9	25
		Through				#543	211	531	#656	394	637
		Right Turn									
	Northbound *Kingwood Pike*	Left Turn	>2,500	403	#643	#610	452	134	#654	580	157
		Through						408			436
		Right Turn									
	Southbound *Dorsey Avenue*	Left Turn	335	230	370	180	105	66	360	151	160
		Through						74			80
		Right Turn									
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	700	605	#954	78	48	97	103	55	134
		Through				#732	517	811	#756	765	811
		Right Turn									
	Westbound *Greenbag Road*	Left Turn	1,050	327	#634	70	26	143	72	27	130
		Through				378	90	438	#655	189	676
		Right Turn									
	Northbound *Kingwood Pike*	Left Turn	>2,500	112	168	184	85	77	172	91	78
		Through						151			167
		Right Turn									
	Southbound *Dorsey Avenue*	Left Turn	335	0	0	#567	272	134	#670	609	204
		Through						479			490
		Right Turn									
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	700	212	327	37	16	48	45	17	48
		Through				234	52	282	267	56	282
		Right Turn									
	Westbound *Greenbag Road*	Left Turn	1,050	140	198	27	10	35	33	10	35
		Through				160	33	190	217	42	229
		Right Turn									
	Northbound *Kingwood Pike*	Left Turn	>2,500	75	101	109	28	50	112	26	50
		Through						77			78
		Right Turn									
	Southbound *Dorsey Avenue*	Left Turn	335	82	116	126	25	43	186	38	79
		Through						102			102
		Right Turn									

(1) Synchro HCM 2010 95th percentile queue length reported.

(2) 2048 Design Year Improvement Options analyses assumes Luckey Lane's intersection at Greenbag Road to remain.

(3) 2048 Design Year Improvement Options With Luckey Lane Termination, assumes Luckey Lane's intersection at Greenbag Road is terminated and assumes Luckey Lane is proposed to be redesigned to insect with Richard Avenue. Location of the proposed Luckey Lane intersection to Richard Avenue is to be determined.

(4) Option 1, Left Turn Lanes on Greenbag Road, includes exclusive left turn lanes on both the eastbound and westbound Greenbag Road approaches. The signal operates with 3-phases, a protected/permissive eastbound/westbound left turn phase, an eastbound/westbound phase, and a northbound/southbound phase.

(5) Queue length analysis for the roundabout utlilized SIDRA INTERSECTION 8.0. The 95th percentile queue length is reported.

(6) Option 2, Roundabout, analyzes a roundabout that provides two (2) circulating lanes with an inscribed circle diameter of 150 feet, which includes a 38 foot circulatory roadway width providing two (2) travel lanes and truck apron. Both the eastbound and westbound Greenbag Road approaches provides two (2) lanes for an exclusive left turn movement and a shared through/right turn movement. The northbound Kingwood Pike and southbound Dorsey Avenue approaches each provides one (1) lane for the shared left turn/through/right turn movements.

(7) Option 3, Left Turn Lanes on All Approaches, includes exclusive left turn lanes and a shared through/right turn lane on all approaches to the intersection.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 9
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND LUCKEY LANE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]		
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options: Option 1: 12-Foot Travel Lanes on Greenbag Road
GREENBAG ROAD (CR 857) AND LUCKEY LANE					
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.0)	A (0.0)	A (0.0)
		Through			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)
		Right Turn			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Southbound *Luckey Lane*	Left Turn	C (24.0)	F (52.3)	F (52.3)
		Right Turn			
		Approach	C (24.0)	F (52.3)	F (52.3)
	Overall Intersection		**A (1.1)**	**A (2.5)**	**A (2.5)**
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.0)	A (0.0)	A (0.0)
		Through			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)
		Right Turn			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Southbound *Luckey Lane*	Left Turn	C (21.7)	E (43.5)	E (43.5)
		Right Turn			
		Approach	C (21.7)	E (43.5)	E (43.5)
	Overall Intersection		**A (1.2)**	**A (2.4)**	**A (2.4)**
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.0)	A (0.0)	A (0.0)
		Through			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)
		Right Turn			
		Approach	A (0.0)	A (0.0)	A (0.0)
	Southbound *Luckey Lane*	Left Turn	B(14.5)	C (19.6)	C (19.6)
		Right Turn			
		Approach	B(14.5)	C (19.6)	C (19.6)
	Overall Intersection		**A (1.0)**	**A (1.4)**	**A (1.4)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 10
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND LUCKEY LANE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity	Synchro 95th Percentile Queue Length (Feet)[1]		
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options
						Option 1: 12-Foot Travel Lanes on Greenbag Road[2]
GREENBAG ROAD (CR 857) AND LUCKEY LANE						
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	1,135	0	0	0
		Through				
	Westbound *Greenbag Road*	Through	75	0	0	0
		Right Turn				
	Southbound *Luckey Lane*	Left Turn	925	20	58	58
		Right Turn				
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	1,135	0	0	0
		Through				
	Westbound *Greenbag Road*	Through	75	0	0	0
		Right Turn				
	Southbound *Luckey Lane*	Left Turn	925	20	55	55
		Right Turn				
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	1,135	0	0	0
		Through				
	Westbound *Greenbag Road*	Through	75	0	0	0
		Right Turn				
	Southbound *Luckey Lane*	Left Turn	925	10	20	20
		Right Turn				

(1) Synchro HCM 2010 95th percentile queue length reported.
(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 11
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND RICHARD AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]			
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options	
					Option 1: Widen Greenbag Road 12' Travel Lanes[2]	Option 2: Luckey Lane Termination at Greenbag Road[3]
GREENBAG ROAD (CR 857) AND RICHARD AVENUE						
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (1.2)	A (1.3)	A (1.3)	B (10.3)
		Through				A (0.0)
		Approach	A (1.2)	A (1.3)	A (1.3)	A (1.4)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Right Turn				A (0.0)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	Southbound *Richard Avenue*	Left Turn	C (18.2)	E (40.8)	E (40.8)	E (35.3)
		Right Turn				
		Approach	C (18.2)	E (40.8)	E (40.8)	E (35.3)
	Overall Intersection		**A (2.3)**	**A (4.5)**	**A (4.5)**	**A (4.1)**
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.2)	A (0.3)	A (0.3)	A (9.2)
		Through				A (0.0)
		Approach	A (0.2)	A (0.3)	A (0.3)	A (0.3)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Right Turn				A (0.0)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	Southbound *Richard Avenue*	Left Turn	C (15.3)	C (22.6)	C (22.6)	C (22.9)
		Right Turn				
		Approach	C (15.3)	C (22.6)	C (22.6)	C (22.9)
	Overall Intersection		**A (0.7)**	**A (1.0)**	**A (1.0)**	**A (1.1)**
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	A (0.2)	A (0.2)	A (0.2)	A (8.2)
		Through				A (0.0)
		Approach	A (0.2)	A (0.2)	A (0.2)	A (0.2)
	Westbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		Right Turn				A (0.0)
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	Southbound *Richard Avenue*	Left Turn	B (11.7)	B (13.7)	B (13.6)	B (14.0)
		Right Turn				
		Approach	B (11.7)	B (13.7)	B (13.6)	B (14.0)
	Overall Intersection		**A (0.4)**	**A (0.4)**	**A (0.3)**	**A (0.4)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Luckey Lane Termination at Greenbag Road, includes rerouting of Luckey Lane traffic to either Greenbag Road/Dorsey Avenue/Kingwood Pike intersection or Greenbag Road/Richard Avenue intersection. Intersection improvements includes widening Greenbag Road to provide an exclusive left turn lane and through lane on the eastbound Greenbag Road approach and to provide an exclusive through lane and an exclusive right tur lane on westbound Greenbag Road approach.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 12
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND RICHARD AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity	95th Percentile Queue Length (Feet)[1]			
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options	
						Option 1: Widen Greenbag Road 12' Travel Lanes[2]	Option 2: Luckey Lane Termination at Greenbag Road[3]
GREENBAG ROAD (CR 857) AND RICHARD AVENUE							
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	75	5	10	10	10
		Through					0
	Westbound *Greenbag Road*	Through	540	0	0	0	0
		Right Turn					0
	Southbound *Richard Avenue*	Left Turn	720	30	93	93	83
		Right Turn					
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	75	0	3	3	3
		Through					0
	Westbound *Greenbag Road*	Through	540	0	0	0	0
		Right Turn					0
	Southbound *Richard Avenue*	Left Turn	720	10	20	20	23
		Right Turn					
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	75	0	0	0	0
		Through					0
	Westbound *Greenbag Road*	Through	540	0	0	0	0
		Right Turn					0
	Southbound *Richard Avenue*	Left Turn	720	3	3	3	5
		Right Turn					

(1) Synchro HCM 2010 95th percentile queue length reported.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Luckey Lane Termination at Greenbag Road, includes rerouting of Luckey Lane traffic to either Greenbag Road/Dorsey Avenue/Kingwood Pike intersection or Greenbag Road/Richard Avenue intersection. Intersection improvements includes widening Greenbag Road to provide an exclusive left turn lane and through lane on the eastbound Greenbag Road approach and to provide an exclusive through lane and an exclusive right tur lane on westbound Greenbag Road approach.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 13
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]				
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options		
					Option 1: Warranted Left Turn Lane on Greenbag Road[2]	Option 2: 12' Travel Lanes on Greenbag Road[3]	Option 3: Commercial Driveway 4th Leg[4]
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)							
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	N/A	N/A	N/A	N/A	A (0.1)
		Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	
		Right Turn					
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.1)
	Westbound *Greenbag Road*	Left Turn	A (0.1)	A (0.1)	A (9.2)	A (0.1)	A (9.2)
		Through			A (0.0)		A (0.0)
		Right Turn	N/A	N/A	N/A	N/A	
		Approach	A (0.1)	A (0.1)	A (0.1)	A (0.1)	A (0.1)
	Northbound *Lower Aarons Creek Road*	Left Turn	C (15.4)	C (22.2)	C (22.1)	C (22.2)	D (28.3)
		Right Turn					
		Through	N/A	N/A	N/A	N/A	
		Approach	C (15.4)	C (22.2)	C (22.1)	C (22.2)	D (28.3)
	Southbound *Commercial Dwy*	Left Turn	N/A	N/A	N/A	N/A	D (33.0)
		Through					
		Right Turn					
		Approach	N/A	N/A	N/A	N/A	D (33.0)
	Overall Intersection		**A (0.6)**	**A (0.9)**	**A (0.9)**	**A (0.9)**	**A (1.3)**
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	N/A	N/A	N/A	N/A	A (0.1)
		Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	
		Right Turn					
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.1)
	Westbound *Greenbag Road*	Left Turn	A (0.5)	A (0.6)	A (9.4)	A (0.6)	A (9.4)
		Through			A (0.0)		A (0.0)
		Right Turn	N/A	N/A	N/A	N/A	
		Approach	A (0.5)	A (0.6)	A (0.6)	A (0.6)	A (0.6)
	Northbound *Lower Aarons Creek Road*	Left Turn	B (14.9)	C (20.9)	C (20.4)	C (20.9)	C (24.8)
		Right Turn					
		Through	N/A	N/A	N/A	N/A	
		Approach	B (14.9)	C (20.9)	C (20.4)	C (20.9)	C (24.8)
	Southbound *Commercial Dwy*	Left Turn	N/A	N/A	N/A	N/A	D (28.5)
		Through					
		Right Turn					
		Approach	N/A	N/A	N/A	N/A	D (28.5)
	Overall Intersection		**A (0.5)**	**A (0.7)**	**A (0.7)**	**A (0.7)**	**A (1.1)**
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	N/A	N/A	N/A	N/A	A (0.0)
		Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	
		Right Turn					
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	Westbound *Greenbag Road*	Left Turn	A (0.2)	A (0.2)	A (8.3)	A (0.2)	A (8.3)
		Through			A (0.0)		A (0.0)
		Right Turn	N/A	N/A	N/A	N/A	
		Approach	A (0.2)	A (0.2)	A (0.2)	A (0.2)	A (0.2)
	Northbound *Lower Aarons Creek Road*	Left Turn	B (10.6)	B (11.9)	B (11.9)	B (11.9)	B (12.2)
		Right Turn					
		Through	N/A	N/A	N/A	N/A	
		Approach	B (10.6)	B (11.9)	B (11.9)	B (11.9)	B (12.2)
	Southbound *Commercial Dwy*	Left Turn	N/A	N/A	N/A	N/A	A (0.0)
		Through					
		Right Turn					
		Approach	N/A	N/A	N/A	N/A	A (0.0)
	Overall Intersection		**A (0.4)**	**A (0.5)**	**A (0.5)**	**A (0.5)**	**A (0.5)**

TABLE 13
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010* , by the Transportation Research Board.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Turn Lanes on Greenbag (Unsignalized) includes an exclusive westbound left turn lane on Greenbag Road, based on the turn lane warrants. Lower Aarons Creek Road approach and traffic control to remain the same as existing conditions.

(4) Option 3, Commercial Dwy 4th Leg, includes consolidating the open parking lot/access to the existing development on the north/west side of the Greenbag Road and Lowers Aaron Creek Road intersection to provide a delineated driveway access, as a 4th leg to the intersection.

Note: N/A denotes that a delineated movement does not occur and was not analyzed for the analysis option.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 14
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity	95th Percentile Queue Length (Feet)[1]				
						2048 Design Year Improvement Options		
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	Option 1: Warranted Left Turn Lane on Greenbag Road[2]	Option 2: 12' Travel Lanes on Greenbag Road[3]	Option 3: Commercial Driveway 4th Leg[4]
GREENBAG ROAD (CR 857) AND LOWER AARONS CREEK ROAD (CR 64)								
AM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	590	N/A	N/A	N/A	N/A	0
		Through		0	0	0	0	
		Right Turn						
	Westbound *Greenbag Road*	Left Turn	590	0	0	0	0	0
		Through				0		0
		Right Turn		N/A	N/A	N/A	N/A	
	Northbound *Lower Aarons Creek Road*	Left Turn	>2,500	10	20	20	20	25
		Right Turn						
		Through		N/A	N/A	N/A	N/A	
	Southbound *Commercial Dwy*	Left Turn	150	N/A	N/A	N/A	N/A	5
		Through						
		Right Turn						
PM PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	590	N/A	N/A	N/A	N/A	0
		Through		0	0	0	0	
		Right Turn						
	Westbound *Greenbag Road*	Left Turn	590	3	5	5	5	5
		Through				0		0
		Right Turn		N/A	N/A	N/A	N/A	
	Northbound *Lower Aarons Creek Road*	Left Turn	>2,500	5	10	10	10	13
		Right Turn						
		Through		N/A	N/A	N/A	N/A	
	Southbound *Commercial Dwy*	Left Turn	150	N/A	N/A	N/A	N/A	5
		Through						
		Right Turn						
SATURDAY PEAK HOUR	**Eastbound** *Greenbag Road*	Left Turn	590	N/A	N/A	N/A	N/A	0
		Through		0	0	0	0	
		Right Turn						
	Westbound *Greenbag Road*	Left Turn	590	0	0	0	0	0
		Right Turn				0		0
		Through		N/A	N/A	N/A	N/A	
	Northbound *Lower Aarons Creek Road*	Left Turn	>2,500	3	5	5	5	5
		Through						
		Right Turn		N/A	N/A	N/A	N/A	
	Southbound *Commercial Dwy*	Left Turn	150	N/A	N/A	N/A	N/A	0
		Through						
		Right Turn						

(1) Synchro HCM 2010 95th percentile queue length reported.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Turn Lanes on Greenbag (Unsignalized) includes an exclusive westbound left turn lane on Greenbag Road. Lower Aarons Creek Road approach and traffic control to remain the same as existing conditions.

(4) Option 3, Commercial Driveway 4th Leg, includes consolidating the open parking lot/access to the existing development on the north/west side of the Greenbag Road and Lowers Aaron Creek Road intersection to provide a delineated driveway access, as a 4th leg to the intersection.

Note: N/A denotes that a delineated movement does not occur and was not analyzed for the analysis option.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 15
CAPACITY ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Level of Service (Delay in Seconds)[1]				
			2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options		
					Option 1: Widen Greenbag Road 12' Travel Lanes[2]	Option 2: Warranted Turn Lanes[3]	Option 3: Installation of Traffic Signal[4]
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE							
AM PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	B (11.2)	B (13.0)	B (13.0)	B (12.8)	B (18.4)
		Right Turn					
		Approach	B (11.2)	B (13.0)	B (13.0)	B (12.8)	B (18.4)
	Northbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (7.1)
		Right Turn				A (0.0)	
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (7.1)
	Southbound *Greenbag Road*	Left Turn	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.2)
		Through					
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.2)
	Overall Intersection		**A (1.0)**	**A (1.2)**	**A (1.2)**	**A (1.2)**	**A (7.5)**
PM PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	B (11.2)	B (13.0)	B (13.0)	B (12.6)	B (16.9)
		Right Turn					
		Approach	B (11.2)	B (13.0)	B (13.0)	B (12.6)	B (16.9)
	Northbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (6.8)
		Right Turn				A (0.0)	
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (6.8)
	Southbound *Greenbag Road*	Left Turn	A (0.1)	A (0.1)	A (0.1)	A (0.1)	A (5.9)
		Through					
		Approach	A (0.1)	A (0.1)	A (0.1)	A (0.1)	A (5.9)
	Overall Intersection		**A (0.8)**	**A (0.9)**	**A (0.9)**	**A (0.9)**	**A (7.1)**
SATURDAY PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	B (10.1)	B (10.9)	B (10.9)	B (10.8)	B (13.9)
		Right Turn					
		Approach	B (10.1)	B (10.9)	B (10.9)	B (10.8)	B (13.9)
	Northbound *Greenbag Road*	Through	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (6.2)
		Right Turn				A (0.0)	
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (6.2)
	Southbound *Greenbag Road*	Left Turn	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.1)
		Through					
		Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (5.1)
	Overall Intersection		**A (0.7)**	**A (0.7)**	**A (0.7)**	**A (0.7)**	**A (6.3)**

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 2010*, by the Transportation Research Board.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Warranted Turn Lanes, includes an exclusive northbound right turn lane per the turn lane warrants. Diamond Avenue approach and traffic control to remain the same as existing conditions.

(4) Option 3, Installation of Traffic Signal, includes a two-phase signal, based on Peak Hour and Four Hour Warrants.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 16
QUEUE ANALYSIS SUMMARY
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

PEAK HOUR	Approach *Roadway*	Movement	Existing Queue Capacity[2]	95th Percentile Queue Length (Feet)[1]				
				2018 Existing Conditions	2048 Design Year Conditions Without Improvements	2048 Design Year Improvement Options		
						Option 1: Widen Greenbag Road 12' Travel Lanes[2]	Option 2: Warranted Turn Lanes[3]	Option 3: Installation of Traffic Signal[4]
GREENBAG ROAD (CR 857) AND DIAMOND AVENUE								
AM PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	1,350	13	20	20	20	91
		Right Turn						
	Northbound *Greenbag Road*	Through	590	0	0	0	0	266
		Right Turn					0	
	Southbound *Greenbag Road*	Left Turn	435	0	0	0	0	153
		Right Turn						
PM PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	1,350	10	15	15	15	72
		Right Turn						
	Northbound *Greenbag Road*	Through	590	0	0	0	0	231
		Right Turn					0	
	Southbound *Greenbag Road*	Left Turn	435	0	0	0	0	205
		Right Turn						
SATURDAY PEAK HOUR	**Westbound** *Diamond Avenue*	Left Turn	1,350	5	8	8	8	44
		Right Turn						
	Northbound *Greenbag Road*	Through	590	0	0	0	0	139
		Right Turn					0	
	Southbound *Greenbag Road*	Left Turn	435	0	0	0	0	86
		Right Turn						

(1) Synchro HCM 2010 95th percentile queue length reported.

(2) Option 1, Widen Greenbag Road to provide 12 foot wide travel lanes with 4 foot wide shoulders.

(3) Option 2, Warranted Turn Lanes, includes an exclusive northbound right turn lane per the turn lane warrants. Diamond Avenue approach and traffic control to remain the same as existing conditions.

(4) Option 3, Installation of Traffic Signal, includes a two-phase signal, based on Peak Hour and Four Hour Warrants.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 17
TURN LANE WARRANT SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Roadway	Direction	Turn Lane	Turn Lane Warranted?[1]									Warranted Turn Lane Length per AASHTO[2]
			2018 Existing Conditions			2048 Design Year Conditions Without Improvements			2048 Design Year Conditions With Luckey Lane Termination to Greenbag			
			AM Peak Hour	PM Peak Hour	Saturday Peak Hour	AM Peak Hour	PM Peak Hour	Saturday Peak Hour	AM Peak Hour	PM Peak Hour	Saturday Peak Hour	
Greenbag Road (CR 857) and Mississippi Avenue												
Greenbag Road (CR 857)[3]	Eastbound	Left Turn Lane	**Yes**	**Yes**	No	**Yes**	**Yes**	**Yes**	--	--	--	250'
	Westbound	Right Turn Lane	**Yes**	**Yes**	No	**Yes**	**Yes**	No	--	--	--	325'
Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)												
Greenbag Road (CR 857)	Eastbound	Left Turn Lane	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	250'
		Right Turn Lane	No	**Yes**	No	No	**Yes**	**Yes**	No	**Yes**	**Yes**	250'
	Westbound	Left Turn Lane	No	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	200'
		Right Turn Lane	No	No	No	No	No	No	**Yes**	**Yes**	No	325'
Kingwood Pike	Northbound	Left Turn Lane	**Yes**	No	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No	250'
		Right Turn Lane	**Yes**	No	No	**Yes**	No	No	**Yes**	No	No	250'
Dorsey Avenue	Southbound	Left Turn Lane	No	**Yes**	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No	350'
		Right Turn Lane	No	No	No	No	**Yes**	No	**Yes**	**Yes**	No	275'
Greenbag Road (CR 857) and Luckey Lane												
Greenbag Road (CR 857)	Eastbound	Left Turn Lane	No	No	No	No	No	No	--	--	--	--
	Westbound	Right Turn Lane	**Yes**	**Yes**	No	**Yes**	**Yes**	No	--	--	--	225'
Greenbag Road (CR 857) and Richard Avenue												
Greenbag Road (CR 857)	Eastbound	Left Turn Lane	**Yes**	No	No	**Yes**	**Yes**	No	**Yes**	**Yes**	No	150'
	Westbound	Right Turn Lane	No	No	No	**Yes**	No	No	**Yes**	No	No	125'
Greenbag Road (CR 857) and Lower Aarons Creek Road (CR 64)												
Greenbag Road (CR 857)	Eastbound	Right Turn Lane	No	No	No	No	No	No	--	--	--	--
	Westbound	Left Turn Lane	No	**Yes**	No	No	**Yes**	No	--	--	--	125'
Greenbag Road (CR 857) and Diamond Avenue												
Greenbag Road (CR 857)	Northbound	Right Turn Lane	No	**Yes**	No	**Yes**	**Yes**	No	--	--	--	200'
	Southbound	Left Turn Lane	No	No	No	No	No	No	--	--	--	--

(1) Guidelines for the provision of left turn lanes were evaluated in accordance with the procedure in the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets* , the latest edition. Guidelines for the provision of right turn lanes were evaluated in accordance with the procedure in the National Cooperative Highway Report Program (NCHRP) Report 457.

(2) Warranted turn lane length calculated per AASHTO.

(3) In addition to Weekday AM, Weekday PM, and Saturday peak hour warrants, turn lane warrants were completed for twelve (12) consecutive hours, 7:00 AM through 7:00 PM. Summary of turn lane warrants for consecutive 12-hours are summarized on Table 18.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 18
TURN LANE WARRANT SUMMARY
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Time of Day (Hour)	Turn Lane Warranted?[1]			
	2019 Existing Conditions		2048 Design Year Conditions	
	Greenbag Road		Greenbag Road	
	Eastbound Left Turn Lane	Westbound Right Turn Lane	Eastbound Left Turn Lane	Westbound Right Turn Lane
Greenbag Road (CR 857) and Mississippi Avenue				
7:00 AM	**YES**	**YES**	**YES**	**YES**
8:00 AM	No	**YES**	No	**YES**
9:00 AM	No	No	No	No
10:00 AM	No	No	**YES**	No
11:00 AM	No	No	**YES**	No
12:00 PM	No	No	**YES**	No
1:00 PM	**YES**	No	**YES**	No
2:00 PM	**YES**	No	**YES**	**YES**
3:00 PM	**YES**	No	**YES**	No
4:00 PM	**YES**	No	**YES**	**YES**
5:00 PM	**YES**	No	**YES**	No
6:00 PM	No	No	**YES**	No
Warranted Turn Lane Length per AASHTO[2]	**150'**	**250'**	**200'**	**325'**

(1) Guidelines for the provision of left turn lanes were evaluated in accordance with the procedure in the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets*, the latest edition. Guidelines for the provision of right turn lanes were evaluated in accordance with the procedure in the National Cooperative Highway Report Program (NCHRP) Report 457.

(2) Warranted turn lane length calculated per AASHTO.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 19
SIGNAL WARRANT SUMMARY
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Signal Warranted?[1]								
2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Terminated at Greenbag Road		
Warrant 1 Eight Hour	Warrant 2 Four Hour	Warrant 3 Peak Hour	Warrant 1 Eight Hour	Warrant 2 Four Hour	Warrant 3 Peak Hour	Warrant 1 Eight Hour	Warrant 2 Four Hour	Warrant 3 Peak Hour
Greenbag Road (CR 857) and Mississippi Avenue[2]								
No	**Yes**	**Yes - AM, PM**	**Yes - Condition B**	**Yes**	**Yes - AM, PM**	N/A	N/A	N/A
Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)								
N/A (Intersection Signalized)								
Greenbag Road (CR 857) and Luckey Lane								
N/A	No	No	N/A	**Yes**	**Yes - PM**	N/A	N/A	N/A
Greenbag Road (CR 857) and Richard Avenue								
N/A	No	No	N/A	No	**Yes - AM**	N/A	No	**Yes - AM**
Greenbag Road (CR 857) and Lower Aarons Creek Road (CR 64)								
N/A	No	No	N/A	No	No	N/A	N/A	N/A
Greenbag Road (CR 857) and Diamond Avenue								
N/A	No	No	N/A	**Yes**	**Yes - AM, PM**	N/A	N/A	N/A

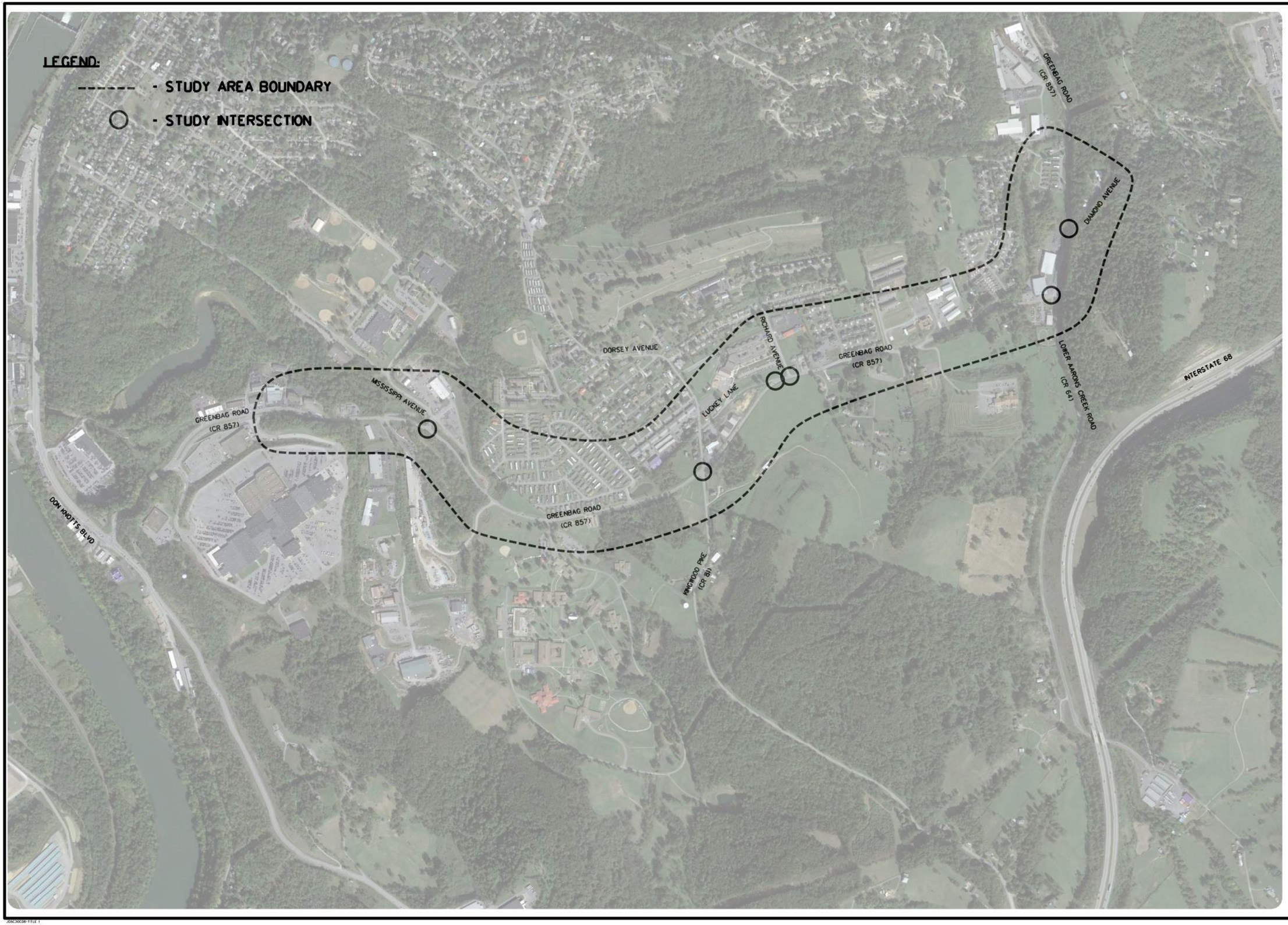
(1) Signal warrants were evaluated per criteria in the Federal Highway Administration (FHWA) *Manual on Uniform Traffic Control Devices, 2009 Edition* (MUTCD).

(2) Warrant 1, Eight Hour Warrant, was completed for the intersection of Greenbag Road (CR 857) and Mississippi Road utilizing the concesecutive twelve (12) hours, 7:00 AM through 7:00 PM. Warrant 1, Eight Hour Warrant, is met under 2048 Design Year Conditions, for Condition B only. Condition B, The Interuption of Continuous Traffic, is intended for application at locations where Condition A, The Minimum Vehicular Volume, is not satisfied and where traffic volumes on the major street is so heavy that traffic on a minor intersectiong street suffers excessive delay or conflict in entering or crossing the major street.

Note: N/A denoted scenario was not analyzed for the condition reported.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

FIGURES



STAHL SHEAFFER ENGINEERING
400 ALLEN DRIVE, SUITE 100
CHARLESTON, WV 25302
PH: 681-265-8342
FAX: 681-255-3844
WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

STUDY AREA

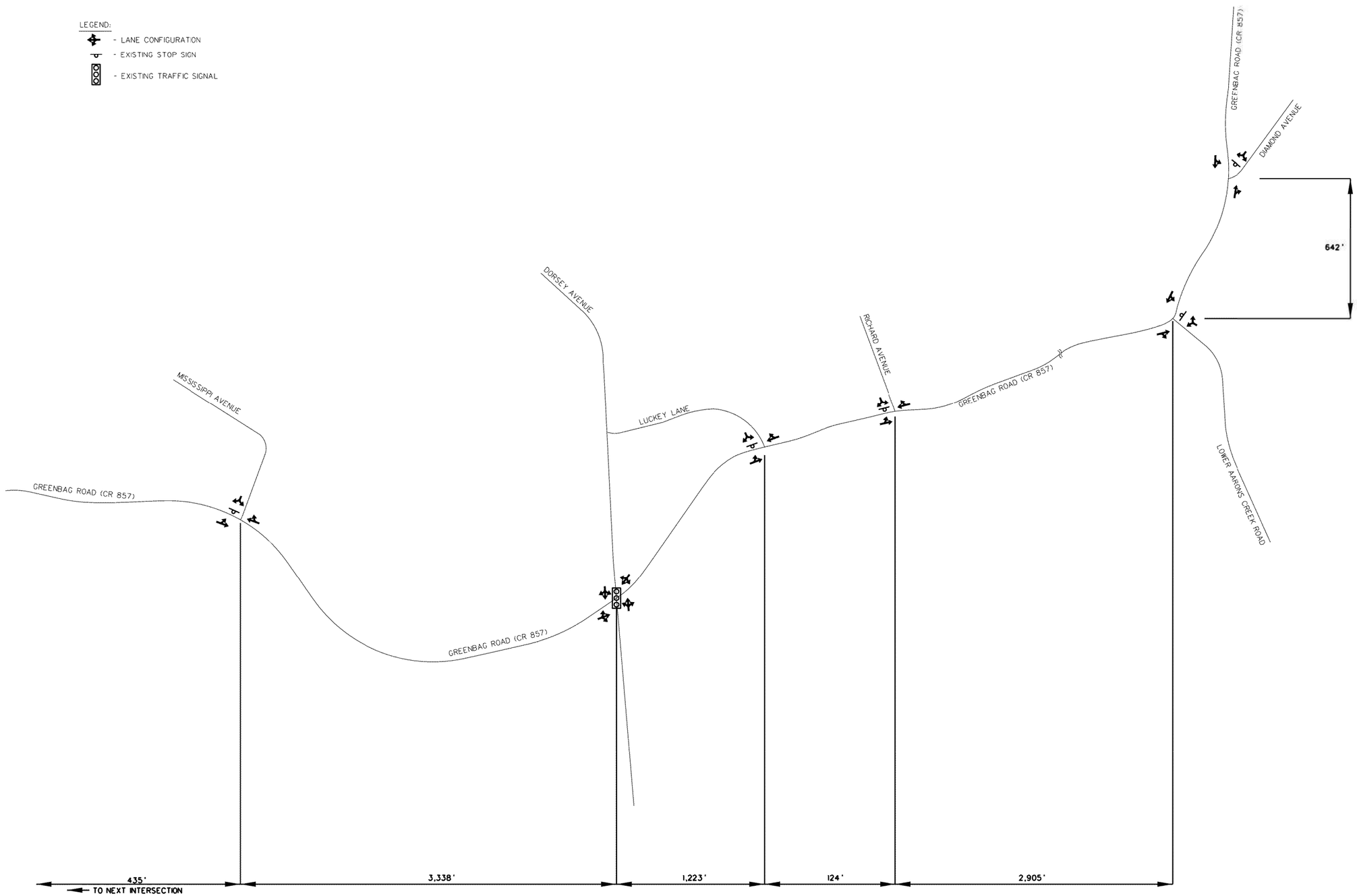
PROJECT NO.
18-141

DATE
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 1

LEGEND:

- LANE CONFIGURATION
- EXISTING STOP SIGN
- EXISTING TRAFFIC SIGNAL



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FAX: 681-255-3844
WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

STUDY INTERSECTIONS AND EXISTING ROADWAY CONFIGURATION

PROJECT NO.

18-141

DATE

NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 2

J05C30C08-TITLE 1

DD-MM-YYYY HH:MM

$USERNAME



LEGEND:

100 - AM PEAK HOUR TRAFFIC VOLUME

(100) - PM PEAK HOUR TRAFFIC VOLUME

[100] - SATURDAY PEAK HOUR TRAFFIC VOLUME

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400 ALLEN DRIVE, SUITE 100
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SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

2018 EXISTING CONDITIONS PEAK HOUR TRAFFIC VOLUMES

PROJECT NO.

18-141

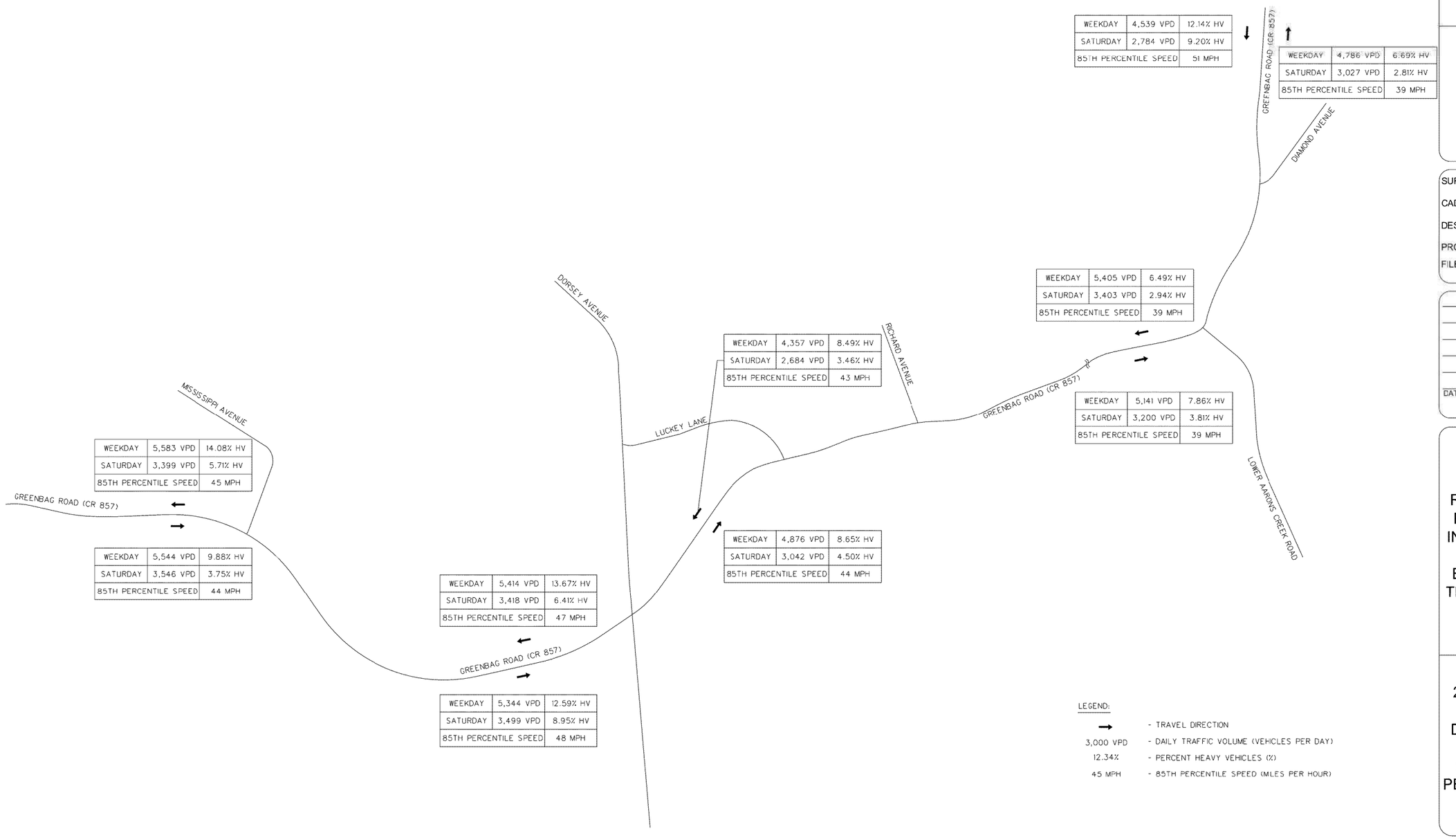
DATE

NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 3

J:\SSE\18-141\CAD\18-141 FIG3.DWG

J:\SSE\18-141\CAD\18-141 FIG3.DWG



STAHL SHEAFFER ENGINEERING
400 ALLEN DRIVE, SUITE 100
CHARLESTON, WV 25302
PH: 681-265-8342
FAX: 681-255-3844
WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

2018 EXISTING CONDITIONS DAILY TRAFFIC VOLUME, SPEEDS, AND PERCENT HEAVY VEHICLES

PROJECT NO.
18-141

DATE
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 4

J:\SSE\JOBS\18-141\CAD\FIGURES\18-141 FIG 4.DWG
DD-MM-YYYY HH:MM
$USERNAME$



LEGEND:

100 - AM PEAK HOUR TRAFFIC VOLUME

(100) - PM PEAK HOUR TRAFFIC VOLUME

[100] - SATURDAY PEAK HOUR TRAFFIC VOLUME

STAHL SHEAFFER ENGINEERING

400 ALLEN DRIVE, SUITE 100
CHARLESTON, WV 25302

PH: 681-265-8342
FAX: 681-255-3844

WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES

PROJECT NO.

18-141

DATE

NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 5

J:\SSE\18\18-141\CAD\FIGURES\FIG 5 - FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES.DWG



LEGEND:

100 - AM PEAK HOUR TRAFFIC VOLUME

(100) - PM PEAK HOUR TRAFFIC VOLUME

[100] - SATURDAY PEAK HOUR TRAFFIC VOLUME

STAHL SHEAFFER ENGINEERING

400 ALLEN DRIVE, SUITE 100
CHARLESTON, WV 25302

PH: 681-265-8342
FAX: 681-255-3844

WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

REROUTED LUCKEY LANE PEAK HOUR TRAFFIC VOLUMES DESIGN YEAR 2048

PROJECT NO.

18-141

DATE

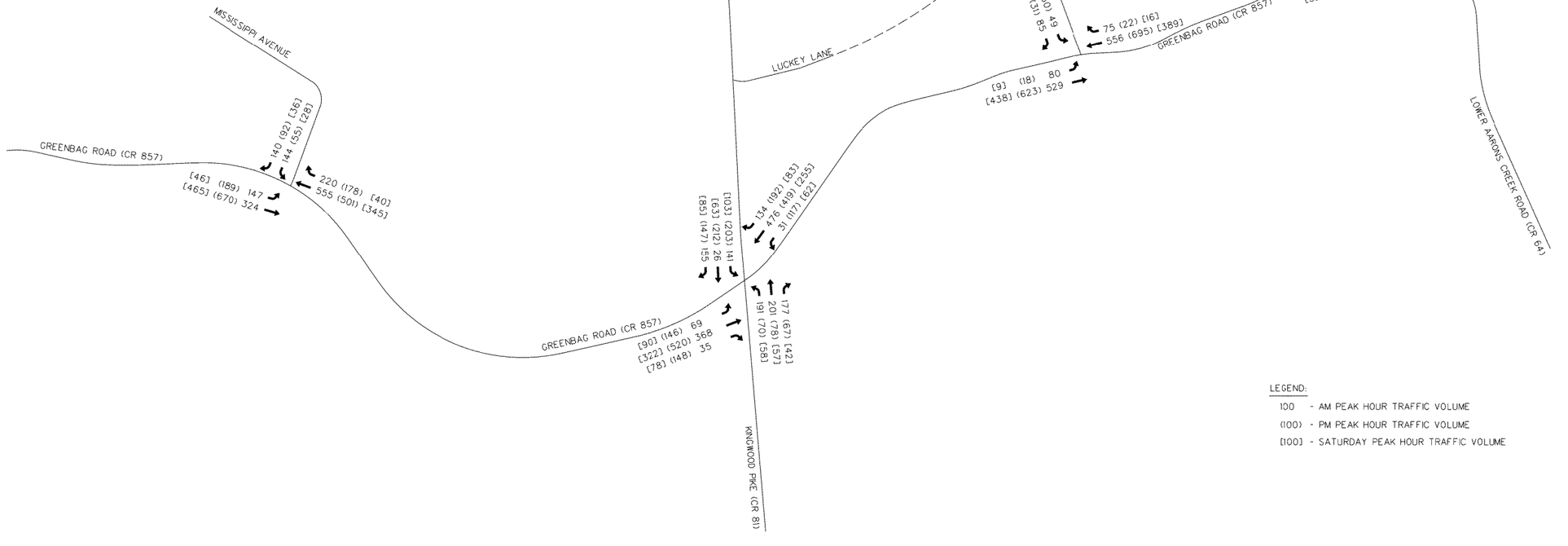
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 6

J05C30C08-TITLE 1

DD-MM-YYYY HH:MM

$USERNAME$



LEGEND:

100 - AM PEAK HOUR TRAFFIC VOLUME

(100) - PM PEAK HOUR TRAFFIC VOLUME

[100] - SATURDAY PEAK HOUR TRAFFIC VOLUME

STAHL SHEAFFER ENGINEERING

400 ALLEN DRIVE, SUITE 100
CHARLESTON, WV 25302

PH: 681-265-8342
FAX: 681-255-3844

WWW.SSE-LLC.COM

SEAL:

SURVEYOR

CADD MDS

DESIGNER

PROJ. MANAGER WJW

FILE:

DATE DESCRIPTION

REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES WITH REROUTED LUCKEY LANE TRAFFIC

PROJECT NO.

18-141

DATE

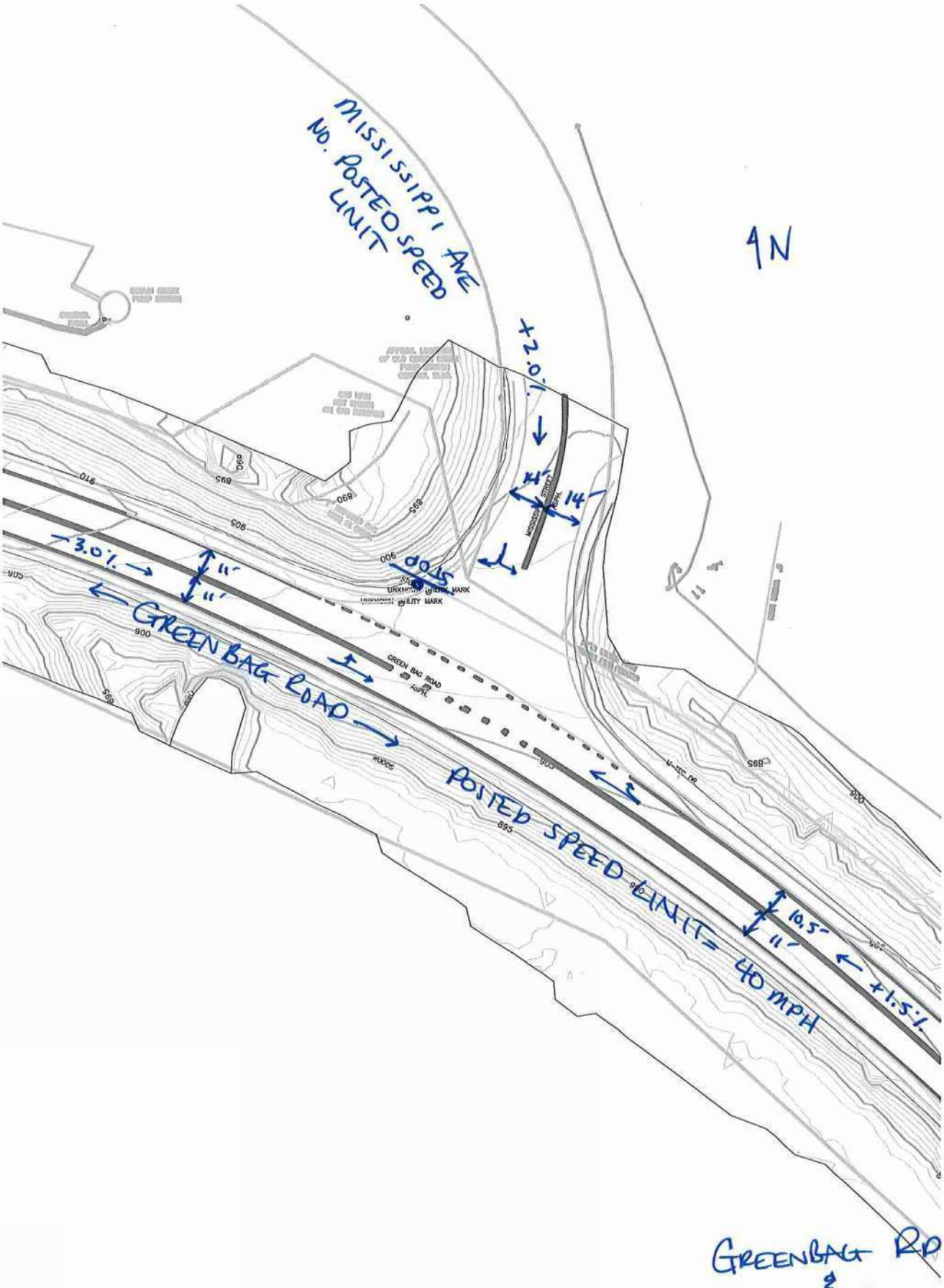
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 7

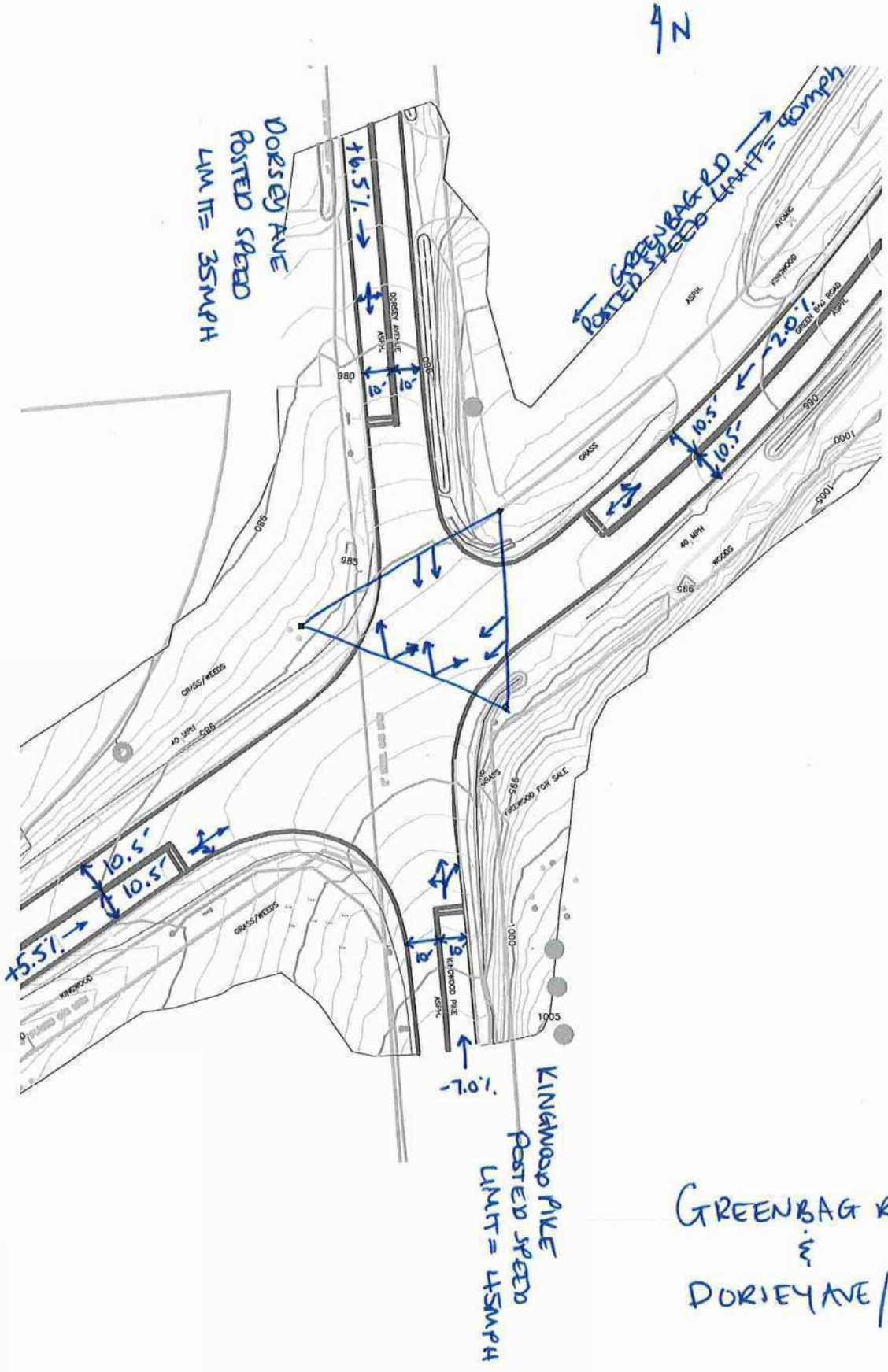
J:\SSE\JOBS\18-141\CAD\PRELIM\FIG 7 - FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES WITH REROUTED LUCKEY LANE TRAFFIC.DWG 11/30/2018 10:19:44 AM

J:\SSE\JOBS\18-141\CAD\PRELIM\FIG 7 - FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES WITH REROUTED LUCKEY LANE TRAFFIC.DWG

Appendix A. Field Notes, Signal Plan and Timings, and Intersection Photographs

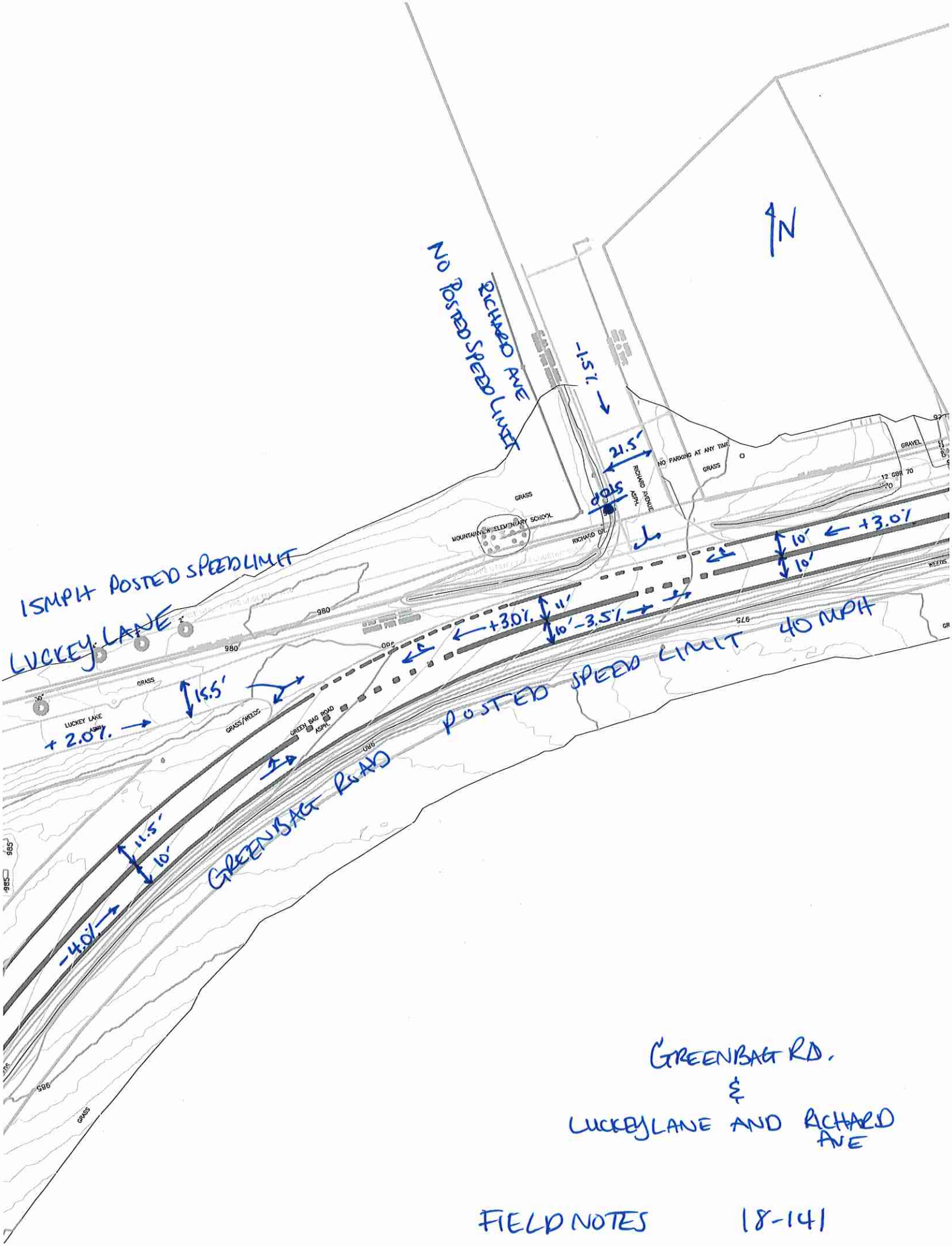


FIELD NOTES 18-141



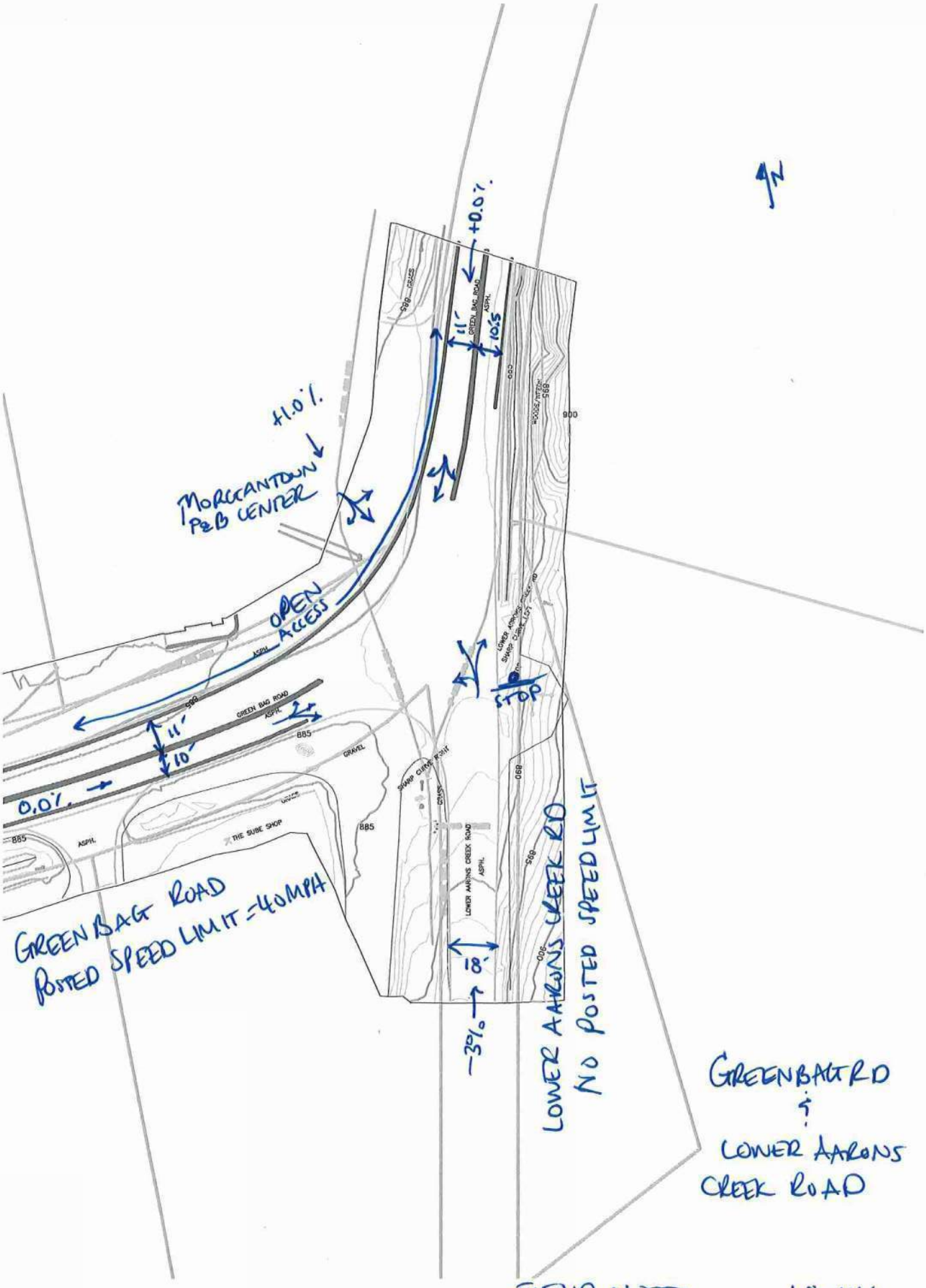
GREENBAG RD
&
DORIEY AVE / KINGWOOD PIKE

FIELD NOTES 18-141



GREENBAG RD.
&
LUCKEY LANE AND RICHARD AVE

FIELD NOTES 18-141



FIELD NOTES 18-141

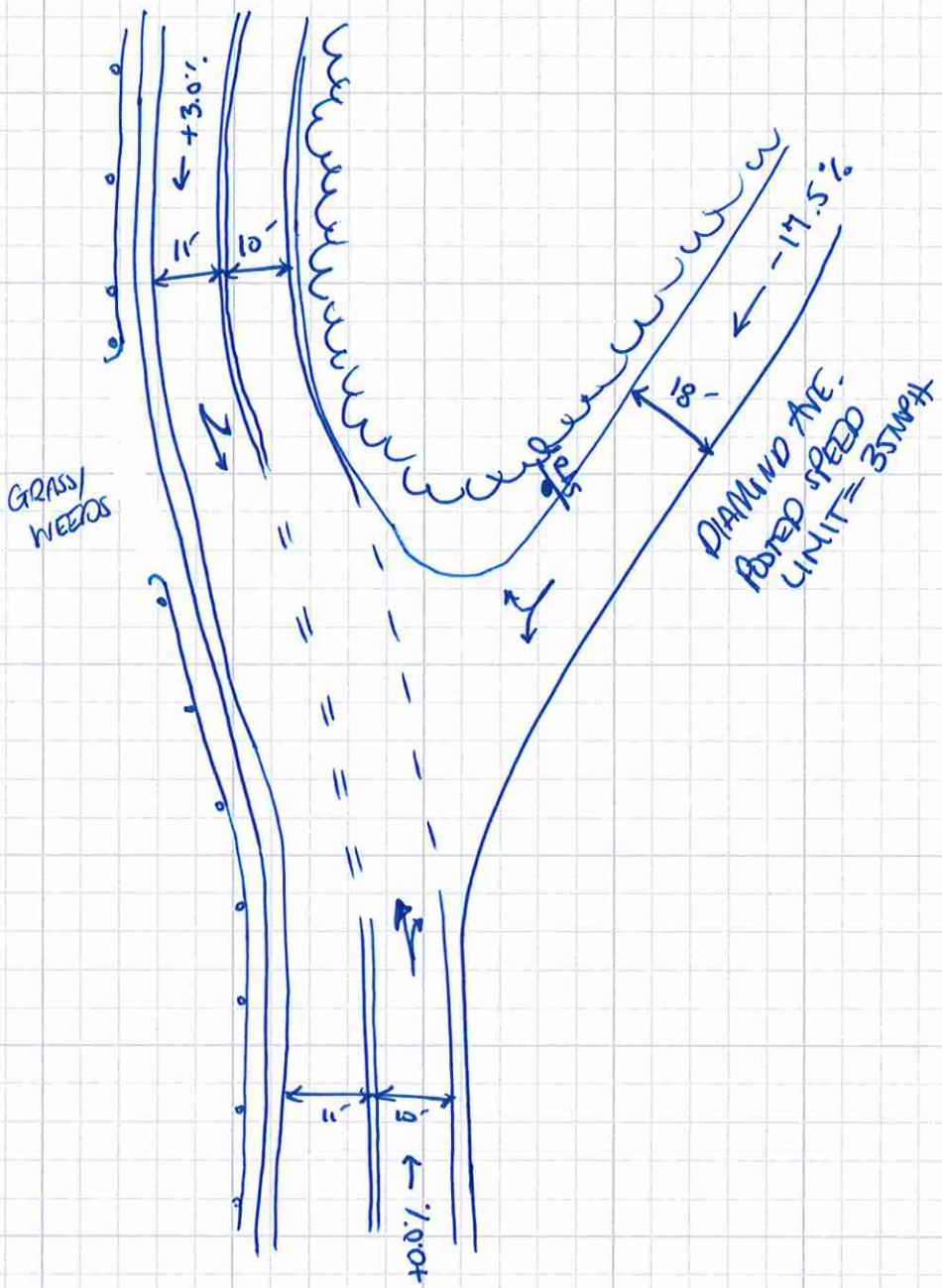
STAHL SHEAFFER ENGINEERING

Project: _____

Subject: _____

Page: _____ of _____ Date: _____

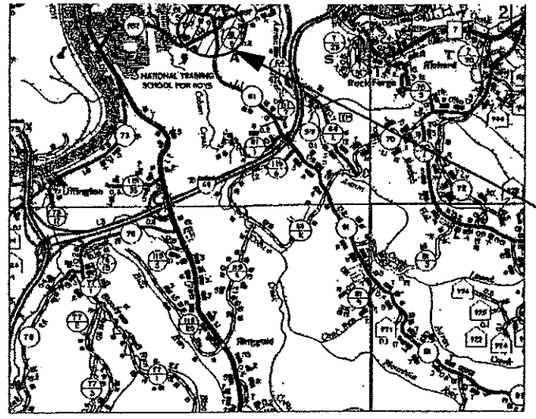
By: _____ Chk'd: _____



4N

GREENBAG RD
&
DIAMOND AVE.

FIELD NOTES 18-141



UTILITIES ENCOUNTERED

NONE

PLANS FOR CONSTRUCTION

OF

STATE HIGHWAY

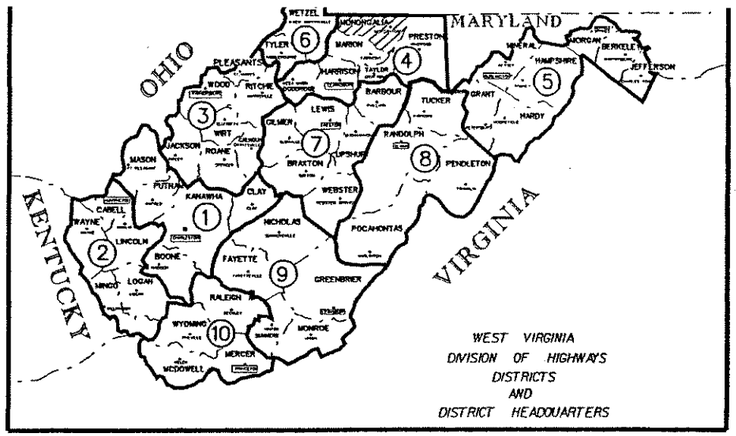
FEDERAL PROJECT NO. STPG-0857(012)E

STATE PROJECT NO. U331-857-1.41

ROUTE NO. CO.RTE 81 & CO.RTE.857

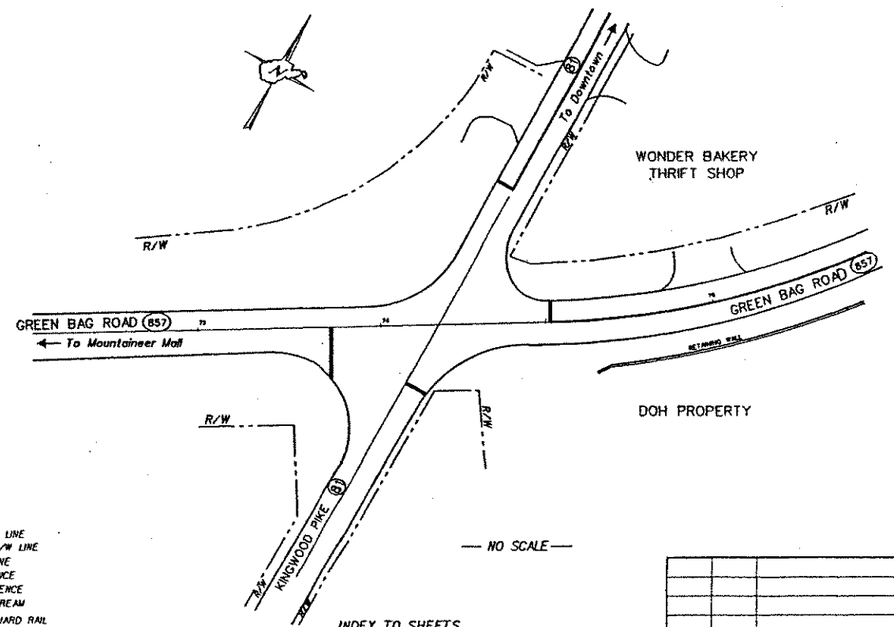
MONONGALIA COUNTY

KINGWOOD PIKE at CO. RTE. 857
TRAFFIC SIGNAL
(Morgantown)



TYPE OF CONSTRUCTION

TRAFFIC SIGNAL



— NO SCALE —

NOTES: STANDARD DETAIL BOOK DATED JANUARY 1, 2000 & VOLUME II DATED JANUARY 1, 1994, SHALL APPLY TO THIS PROJECT.

DESIGN DESIGNATION

A .D .T .(1996) = 12,500

A .D .T .(20__) = _____

D .H .V _____

D _____

T _____

V _____

CONVENTIONAL SIGNS

- STATE LINE
- COUNTY LINE
- CORPORATION LINE
- PROPOSED R/W LINE
- PROPERTY LINE
- EXISTING FENCE
- PROPOSED FENCE
- EDGE OF STREAM
- PROPOSED GUARD RAIL
- EXISTING GUARD RAIL
- RAILROAD
- GAS LINE
- WATER LINE
- TELEPHONE LINE
- ELECTRIC LINE
- TELEPHONE POLE
- POWER POLE
- COMBINED POWER AND TELEPHONE POLE
- TREE
- SHRUB
- RIGHT OF WAY MARKER

INDEX TO SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	SUMMARY OF QUANTITIES
3	NOTE SHEET
4	DETAIL SHEET
5	TRAFFIC CONTROL PLAN SHEET
6	PCS DETAIL SHEET
7	SIGNAL LAYOUT

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

December 13, 20 05

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT STPG-0857(012)E — U331-857-1.41

Edward J. Nicholson
EXECUTIVE SECRETARY

RECOMMENDED Barry Wanless
DIRECTOR TRAFFIC ENGINEERING DIVISION.

RECOMMENDED FOR APPROVAL Mark A. Murphy
STATE HIGHWAY ENGINEER

APPROVED Paul A. Mattox, Jr.
COMMISSIONER OF HIGHWAYS

PROJECT NO. STPG-0857(012)E — U331-857-1.41

3/16/2006 PRINTED BY WVDOT PRINTSHOP, OFFICE SERVICES DIVISION

C:\Data\Default\ofinaljob\D4FINAL\kngwdpike\trf_sgl_kwdpkti.dgn jstewart 12-DEC-2005 14:06 TRAFFIC ENGINEERING DIVISION

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	4	U331-857-1.41	STPG-0857(012)E	2006	MONONGALIA	2	7

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY		
		ALT.	UNIT	TOTAL
204001-000	MOBILIZATION		LS	1
636011-001	TRAFFIC CONTROL DEVICE		UNIT	4,580
636014-001	FLAGGER		HOUR	120
660001-001	SIGNAL CONTROLLER 01		LS	1
660002-020	TRAFFIC DETECTORS, VTDS, 01		LS	1
660003-006	SIGNAL SECTION, V-12		EACH	27
660004-041	SIGNAL SUPPORT, INSTALLATION ONLY, C1		EACH	3
660007-001	MISCELLANEOUS SIGNAL 01		LS	1
660010-001	PRIORITY CONTROL SYSTEM DETECTOR, D4		EACH	1
660010-010	PRIORITY CONTROL SYSTEM EMITTER		EACH	2
662007-001	LUMINAIRE (250W)		EACH	2
662014-001	INCIDENTAL ELECTRICAL WORK		LS	1
663005-010	STOP LINE, TYPE V (24")		LF	60

SPECIAL SIGNAL CONTROLLER REQUIREMENTS:

IN ADDITION TO REQUIREMENTS IN THE STANDARD SPECIFICATION, THE CONTROLLER UNIT MUST FEATURE A "MENU DRIVEN FORMAT" AND FULLY WIRED "D" CONNECTORS. ALL CONTROLLERS SHALL BE SYSTEM READY COMPLETE WITH MODEM.

THE TRAFFIC SIGNAL CONTROLLERS/ CABINETS AND SYSTEM COMPONENTS SHALL CONFORM TO THE WVDOH "APPROVED PRODUCTS LIST" (APL) AS PER MANUFACTURER.

1. THIS TRAFFIC SIGNAL SHALL BE PLACED ON FLASH FOR SEVEN (7) CALENDAR DAYS PRIOR TO FULL ACTIVATION.

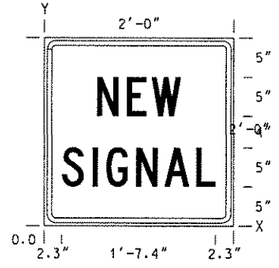
VIDEO TRAFFIC DETECTION SYSTEM (VTDS)

A VIDEO TRAFFIC DETECTION SYSTEM (VTDS) IS TO BE INSTALLED FOR THIS INTERSECTION AS DESCRIBED IN THESE PLANS. THIS VIDEO WORK & MATERIAL SHALL BE BID PER INTERSECTION [660002-020, TRAFFIC DETECTORS VTDS, (*)]

THIS INTERSECTION SYSTEM INCLUDES ALL NECESSARY CAMERAS, PROCESSING UNITS, CABLE AND RELATED HARDWARE TO MAKE FUNCTION PROPERLY. SEE VIDEO SPECIFICATIONS IN PROPOSAL AND DETAIL 'G' ON SHEET 4.

SIGN DETAIL

(NEED 4)



A W3-3 SIGN (SIGNAL AHEAD - 48"x48") WITH "NEW SIGNAL" PLAQUE w/TYPE 'B' LIGHTS(2) & FLAGS(2)-(See Sign Detail) SHALL BE INSTALLED IN ADVANCE OF THIS INTERSECTION ON GREEN BAG RD. (CR 857) AND ON KINGWOOD PIKE IN BOTH DIRECTIONS AT APPROX. 500'. THE LOCATIONS (4) TO BE APPROVED BY THE PROJECT ENGINEER. THESE SIGNS TO BE INSTALLED PRIOR TO TURNING ON NEW SIGNALS AND TO REMAIN IN PLACE FOR THIRTY (30) DAYS AFTER TURNED ON, THEN REMOVED. THIS WORK TO BE BID INCIDENTAL TO ITEM 636011-001.

SIGN NUMBER	DB
WIDTH x HEIGHT	24" x 24"
BORDER WIDTH	.62" MARGIN-.38"
CORNER RADIUS	1.12"
MOUNTING	GROUND
BACKGROUND	TYPE: REFLECTIVE
	COLOR: FLOUR. YELLOW
LEGEND/BORDER	TYPE: NON-REF
	COLOR: BLACK

DIMENSIONS IN INCHES

Y FONT	LETTER SPACINGS									HT LEN
14.0	X	N	E	W	X					5.0
C	6.7	3.8	3.1	3.7	6.7					10.6
5.0	X	S	I	G	N	A	L	X		5.0
C	2.3	3.8	1.7	3.8	3.6	4.0	2.5	2.3		19.4

SPACINGS ARE TO START OF NEXT LETTER

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SUMMARY OF QUANTITIES
KINGWOOD PIKE at CO. RTE. 857
MORGANTOWN, MONONGALIA CO.

TRAFFIC ENGINEERING DIVISION

C:\Data\Default\afinaljob\D4FINAL\kngwdpike\trf_sgl_kwdpksm.dgn jstewart 20-DEC-2005 09:56

PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	4	U331 -857- 1.41	STPG-0857 (012)E	2006	MONONGALIA	3	7

GOVERNING SPECIFICATIONS

1. THE WEST VIRGINIA DIVISION OF HIGHWAYS SPECIFICATIONS FOR ROADS AND BRIDGES ADOPTED 2000, THE WVDOH SUPPLEMENTAL SPECIFICATIONS DATED JANUARY 1, 2003, THE CONTRACT DOCUMENTS AND THE CONTRACT PLANS ARE THE GOVERNING PROVISIONS APPLICABLE TO THIS PROJECT.

1A. THE NATIONAL ELECTRICAL CODE, STANDARDS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS FOR ELECTRICAL WIRING AND APPARATUS.

SIGNAL SYSTEMS

2. "INSTALLATION OF THIS SIGNAL SYSTEM SHALL ONLY BE CONSIDERED SUBSTANTIALLY COMPLETE WHEN ALL PRESCRIBED SIGNAL SYSTEMS FUNCTIONS AND ROADWAY DETECTION SYSTEMS ARE OPERATIONAL".

GENERAL NOTES

3. REPLACEMENT OF ALL CONCRETE AND ASPHALT SHALL BE DONE IN ACCORDANCE TO ORIGINAL DESIGN THICKNESS WHERE IT HAS BEEN DISTURBED OR REMOVED TO INSTALL POLES OR CONDUIT AT THE CONTRACTOR'S EXPENSE.

4. ALL AREAS ON THIS PROJECT WHICH HAVE BEEN SEEDED BY OTHERS AND WHICH ARE DISTURBED BY THE CONTRACTOR IN PERFORMING THE REQUIREMENTS OF THIS CONTRACT SHALL BE REPLACED TO THEIR ORGINAL CONDITION BY APPROVED SEEDING AND MULCHING METHODS AND MATERIALS AS DIRECTED BY THE ENGINEER. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THIS WORK.

5. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. ANY DAMAGE INCURRED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL COORDINATE HIS ACTIVITIES WITH THE FOLLOWING AGENCIES IN THE MORGANTOWN AREA:

CITY OF MORGANTOWN	MS. TERRY HOUGH MR. JIM WINAUGHT	284-7412
ALLEGHENY POWER	BUD STONE	284-1260/ 692-4066 (1-800-255-3443)
VERIZON	FRED FRASIER	623-6828
DOMINION-HOPE GAS	LYNN MALONE	581-5849/ 288-2235
MORGANTOWN UTILITY	DOUGLAS SMITH	292-8443

7. COLOR CODING OF ELECTRICAL CONDUCTORS BY USE OF PHASE TAPE OR FIELD PAINT IS NOT ACCEPTABLE ON THIS PROJECT. CONDUCTORS MUST BE MANUFACTURER-COLORED, STRIPED OR RIGID-MARKED AS SPECIFIED.

8. ALL NEW METALLIC SIGNAL EQUIPMENT SUCH AS POLES CONDUIT AND CABINETS MUST BE DIRECTLY BONDED TOGETHER BY A SPECIAL RUN SINGLE-CONDUCTOR • 8 AWG STRANDED COPPER WIRE. THE WIRE MUST BE INSULATED, COLOR CODED GREEN AND CONNECTED AT EACH BONDING POINT BY USE OF SCREW-TYPE COPPER OR BRONZE LUGS. IN ADDITION TO THIS BONDING, CONDUCTOR MUST BE CONNECTED TO ALL GROUND RODS IN THE SIGNAL SYSTEM AND TO THE EQUIPMENT GROUND BAR BUSS IN THE CONTROLLER CABINET.

9. TRAFFIC SIGNAL GROUND ROD CONNECTORS MUST BE ATTACHED AND SECURELY FASTENED BOTH AT FOUNDATION AND INSIDE POLE PRIOR TO ERECTION OF POLE. ENOUGH SLACK IN THE GROUNDING WIRE MUST BE ALLOWED FOR ERECTION OF POLE. BOTH CONNECTIONS MUST AGAIN BE CHECKED AFTER POLE IS INSTALLED.

10. AC - (COMMON), LOGIC GROUND AND CHASSIS GROUND MUST BE ISOLATED IN THE CONTROLLER AND DETECTOR CIRCUITRY AS REQUIRED IN THE NEMA STANDARDS.

11. ALL NEW POLE BASES SHALL BE PROVIDED WITH VARMINT SCREENS. CONTRACTOR SHALL ALSO INSTALL NEW VARMINT SCREENS ON FOR ANY EXISTING POLES WHOSE GROUT IS MISSING OR IF DAMAGED, GROUT TO BE REMOVED AND VARMINT SCREEN INSTALLED. BID AS PART OF ITEM 660007-001(*) PER INTERSECTION

12. THREADED COUPLINGS TO BE USED TO CONNECT METAL CONDUITS. SET SCREW COUPLINGS, SLIP JOINTS AND CONTINUOUS RUNNING THREADS ARE NOT ACCEPTABLE.

13. UTILITY NOTE

THE CONTRACTOR MUST NOTIFY ALL APPLICABLE UTILITIES PRIOR TO ANY EXCAVATION FOR EXACT LOCATION OF THEIR UNDERGROUND FACILITIES. EXTREME CAUTION SHALL BE USED IN THESE AREAS ESPECIALLY IN EXCAVATING FOR FOUNDATIONS AND THE JACKING OF CONDUIT. IF NECESSARY THE CONTRACTOR SHALL HAND DIG TO LOCATE LINES OR SHALL OPEN CUT IN AREAS OF POSSIBLE CONFLICT. THESE AREAS TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE PROJECT ENGINEER. CONTACT 'MISS UTILITY' PRIOR TO ANY EXCAVATING.

TRAFFIC CONTROLLERS/DETECTORS

SIGNAL POWER SERVICE

1. CONTRACTOR SHALL INSTALL A NEW POWER SERVICE (METER, MAIN DISCONNECT) ON SIGNAL POLE P1 AND THEN INSTALL NEW POWER SERVICE CABLE TO CONTROLLER AS SHOWN IN THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR ALL FEES ASSESSED BY THE POWER CO.,CONTRACTOR SHALL CONTACT ALLEGHENY POWER AT LEAST 3 WEEKS PRIOR TO NEED FOR "APPLICATION FOR SERVICE " (1-800-255-3443). WORK REQUEST NO. 1001287

2. THE NEW CONTROLLER MUST PROVIDE A TRUE MENU FORMAT FOR DATA ENTRY AND OPERATIONAL MONITORING. ALL CONTROLLER PARAMETERS INCLUDING OVERLAPS MUST BE KEYBOARD PROGRAMMABLE. AS A MINIMUM, A LIGHTED FORTY (40) COLUMN BY FOUR (4) LINE LIQUID CRYSTAL DATA DISPLAY SCREEN MUST BE PROVIDED ON THE FRONT OF THE CONTROLLER. THE DISPLAY MUST BE EASILY VISIBLE IN BOTH FULL DAYLIGHT AND AT NIGHT. BACK LIGHTING THE DISPLAY IS REQUIRED.

3. ALL NEW CONDULETS FROM POLE TO CONTROLLER SHALL BE 3". NEW POLE MTD. CONTROLLER CABINETS SHALL BE MOUNTED AT 3' ABOVE GROUND UNLESS OTHERWISE STATED ON PLAN SHEET.

4. VIDEO IMAGE PROCESSING UNIT RACKS

VIDEO IMAGE PROCESSING UNIT RACKS TO BE CARD-RACK TYPE AND INSTALLED WITHIN THE CONTROLLER CABINET. THE VIDEO IMAGING RACKS MUST HAVE A MINIMUM OF EIGHT (8) POSITIONS AND BE WIRED FOR 2 CHANNEL VIDEO DETECTION CARD, WITH POSITIONS 7 AND 8 WIRED FOR PRIORITY VEHICLE PRE-EMPT CONTROL SYSTEMS. RACK MOUNTED POWER SUPPLY MUST ALSO BE FURNISHED WITH THESE UNITS AS WELL AS ALL ISOLATION COMPONENTS AS RECOMMENDED OR FURNISHED AS A STANDARD BY THE EQUIPMENT MANUFACTURER. BID RACKS AS PART OF ITEM 660001-001(*). * PER INTERSECTION.

5. THE CONTRACTOR SHALL SUPPLY TWO (2) VIDEO CAMERAS, 200 L.F. OF VIDEO CABLE AND ONE (1) TWO-CHANNEL PROCESSING UNIT TO THE WVDOH (SIGNAL/LIGHTING MAINTENANCE SHOP ON DRY BRANCH ROAD 304-558-5126). THESE TO BE BID AS PART OF ITEM 660002-020 VTDS, (01). TO BE USED AS REPLACEMENT PARTS AS NECESSARY.

6. ALSO, THE CONTRACTOR SHALL SUPPLY THE WVDOH WITH 4 PRE-EMPTION PHASE SELECTION MODULES, BID THIS AS INCIDENTAL TO ITEM 660010-001. THESE ALSO TO BE DELIVERED TO WVDOH SIGNAL/LIGHTING MAINTENANCE SHOP

7. METAL OXIDE VARISTORS (MOV'S)

MOV SURGE PROTECTORS OF APPROVED DESIGN MUST BE INSTALLED AT ALL LINE TO NEUTRAL, LINE TO EQUIPMENT GROUND AND NEUTRAL TO EQUIPMENT GROUND LOCATIONS. IN ADDITION, MOV's ARE REQUIRED ON THE LOAD TERMINAL OF LOAD SWITCHES AND EACH TERMINAL OF THE OUTPUT TERMINAL STRIP. BID AS PART OF ITEM 660001-001(*). *- PER INTERSECTION

SIGNAL HEAD CONDUCTOR CABLE

8. ALL SIGNAL HEAD CONDUCTOR CABLE SHALL BE IMSA BLACK PE, 20-1, 7-CONDUCTOR, 14 AWG STRANDED COPPER CABLE RATED AT 600V. THIS CONDUCTOR CABLE SHALL BE RED, ORANGE, GREEN, BLACK, WHITE, AND TWO (2) DIFFERING COLORS. IN ACCORDANCE WITH IMSA SPEC COLOR CODE.

POLES

1. POLE LOCATIONS ON THE PLAN SHEETS MAY BE ALTERED ONLY WITH THE APPROVAL OF THE WEST VIRGINIA DIVISION OF HIGHWAYS, TRAFFIC ENGINEERING DIVISION.

2. ALL NEW POLE LOCATION DIMENSIONS ARE TO THE CENTER OF POLE FOUNDATION.

3. ALL NEW POLE COUPLINGS (WIRE SERVICE ENTRIES) SHALL BE 3".

4. FOUNDATION SIZES FOR NEW POLES SHALL BE IN ACCORDANCE WITH WEST VIRGINIA DIVISION OF HIGHWAYS STANDARD TES-40.

5. ALL NEW SIGNAL POLES (3) AND THEIR ANCHOR BOLTS (12) ARE TO BE SUPPLIED BY THE DIVISION OF HIGHWAYS. TYPE C1 POLES (3) AND THEIR ANCHOR BOLTS ARE TO BE PICKED UP BY THE CONTRACTOR AT THE WVDOH CENTRAL SIGNAL SUPPLY YARD NEAR THE D1 SIGN SHOP IN NITRO.
THE DIVISION HIGHWAYS SHALL ALSO SUPPLY ANCHOR BOLTS, NUTS, PLATES, AND ANCHOR BOLT COVERS. THESE ARE TO BE PICKED UP BY THE CONTRACTOR AT THE CENTRAL SIGNAL SHOP ON DRY BRANCH ROAD, NEAR CHARLESTON. THE CONTRACTOR IS TO SUPPLY EQUIPMENT TO LOAD POLES IN A MANNER AS TO NOT DAMAGE THEM. AT LEAST FIVE (5) DAYS NOTICE SHALL BE GIVEN PRIOR TO PICK-UP (PHONE 558-3063-- OR TED WHITMORE) THE METAL NO. TAGS MUST BE GIVEN TO THE WVDOH PERSONAL PRIOR TO POLES LEAVING THE NITRO LOT. APPROVED WVDOH PERSONNEL MUST BE ON SITE DURING PICK-UP OF POLES. THE CONTRACTOR SHALL SUPPLY SPAN WIRE CLAMPS, BRACKETS, AND OTHER HARDWARE ITEMS NECESSARY FOR COMPLETION OF THIS PROJECT. BID INSTALLATION OF THESE POLES AS ITEM 660004-041 (C1) OR 660004-051 (E1) AS APPLICABLE.

6. ALL NEW TYPE C1 POLE FOUNDATIONS (3) TO HAVE A 2"R CONDUIT STUB-OUT (CAPPED) INSTALLED.

7. ALL CONCRETE FOUNDATIONS SHALL BE SUBJECT TO SECTION 601 OF THE WVDOH STANDARD SPECIFICATIONS ADOPTED 2000. TRAFFIC SIGNAL POLE FOUNDATIONS SHALL CURE FOR A MINIMUM OF SEVEN (7) DAYS PRIOR TO INSTALLING THE POLE.

8 A 3" POLE COUPLING AND WEATHERHEAD SHALL BE INSTALLED ON POLES AT ANY WIRE SERVICE ENTRY POINT. SEE STANDARD DETAIL SHEET TES-20.

SIGNAL HEADS

1. ALL NEW SIGNAL HEADS FOR THIS PROJECT SHALL HAVE CUTAWAY VISORS, SIGNAL HEADS NO. 1 & 2 SHALL HAVE ALUMINUM BODIES, DOORS AND VISORS.ALSO, THESE (SIGNAL HEAD NOS. 1 & 2) SHALL HAVE BLACK, LOUVERED ALUMINUM BACKPLATES. ALL OTHER SIGNAL HEADS IN THIS PROJECT SHALL BE NON-METALLIC.

ALL BACKPLATES SHALL BE LOUVERED, BLACK AND SHALL HAVE A RETROREFLECTIVE 1" BORDER WITH A 1" MARGIN. THIS BORDER SHALL COMPRISE OF TYPE IX , FLOURESCENT YELLOW, PRESSURE SENSITIVE RETROREFECTIVE SHEETING AND PLACED ON PERIMETER FACE OF ALL BACKPLATES.

2a. ALL NEW VEHICULAR SIGNAL SECTIONS SHALL UTILIZE LIGHT EMITTING DIODE (L.E.D.) SIGNAL MODULES AT 120 VAC. ALL UNITS SHALL NOT UTILIZE MORE THAN 22 WATTS POWER CONSUMPTION.

b. THESE L.E.D. MODULES SHALL BE CAPABLE OF RETROFITTING CURRENT NEMA TS-1 SIGNAL HEADS HOUSINGS.

c. ALL L.E.D. TRAFFIC SIGNAL MODULES SHALL BE BID INCIDENTAL TO ITEM 660003-006(V-12).

d. ALL TRAFFIC SIGNAL MODULES SHALL CONFORM TO THE WVDOH SPECIFICATION (SEE PROPOSAL) CONCERNING L.E.D. SIGNAL MODULES.

e. SEE THE WVDOH "APPROVED PRODUCTS LIST" (APL) FOR APPROVED LED MANUFACTURERS.

3. ALL LED'S SHALL CONFORM TO THE ITE VTCSH LED TRAFFIC SIGNAL LAMP, AS WELL AS THE ITE VTCSH PART 2: LED VEHICLE SIGNAL MODULES (INTERIM) SPECIFICATIONS.

4. VERTICAL CLEARANCE OF 17' (+ OR - 3") TO BE MAINTAINED TO THE BOTTOM OF ALL NEW SIGNAL HEADS.

LUMINAIRE WORK ON SIGNAL POLES

1. NEW LUMINAIRES (2) TO BE SUPPLIED BY CONTRACTOR AND INSTALLED ON SIGNAL POLES P1 & P3 AS SHOWN IN PLANS. THIS LUMINAIRE SHALL HAVE AN INTEGRAL PHOTO-CELL. THE 240-VOLT LUMINAIRE CIRCUIT SHALL BE PROTECTED BY A SEPARATE BREAKER PROVIDED IN THE SIGNAL POWER SERVICE ENCLOSURE. LUMINAIRE WIRING SHALL BE SUNLIGHT-RESISTANT, THREE CONDUCTOR #12 IMSA CABLE AND SHALL RUN CONTINUOUSLY WITH NO SPLICING OR IN-LINE FUSING. LUMINAIRE WIRING SHALL BE TAGGED AT ALL ACCESS POINTS.

2. LUMINAIRE SHALL BE BID AS ITEM 662007-001(250). ALL ROADWAY LUMINAIRE WORK AND MATERIAL SHALL BE BID AS ITEM 662014-001.

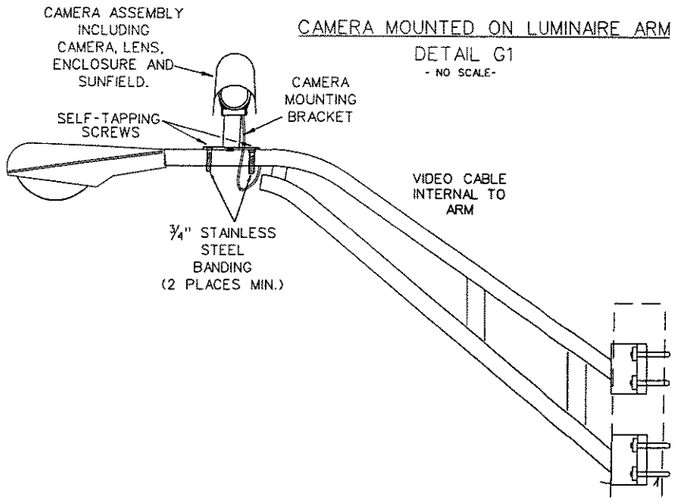
3. LUMINAIRE ARMS (2) TO BE SUPPLIED BY CONTRACTOR AND SHALL BE THE TRUSS/CLAMP-ON TYPE BID AS PART OF ITEM 660007-001(01).

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SIGNAL GENERAL NOTE
KINGWOOD PIKE AT CO. RTE. 857
MORGANTOWN, MONONGALIA CO.

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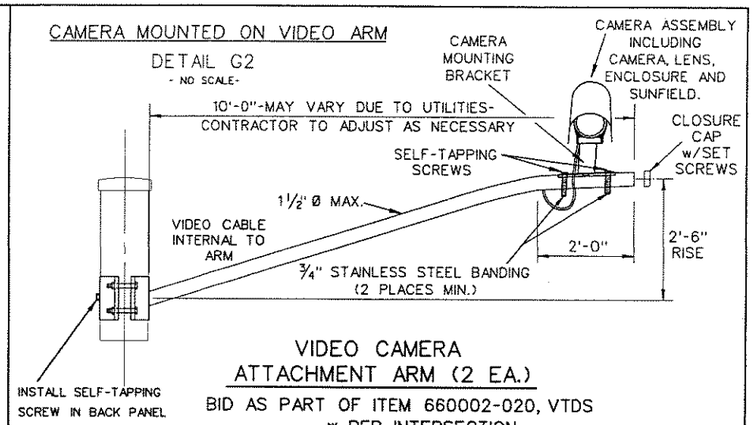
PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	4	U331 -857- 1.41	STPG-0857 (012)E	2006	MONONGALIA	4	7



CAMERA MOUNTED ON LUMINAIRE ARM

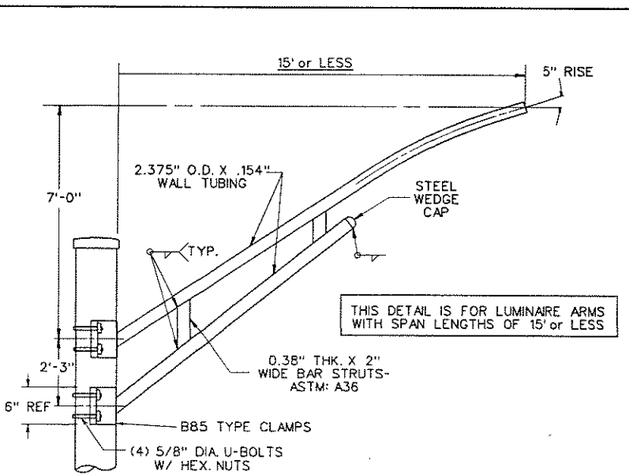
DETAIL G1

- NO SCALE-



DETAIL 'G'

VIDEO CAMERA MOUNTING DETAILs

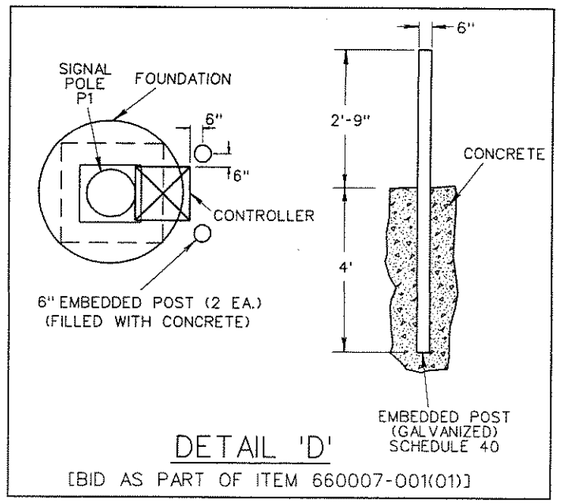


DETAIL "C"

LUMINAIRE ARMS (2 EA.)

SUPPLIED BY CONTRACTOR

2-1/S*1 ITEM 660007-001(01)



DETAIL 'D'

[BID AS PART OF ITEM 660007-001(01)]

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SIGNAL DETAIL SHEET

KINGWOOD PIKE at CO. RTE. 857

MORGANTOWN, MONONGALIA CO

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
WV	4	U331 857 1.41	STPG-0857 (012)E	2006	MONONGALIA	5	7

MAINTENANCE OF TRAFFIC SUMMARY

ITEM NO.	DESCRIPTION	QUANTITY	
		UNIT	TOTAL
636002-001	AGGREGATE FOR MAINTAINING TRAFFIC, STONE OR GRAVEL	TON	
636002-002	AGGREGATE FOR MAINTAINING TRAFFIC, SLAG	TON	
636003-001	BITUMINOUS MATERIAL FOR DUST PALLIATIVE	GAL.	
636004-001	CALCIUM CHLORIDE FOR DUST PALLIATIVE	TON	
636005-001	TEMPORARY STRUCTURES FOR MAINTAINING TRAFFIC	L.S.	
636005-001	PILOT TRUCK AND DRIVER	DAY	
636007-001	ERADICATION OF PAVEMENT MARKINGS	L.F.	
636008-001	TEMPORARY PAVEMENT MARKING - PAINT	L.F.	
636009-001	TEMPORARY PAVEMENT MARKING - TAPE TYPE VIII B	L.F.	
636010-003	TEMPORARY RAISED PAVEMENT MARKERS - TYPE	EACH	
636011-001	TRAFFIC CONTROL DEVICES	UNIT	4,580
636012-010	CLEANING OF PROJECT TRAFFIC CONTROL DEVICES	EACH	
636013-001	CLEANING OF INDIVIDUAL TRAFFIC CONTROL DEVICES	EACH	
636014-001	FLAGGER	HOUR	120
636015-001	TEMPORARY GUARDRAIL CHANNELIZATION DEVICE	L.F.	
636016-001	REMOVE AND RESET TEMP. GUARDRAIL CHANNELIZATION DEVICE	L.F.	
636017-001	TEMPORARY CONCRETE BARRIER	L.F.	
636017-002	DOH FURNISHED TEMPORARY CONCRETE BARRIER	L.F.	
636018-001	REMOVE AND RESET TEMPORARY CONCRETE BARRIER	L.F.	
636018-002	REMOVE AND RESET DOH FURNISHED TEMP. CONCRETE BARRIER	L.F.	
636019-001	TEMPORARY GUARDRAIL BARRIER	L.F.	
636020-001	REMOVE AND RESET TEMPORARY GUARDRAIL BARRIER	L.F.	
636021-001	ELECTRIC ARROW	DAY	
636022-001	CHANGEABLE MESSAGE SIGN	DAY	
636023-001	TEMPORARY TRAFFIC SIGNAL	L.S.	
636024-001	TEMPORARY PIPE FOR MAINTAINING TRAFFIC	L.F.	
636025-001	WARNING LIGHTS, TYPE A	DAY	
636025-001	WARNING LIGHTS, TYPE B	DAY	
636025-001	WARNING LIGHTS, TYPE C	DAY	
636026-001	TEMPORARY LIGHTING	L.S.	
636028-001	SHADOW VEHICLE	DAY	

TRAFFIC CONTROL DEVICES QUANTITIES

DEVICE	DESCRIPTION	VALUES IN UNITS	QUANTITIES	TOTAL UNITS
* 1	SIGNS ON PORTABLE MOUNTS AND BARRICADES (TOTAL SIGN AREA 16 SQ. FT. OR GREATER)	170	14	2,380
* 2	SIGNS ON PORTABLE MOUNTS AND BARRICADES (TOTAL SIGN AREA LESS THAN 16 SQ. FT.)	80	4	320
* 3	SIGNS ON PERMANENT POSTS (TOTAL SIGN AREA 16 SQ. FT. OR GREATER)	180	3	540
* 4	SIGNS ON PERMANENT POSTS (TOTAL SIGN AREA LESS THAN 16 SQ. FT.)	90		
5	BARRICADES - TYPE I	35		
6	BARRICADES - TYPE II	60	4	240
7	BARRICADES - TYPE III	90		
* * 8	DRUMS	60	15	900
9	CONES	5	40	200
10	VERTICAL PANELS OR GROUND MOUNTED DELINEATORS	10		
11	BARRIER OR GUARDRAIL MOUNTED DELINEATORS (TO BE BID INCIDENTAL TO THE COST OF THE BARRIER OR GUARDRAIL)	0		
12	TEMPORARY OVERLAYS AND TEMPORARY OVERSIZE SIGNS			
		TOTAL		4,580

* - ORANGE SIGN SHEETING TO BE REFLECTIVE FLOURESCENT ORANGE - TYPE V

* * - BARRICADE AND DRUM SHEETING TO BE 6" FLEXIBLE HIGH INTENSITY, TYPE IV

MAINTENANCE OF TRAFFIC NOTES

1. MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH SECTION 636 OF THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS ROADS AND BRIDGES, ADOPTED 2000, AND THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, DIVISIONS OF HIGHWAYS SUPPLEMENTAL SPECIFICATIONS DATED JANUARY 1, 2003 AND THE MANUAL, "TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE MAINTENANCE OPERATIONS", NOV. 1994; WHICH IS MADE A PART OF THIS CONTRACT AND THE TRAFFIC PLAN FOR FOR INDIVIDUAL SEGMENTS AS DESCRIBED IN THESE PLANS.
2. REFLECTIVE SHEETING ON TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE OF NEW CONDITION AT THE BEGINNING OF THE PROJECT LIFE. NIGHT VISIBILITY AND LEGIBILITY SHALL BE MAINTAINED. ALL WARNING SIGNS SHALL HAVE MINIMUM DIMENSIONS OF 48" X 48" UNLESS OTHERWISE NOTED. SIGN SIZES AND COLORS ARE SHOWN IN THE WEST VIRGINIA DIVISION OF HIGHWAYS SIGN FABRICATION MANUAL.
3. ACCESS TO ALL HOUSES AND BUSINESSES SHALL BE MAINTAINED AT ALL TIMES.
4. TRAFFIC SHALL BE MAINTAINED THROUGHOUT THE PROJECT AT ALL TIMES. ALSO, THE CONTRACTOR IS TO COORDINATE WITH THE CITY OF MORGANTOWN TO MINIMIZE EFFECTS OF TRAFFIC FLOW.
5. OPEN HOLES TO BE COVERED AND HAVE TYPE II BARRICADES w/TYPE 'A' LIGHTS. THERE IS NO SPECIFIC BID ITEM FOR TYPE 'A' LIGHTS SHALL BE BID INCIDENTAL TO ITEM 636011-001.
6. ALL SIGNS INDICATING "ROAD CONSTRUCTION" SHALL NOW READ "ROAD WORK". FOR EXAMPLE, THE W-20-1 "ROAD CONSTRUCTION NEXT MILES", SHALL READ "ROAD WORK NEXT MILES", AND G20-2 "END CONSTRUCTION" SHALL READ "END ROAD WORK".
7. ALL WORK THROUGH OUT THE LIFE OF THIS PROJECT SHALL BE CO-ORDINATED WITH THE CITY OF MORGANTOWN TO MINIMIZE EFFECTS ON TRAFFIC FLOW, ESPECIALLY FOR ANY 'SPECIAL EVENTS'. CONTRACTOR SHALL NOTE THESE 'SPECIAL EVENTS' IN ADVANCE TO MINIMIZE DISRUPTIONS.
8. THERE SHALL NO LANE CLOSURES ON WVU HOME FOOTBALL OR BASKETBALL GAME DAYS.

SEQUENCE OF CONSTRUCTION

1. UNDERGROUND WORK - BASICALLY ALL CONDUIT, JUNCTION BOXES, POLE FOUNDATIONS, ETC.

   NON-ROAD - USE CASE A3 OR A4 WITHOUT TYPE 'B' LIGHTS FOR ONE, TWO, THREE, OR FOUR APPROACHES AS NECESSARY.

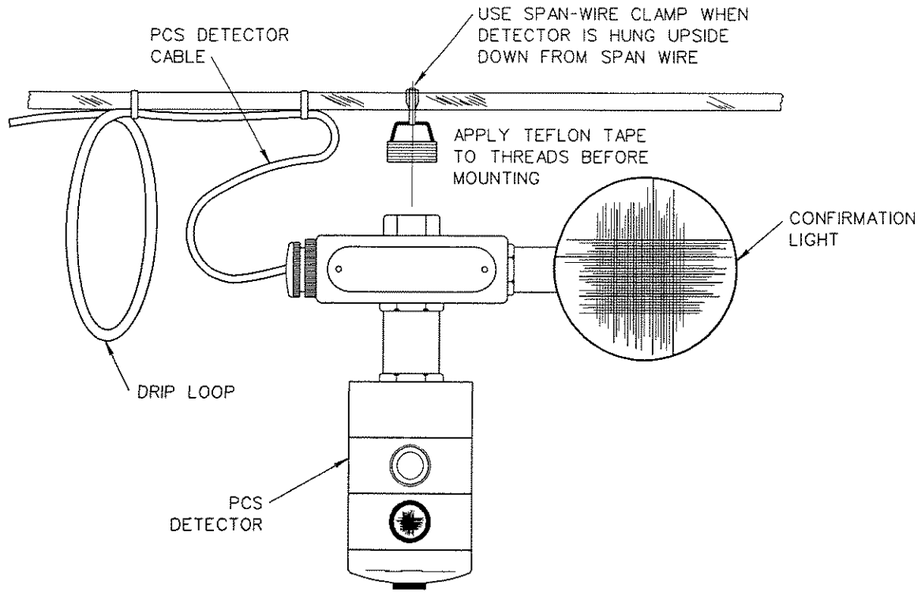
   IN ROADWAY - USE CASES B1 OR B4A AS APPROPRIATE. DO NOT CLOSE LANES OVERNIGHT.

   NOTE: FOR PEDESTRIANS, INSTALL " WORKERS" (W21-1a) SIGNS, TYPE II BARRICADES OR DRUMS, CONSTRUCTION TAPE, AND TYPE 'A' LIGHT OR TYPE II BARRICADE OR DRUM FOR OVERNIGHT AS NECESSARY.
2. CONSTRUCTION OF INDIVIDUAL INTERSECTION.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

TRAFFIC CONTROL PLAN, NOTES, QUANTITIES
KINGWOOD PIKE AT CO. RTE. 857
MORGANTOWN, MONONGALIA CO.

PUBLIC ROADS DIV.	STATE DIST. NO.	PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
WV	4	S331 857 1.41	STPG-0857 (012)E	2006	MONONGALIA	6	7



PCS SPAN WIRE INSTALLTION

1. WEEP HOLE(S) MUST BE REMOVED PRIOR TO INSTALLATION. CONTRACTOR IS FULLY LIABLE FOR EQUIPMENT REPLACEMENT DUE TO CORROSION.
2. A DRIP LOOP IS TO BE PROVIDED ADJACENT TO RECEIVER.
3. TEFLON TAPE IS TO BE USED ON ALL PCS RECEIVER THREADED CONNECTIONS.

PRIORITY CONTROL SYSTEM (PCS)
BID AS ITEM 660010-001( ) - SEE BELOW

THE PRIORITY CONTROL SYSTEM SHALL PROVIDE ADVANCE SIGNAL CONTROL PER INTERSECTION APPROACH AS SHOWN ON THE PLAN SHEETS. THE SYSTEM CONSISTS OF EMITTERS, (2 EA.), DETECTORS w/CONFIRMATION LIGHT, (4 EA.), CARD RACK MOUNTED SIGNAL INTERFACE UNITS, (1 EA.), AND NECESSARY WIRING. THIS ALSO INCLUDES MOUNTING HARDWARE AND OTHER HARDWARE ITEMS TO COMPLETE SYSTEM.

ONE (1) EMITTER IS TO BE INSTALLED ON A CITY OF MORGANTOWN'S VEHICLE AND ONE (1) EMITTER IS TO BE GIVEN TO THE WVDOH TRAFFIC ENGINEERING DIVISION (MR BRUCE KENNEY- 558-3063)

THE EMITTER IS TO BE MOUNTED ON THE PRIORITY VEHICLE AND TRANSMITS A SHAPED, OPTICAL PATTERN OF CODED LIGHT TO A DETECTOR AT THE PRIORITIZED INTERSECTION APPROACH. CONTACT CITY OF MORGANTOWN (MR. DAVID FETTY-FIRE CHIEF-284-7481) FOR VEHICLE TO BE MOUNTED ON. THE INTERFACE UNIT WILL THEN INPUT A CALL TO THE CONTROLLER FOR A PROGRAMMED PREEMPTION ROUTINE. THE TRANSMIT/RECEIVE DISTANCE FOR EACH INTERSCTION APPROACH MUST BE USER PROGRAMMABLE AND WILL BE THE RESPONSIBILITY OF THE DIVISION OF HIGHWAYS TO BE DETERMINE AND SET. A MEANS FOR ADJUSTMENT OF THE TRANSMIT/RECEIVE DISTANCE PER APPROACH MUST BE PROVIDED WITH THE SYSTEM. PCS UNITS WILL BE PAID FOR AS ITEMS 660010-010(EM) - "PCS EMITTER", EACH AND 660010-001(*) - "PCS DETECTORS", EACH.

* D1, D2, D3, D4
CODE REPRESENTS NO. OF DETECTORS TO BE INSTALLED.
BID PER INTERSECTION

ALSO SEE INDIVIDUAL I/S SHEETS FOR I/S QUANTITIES AND SPECIFICATIONS FOR FUTHER DETAILS. EXACT LOCATION AND AIM OF PCS DETECTORS TO BE DETERMINED BY THE PROJECT ENGINEER.

THE NEW PCS DETECTORS (3) SHALL BE PLACED ON SAME FREQUENCY AS THE EXISTING CITY OF MORGANTOWN PCS DETECTOR SYSTEMS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

PCS NOTES & DETAILS
KINGWOOD PIKE AT CO. RTE. 857
MORGANTOWN, MONONGALIA CO.

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PUBLIC ROADS DIV.	STATE DIST. NO.	STATE PROJECT NO.	FEDERAL PROJECT NO.	FISCAL YEAR	COUNTY	SHEET NO.	TOTAL SHEETS
W.V.	4	U331 -857- 1.41	STPG-0857 (012)E	2006	MONONGALIA	7	7

ESTIMATE OF QUANTITIES

LIST	QUANTITY	DESCRIPTION
1	1	CONTROLLER - 660001-00101) TYPE C
2	1	SIGNAL MONITORING DEVICE
3	1	CONTROLLER & DETECTOR CABINET (UNIT) (POLE MOUNT)
4	1	POWER SERVICE
5	3 *	STEEL STRAIN POLE (TYPE C1)
6	12 *	ANCHOR BOLTS (2" X 90")
7	3	FOUNDATIONS
8	AS NEEDED	MISCELLANEOUS HARDWARE & ITEMS
9	AS NEEDED	CONDUIT & CONDUCTOR CABLE, MESSENGER CABLE
10	2	TWO-WAY 3-SECTION 12" R.Y.G.; SW
11	4	ONE-WAY 3-SECTION 12" R.Y.G.; SW
12	1	ONE-WAY 3-SECTION 12" R.Y.G.; PM
13	6	VIDEO CAMERA (2 VIDEO ARM MTD.; 2 LUM. ARM MTD., 2 -WVDOH) - 660002-020, VTDS, 01
14	AS NEEDED	VIDEO IMAGE PROCESSING UNIT
15	AS NEEDED	VIDEO CABLE AND VIDEO HARDWARE
16	2	VIDEO ARM (SEE DETAIL G2)
17	2	LUMINAIRE ARMS
18	2	LUMINAIRE - 250W; 120/208/240/277 MULTITAP (LU-250/BD/S) TYPE III MEDIUM SEMI-CUTOFF,HPS
19	2	PROTECTIVE POSTS (SCHEDULE 40-GALVANIZED-6") [BID AS PART OF ITEM 660007-001(01)]
20	4	PCS DETECTOR W/CONFIRMATION LIGHT
21	1	PCS INTERFACE (RACK MTD.)
22	2	PCS EMITTER

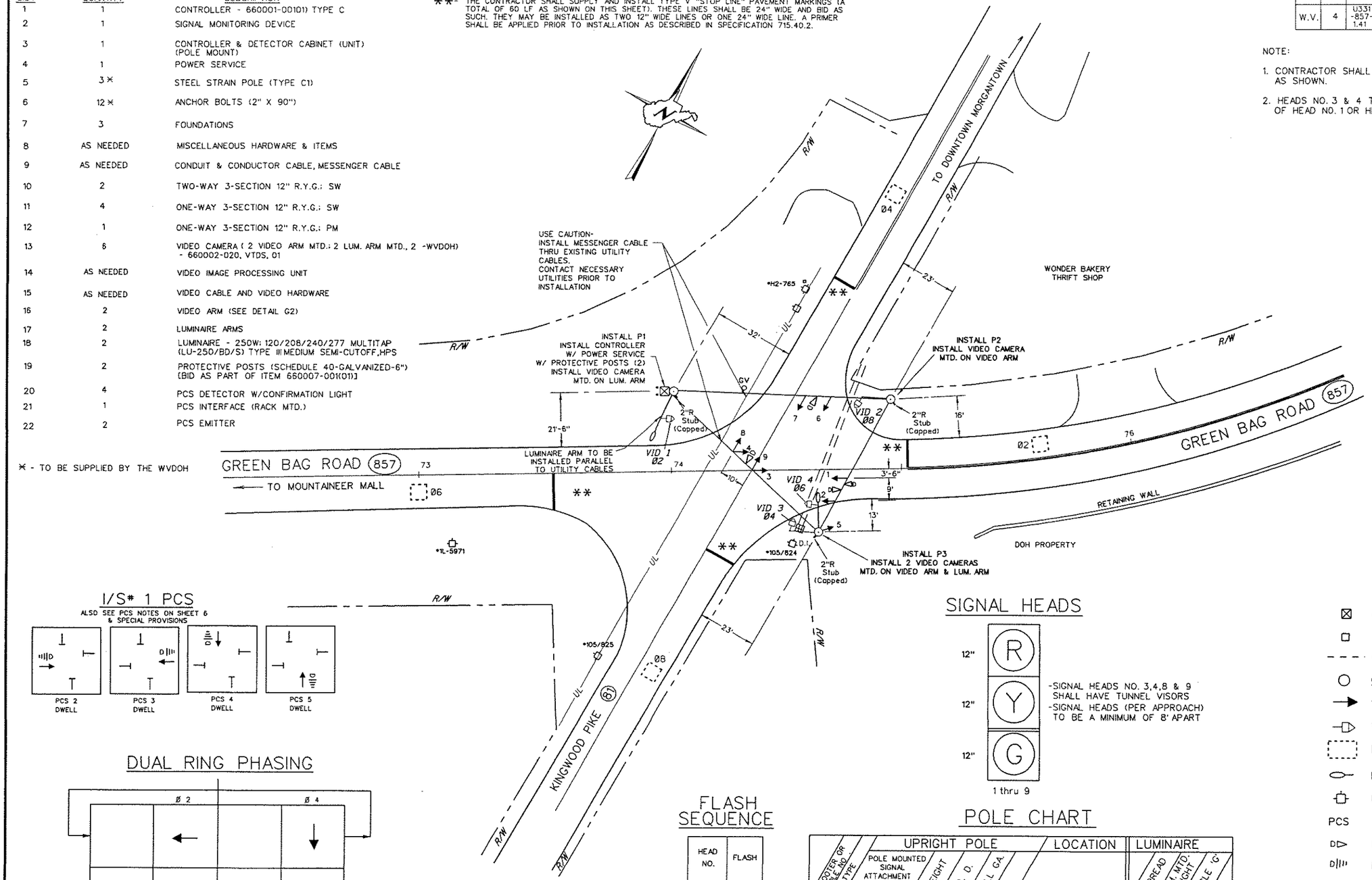
* - TO BE SUPPLIED BY THE WVDOH

STOP LINE NOTE

** - THE CONTRACTOR SHALL SUPPLY AND INSTALL TYPE V "STOP LINE" PAVEMENT MARKINGS (A TOTAL OF 60 LF AS SHOWN ON THIS SHEET). THESE LINES SHALL BE 24" WIDE AND BID AS SUCH. THEY MAY BE INSTALLED AS TWO 12" WIDE LINES OR ONE 24" WIDE LINE. A PRIMER SHALL BE APPLIED PRIOR TO INSTALLATION AS DESCRIBED IN SPECIFICATION 715.40.2.

NOTE:

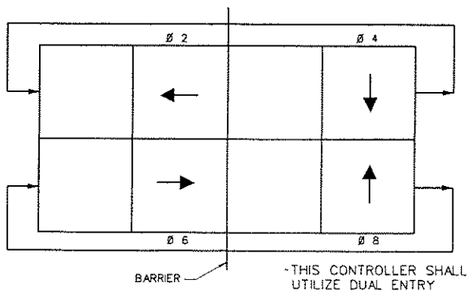
1. CONTRACTOR SHALL USE CAUTION TO INSTALL HEADS AS SHOWN.
2. HEADS NO. 3 & 4 TO BE INSTALLED TO NOT BLOCK VIEW OF HEAD NO. 1 OR HEAD NO.7.



I/S# 1 PCS

ALSO SEE PCS NOTES ON SHEET 6 & SPECIAL PROVISIONS

DUAL RING PHASING



-THIS CONTROLLER SHALL UTILIZE DUAL ENTRY

FLASH SEQUENCE

HEAD NO.	FLASH
1,2,3 4,5	Y
6,7 8,9	R

SIGNAL HEADS

1 thru 9

-SIGNAL HEADS NO. 3,4,8 & 9 SHALL HAVE TUNNEL VISORS
-SIGNAL HEADS (PER APPROACH) TO BE A MINIMUM OF 8' APART

POLE CHART

FOOTER OR POLE NO.	TYPE	UPRIGHT POLE: POLE MOUNTED SIGNAL ATTACHMENT DIM "K"	DIM "L"	HEIGHT	O. D.	WALL GA.	LOCATION	LUMINAIRE: SPREAD	LUM. MTD. HEIGHT	ANGLE 'G'
P1	C1L			30'	12"	2Poly 3	AS INDICATED	15'	36'-6"	275°
P2	C1			30'	12"	2Poly 3				
P3	C1L	15'	3'-10"	30'	12"	2Poly 3		10'	36'-6"	185°

- POLES AND ANCHOR BOLTS TO BE SUPPLED BY THE WVDOH
- LUMINAIRE ARMS TO BE SUPPLED BY THE CONTRACTOR

SCALE : 0 — 20 '

LEGEND

- CONTROLLER
- JUNCTION BOX (TYPE H)
- CONDUIT
- SIGNAL POLE
- TRAFFIC SIGNAL HEAD
- VIDEO CAMERA
- DETECTION ZONE
- LUMINAIRE
- UTILITY POLE
- PCS PRIORITY CONTROL SYSTEM
- PCS DETECTOR
- PCS EMITTER

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SIGNAL LAYOUT
KINGWOOD PIKE AT CO. RTE. 857
MORGANTOWN, MONONGALIA CO.

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Signal Timing Field Observation

Project Number: 18-141

Project Name: WV DoH Greenbag Rd P15 T15

NOTES:

Date: 10/17/18

Time: 4PM

Collected By: Andrew Gouty

Intersection: Greenbag & Dorsey/Kingwood

		Mainline (Direction): Greenbag						Side Street: Dorsey/Kingwood					
	Interval: (sketch in phasing/ operation)												
Run 1	G	45 sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 2	G	45 sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 3	G	45 sec						35 sec					
	Y	3 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	91 sec											
Run 4	G	45 sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 5	G	45 sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
AVERAGE	G	(45+45+45+45+45)/5=45						(35+35+35+35+35)/5=35					
	Y	(4+4+3+4+4)/5=		3.8				4					
	AR	2						2					
	Cycle Length	91.8 sec AVG. CC.											

Signal Timing Field Observation

Project Number: 18-141

Project Name: WVDOH Greenbag Rd PIST15

NOTES:

Date: 10/18/18

Time: 7AM

Collected By: Andrew Gouty

Intersection: Greenbag & Dorsey/Kingwood

		Mainline (Direction): Greenbag Rd						Side Street: Dorsey/Kingwood					
	Interval: (sketch in phasing/ operation)												
Run 1	G	45sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 2	G	45 sec						35 sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 3	G	45sec						35sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
Run 4	G	45 sec						35sec					
	Y	4 sec						4sec					
	AR	2 sec						2sec					
	Cycle Length	92sec											
Run 5	G	45sec						35sec					
	Y	4 sec						4 sec					
	AR	2 sec						2 sec					
	Cycle Length	92 sec											
AVERAGE	G	45sec						35sec					
	Y	4 sec						4 sec					
	AR	2sec						2sec					
	Cycle Length	92 sec AVG. CC.											

Greenbag Road (CR 857) & Mississippi Avenue

EASTBOUND GREENBAG ROAD (CR 857) APPROACH: Eastbound Greenbag Road Approach provides 1 shared lane of travel for the left turn and thru movements.





2018 Existing TMC (vph)		
Eastbound		
	Left	Thru
AM	109	240
PM	140	497
Sat.	34	345

Greenbag Road (CR 857) & Mississippi Avenue

WESTBOUND GREENBAG ROAD (CR 857) APPROACH: Westbound Greenbag Road Approach provides 1 shared lane of travel for the thru and right turn movements.





2018 Existing TMC (vph)		
Westbound		
	Thru	Right
AM	412	163
PM	372	132
Sat.	256	30

Greenbag Road (CR 857) & Mississippi Avenue

SOUTHBOUND MISSISSIPPI AVENUE APPROACH: Southbound Mississippi Avenue Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Southbound		
	Left	Right
AM	107	104
PM	41	68
Sat.	21	27

Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

EASTBOUND GREENBAG ROAD (CR 857) APPROACH: Eastbound Greenbag Road Approach provides 1 shared lane of travel for the left turn, thru, and right turn movements.





2018 Existing TMC (vph)			
Eastbound			
	Left	Thru	Right
AM	51	273	26
PM	108	386	110
Sat.	67	239	58

Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

WESTBOUND GREENBAG ROAD (CR 857) APPROACH: Westbound Greenbag Road Approach provides 1 shared lane of travel for the left turn, thru, and right turn movements.





2018 Existing TMC (vph)			
Westbound			
	Left	Thru	Right
AM	23	353	14
PM	87	311	22
Sat.	46	189	18

Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

NORTHBOUND KINGWOOD PIKE (CR 81) APPROACH: Northbound Kingwood Pike Approach provides 1 shared lane of travel for the left turn, thru, and right turn movements.





2018 Existing TMC (vph)			
Northbound			
	Left	Thru	Right
AM	142	149	131
PM	52	58	50
Sat.	43	42	31

Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

SOUTHBOUND DORSEY AVENUE (CR 81) APPROACH: Southbound Dorsey Avenue Approach provides 1 shared lane of travel for the left turn, thru, and right turn movements.





2018 Existing TMC (vph)			
Southbound			
	Left	Thru	Right
AM	63	19	115
PM	99	157	107
Sat.	35	47	62

Greenbag Road (CR 857) & Luckey Lane

EASTBOUND GREENBAG ROAD (CR 857) APPROACH: Eastbound Greenbag Road Approach provides 1 shared lane of travel for the left turn and thru movements.





2018 Existing TMC (vph)		
Eastbound		
	Left	Thru
AM	0	410
PM	0	423
Sat.	0	290

Greenbag Road (CR 857) & Luckey Lane

WESTBOUND GREENBAG ROAD (CR 857) APPROACH: Westbound Greenbag Road Approach provides 1 shared lane of travel for the thru and right turn movements.





2018 Existing TMC (vph)		
Westbound		
	Thru	Right
AM	390	90
PM	418	127
Sat.	252	46

Greenbag Road (CR 857) & Luckey Lane

SOUTHBOUND LUCKEY LANE APPROACH: Southbound Luckey Lane Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Southbound		
	Left	Right
AM	44	0
PM	55	2
Sat.	44	1

Greenbag Road (CR 857) & Luckey Lane

SOUTHBOUND LUCKEY LANE APPROACH: Southbound Luckey Lane Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Southbound		
	Left	Right
AM	44	0
PM	55	2
Sat.	44	1

Greenbag Road (CR 857) & Richard Avenue

EASTBOUND GREENBAG APPROACH: Eastbound Greenbag Road Approach provides 1 shared lane of travel for the left turn and thru movements.





2018 Existing TMC (vph)		
Eastbound		
	Left	Thru
AM	59	395
PM	13	465
Sat.	7	327

Greenbag Road (CR 857) & Richard Avenue

WESTBOUND GREENBAG ROAD APPROACH: Westbound Greenbag Road Approach provides 1 shared lane of travel for the thru and right turn movements.





2018 Existing TMC (vph)		
Westbound		
	Thru	Right
AM	417	51
PM	522	10
Sat.	291	10

Greenbag Road (CR 857) & Richard Avenue

SOUTHBOUND RICHARD AVENUE APPROACH: Southbound Richard Avenue Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Southbound		
	Left	Right
AM	34	63
PM	19	23
Sat.	7	7

Greenbag Road (CR 857) & Lower Aaron's Creek Road (CR 64)

EASTBOUND GREENBAG ROAD (CR 857) APPROACH: Eastbound Greenbag Road (CR 857) Approach provides 1 shared lane of travel for the thru and right turn movements.





2018 Existing TMC (vph)		
Eastbound		
	Thru	Right
AM	444	3
PM	471	9
Sat.	327	4

Greenbag Road (CR 857) & Lower Aaron's Creek Road (CR 64)

WESTBOUND GREENBAG ROAD (CR 857) APPROACH: Westbound Greenbag Road (CR 857) Approach provides 1 shared lane of travel for the left turn and thru movements.





2018 Existing TMC (vph)		
Westbound		
	Left	Thru
AM	4	399
PM	31	477
Sat.	8	282

Greenbag Road (CR 857) & Lower Aaron's Creek Road (CR 64)

NORTHBOUND LOWER AARON'S CREEK ROAD (CR 64) APPROACH: North Lower Aaron's Creek Road (CR 64) Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Northbound		
	Left	Right
AM	17	16
PM	8	12
Sat.	3	17

Greenbag Road (CR 857) & Diamond Avenue

NORTHBOUND GREENBAG ROAD (CR 857) APPROACH: Northbound Greenbag Road (CR 857) Approach provides 1 shared lane of travel for the thru and right turn movements.





2018 Existing TMC (vph)		
Northbound		
	Thru	Right
AM	402	60
PM	371	113
Sat.	298	53

Greenbag Road (CR 857) & Diamond Avenue

SOUTHBOUND GREENBAG ROAD (CR 857) APPROACH: Southbound Greenbag Road (CR 857) Approach provides 1 shared lane of travel for the left turn and thru movements.





2018 Existing TMC (vph)		
Southbound		
	Left	Thru
AM	1	330
PM	5	439
Sat.	0	238

Greenbag Road (CR 857) & Diamond Avenue

WESTBOUND DIAMOND AVENUE APPROACH: Westbound Diamond Avenue Approach provides 1 shared lane of travel for the left turn and right turn movements.





2018 Existing TMC (vph)		
Westbound		
	Left	Right
AM	76	5
PM	65	4
Sat.	40	3

Appendix B. Manual Turning Movement Counts

www.TSTData.com
184 Baker Rd

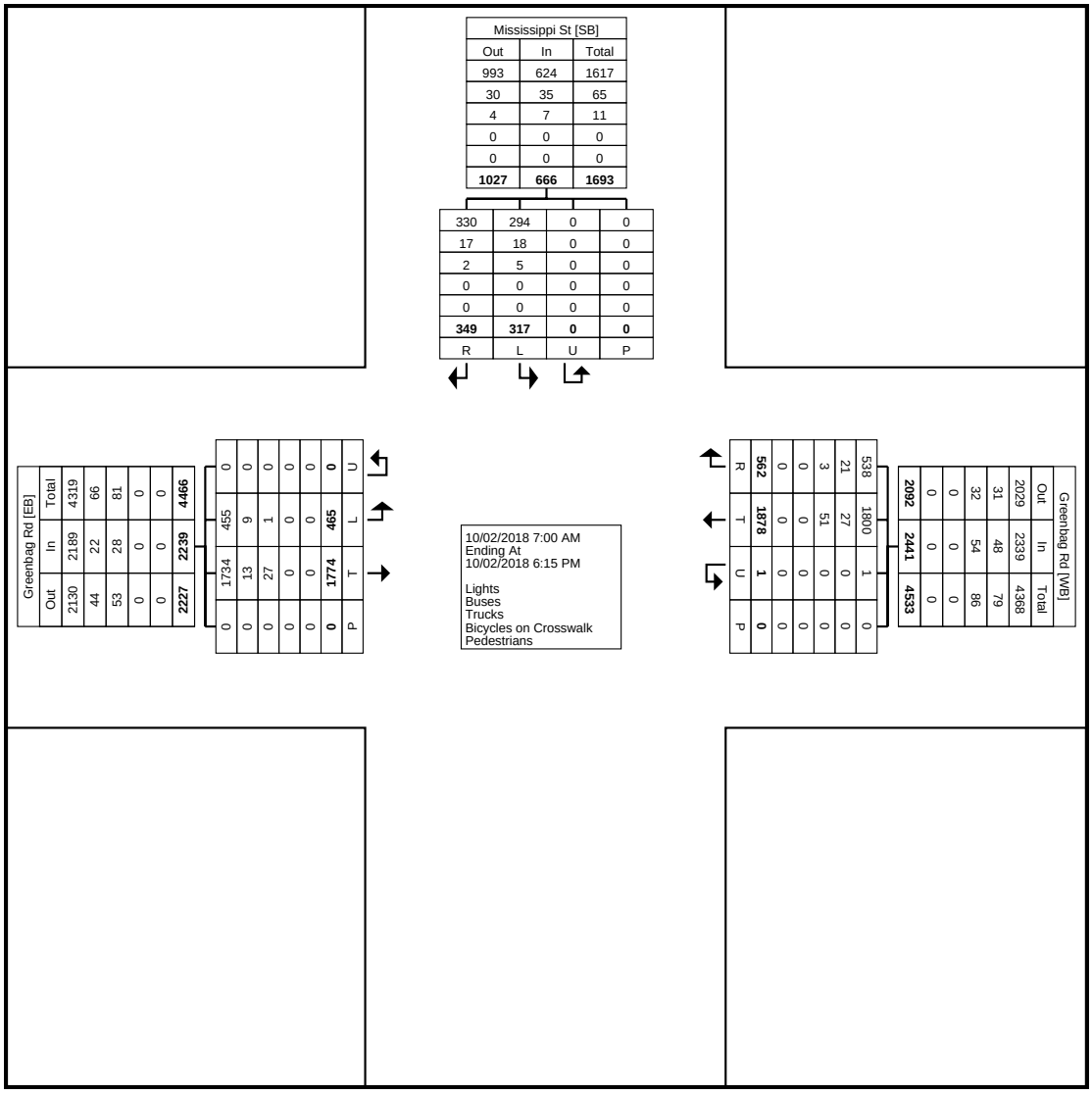
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610-466-1469
Serving Transportation Professionals Since 1995

Morgantown, WV
Greenbag Rd & Mississippi St
Tuesday, October 2, 2018
Location: 39.60843, -79.95508

Count Name: greenbag mississippi
Site Code:
Start Date: 10/02/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	51	44	0	0	95	67	88	0	0	155	41	41	0	0	82	332
7:15 AM	25	66	0	0	91	94	37	0	0	131	39	40	0	0	79	301
7:30 AM	19	55	0	0	74	108	12	0	0	120	13	9	0	0	22	216
7:45 AM	14	75	0	0	89	143	26	0	0	169	14	14	0	0	28	286
Hourly Total	109	240	0	0	349	412	163	0	0	575	107	104	0	0	211	1135
8:00 AM	5	54	0	0	59	101	14	0	0	115	12	15	0	0	27	201
8:15 AM	6	54	0	0	60	92	12	0	0	104	9	7	0	0	16	180
8:30 AM	3	51	0	0	54	118	14	0	0	132	5	11	0	0	16	202
8:45 AM	8	42	0	0	50	96	13	0	0	109	4	13	0	0	17	176
Hourly Total	22	201	0	0	223	407	53	0	0	460	30	46	0	0	76	759
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	17	95	0	0	112	75	17	0	0	92	21	22	0	0	43	247
3:15 PM	17	84	0	0	101	74	19	0	0	93	37	15	0	0	52	246
3:30 PM	23	116	0	0	139	115	29	0	0	144	16	23	0	0	39	322
3:45 PM	27	83	0	0	110	112	31	0	0	143	10	10	0	0	20	273
Hourly Total	84	378	0	0	462	376	96	0	0	472	84	70	0	0	154	1088
4:00 PM	20	111	0	0	131	93	36	0	0	129	10	9	0	0	19	279
4:15 PM	28	99	0	0	127	91	49	0	0	140	12	13	0	0	25	292
4:30 PM	35	121	0	0	156	96	26	0	0	122	14	27	0	0	41	319
4:45 PM	34	118	0	0	152	92	35	0	0	127	9	13	0	0	22	301
Hourly Total	117	449	0	0	566	372	146	0	0	518	45	62	0	0	107	1191
5:00 PM	43	159	0	0	202	93	22	0	0	115	6	15	0	0	21	338
5:15 PM	39	108	0	0	147	79	28	1	0	108	13	16	0	0	29	284
5:30 PM	26	132	0	0	158	79	27	0	0	106	16	9	0	0	25	289
5:45 PM	25	107	0	0	132	60	27	0	0	87	16	27	0	0	43	262
Hourly Total	133	506	0	0	639	311	104	1	0	416	51	67	0	0	118	1173
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	465	1774	0	0	2239	1878	562	1	0	2441	317	349	0	0	666	5346
Approach %	20.8	79.2	0.0	-	-	76.9	23.0	0.0	-	-	47.6	52.4	0.0	-	-	-
Total %	8.7	33.2	0.0	-	41.9	35.1	10.5	0.0	-	45.7	5.9	6.5	0.0	-	12.5	-
Lights	455	1734	0	-	2189	1800	538	1	-	2339	294	330	0	-	624	5152
% Lights	97.8	97.7	-	-	97.8	95.8	95.7	100.0	-	95.8	92.7	94.6	-	-	93.7	96.4
Buses	9	13	0	-	22	27	21	0	-	48	18	17	0	-	35	105
% Buses	1.9	0.7	-	-	1.0	1.4	3.7	0.0	-	2.0	5.7	4.9	-	-	5.3	2.0
Trucks	1	27	0	-	28	51	3	0	-	54	5	2	0	-	7	89
% Trucks	0.2	1.5	-	-	1.3	2.7	0.5	0.0	-	2.2	1.6	0.6	-	-	1.1	1.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Data Plot

www.TSTData.com
184 Baker Rd

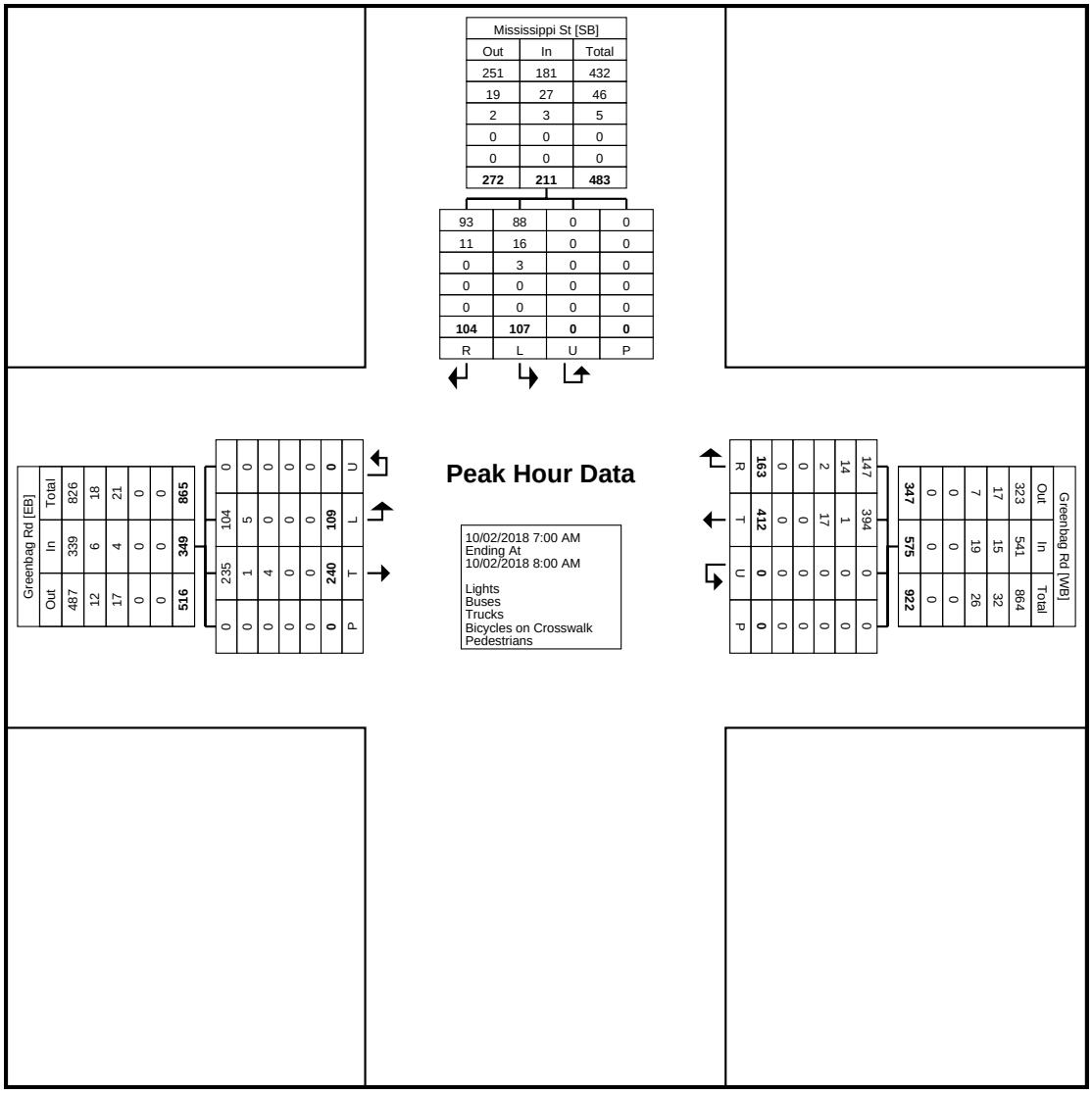
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Morgantown, WV
Greenbag Rd & Mississippi St
Tuesday, October 2, 2018
Location: 39.60843, -79.95508

Count Name: greenbag mississippi
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	51	44	0	0	95	67	88	0	0	155	41	41	0	0	82	332
7:15 AM	25	66	0	0	91	94	37	0	0	131	39	40	0	0	79	301
7:30 AM	19	55	0	0	74	108	12	0	0	120	13	9	0	0	22	216
7:45 AM	14	75	0	0	89	143	26	0	0	169	14	14	0	0	28	286
Total	109	240	0	0	349	412	163	0	0	575	107	104	0	0	211	1135
Approach %	31.2	68.8	0.0	-	-	71.7	28.3	0.0	-	-	50.7	49.3	0.0	-	-	-
Total %	9.6	21.1	0.0	-	30.7	36.3	14.4	0.0	-	50.7	9.4	9.2	0.0	-	18.6	-
PHF	0.534	0.800	0.000	-	0.918	0.720	0.463	0.000	-	0.851	0.652	0.634	0.000	-	0.643	0.855
Lights	104	235	0	-	339	394	147	0	-	541	88	93	0	-	181	1061
% Lights	95.4	97.9	-	-	97.1	95.6	90.2	-	-	94.1	82.2	89.4	-	-	85.8	93.5
Buses	5	1	0	-	6	1	14	0	-	15	16	11	0	-	27	48
% Buses	4.6	0.4	-	-	1.7	0.2	8.6	-	-	2.6	15.0	10.6	-	-	12.8	4.2
Trucks	0	4	0	-	4	17	2	0	-	19	3	0	0	-	3	26
% Trucks	0.0	1.7	-	-	1.1	4.1	1.2	-	-	3.3	2.8	0.0	-	-	1.4	2.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (7:00 AM)

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184 Baker Rd

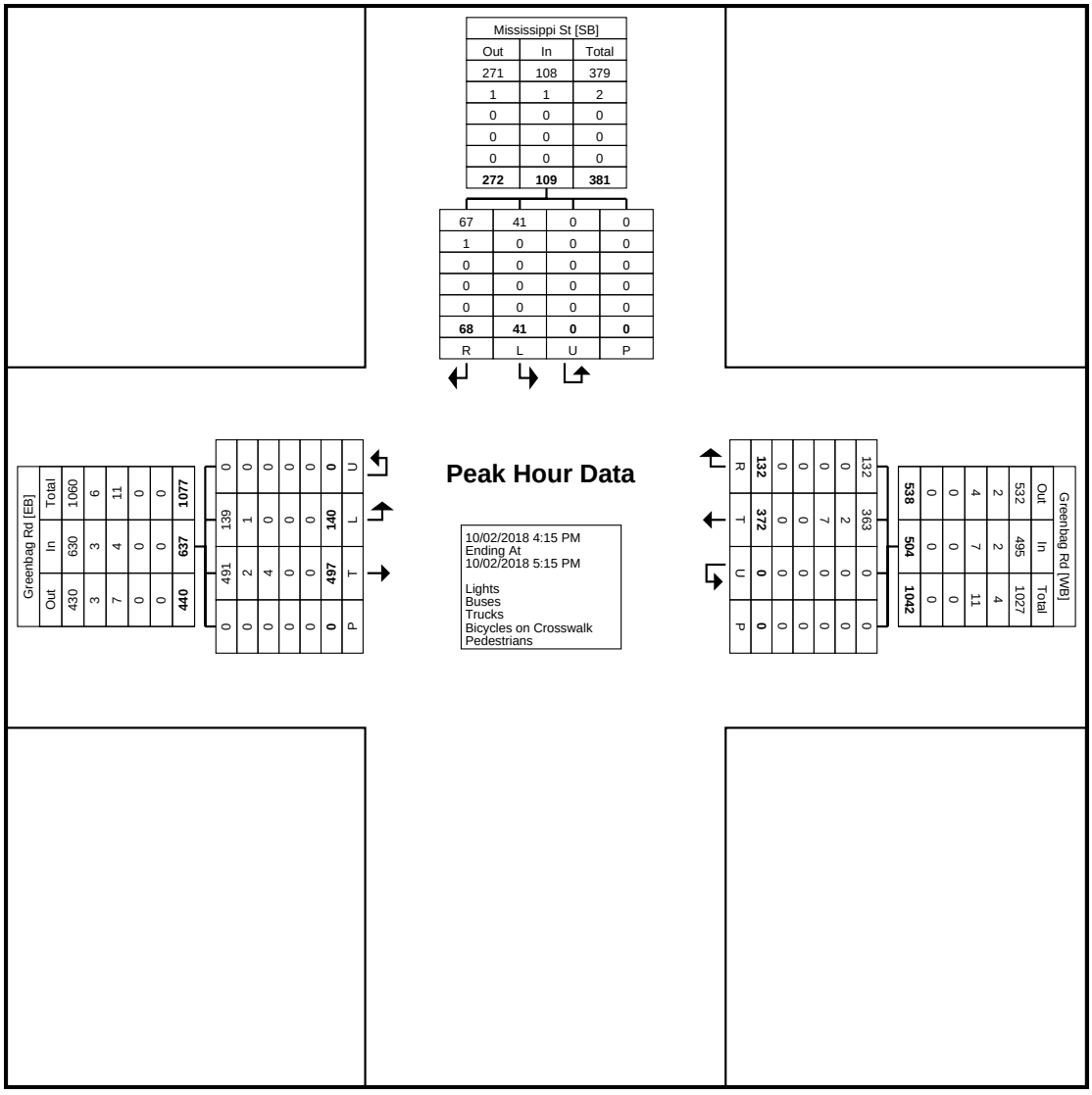
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Morgantown, WV
Greenbag Rd & Mississippi St
Tuesday, October 2, 2018
Location: 39.60843, -79.95508

Count Name: greenbag mississippi
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	28	99	0	0	127	91	49	0	0	140	12	13	0	0	25	292
4:30 PM	35	121	0	0	156	96	26	0	0	122	14	27	0	0	41	319
4:45 PM	34	118	0	0	152	92	35	0	0	127	9	13	0	0	22	301
5:00 PM	43	159	0	0	202	93	22	0	0	115	6	15	0	0	21	338
Total	140	497	0	0	637	372	132	0	0	504	41	68	0	0	109	1250
Approach %	22.0	78.0	0.0	-	-	73.8	26.2	0.0	-	-	37.6	62.4	0.0	-	-	-
Total %	11.2	39.8	0.0	-	51.0	29.8	10.6	0.0	-	40.3	3.3	5.4	0.0	-	8.7	-
PHF	0.814	0.781	0.000	-	0.788	0.969	0.673	0.000	-	0.900	0.732	0.630	0.000	-	0.665	0.925
Lights	139	491	0	-	630	363	132	0	-	495	41	67	0	-	108	1233
% Lights	99.3	98.8	-	-	98.9	97.6	100.0	-	-	98.2	100.0	98.5	-	-	99.1	98.6
Buses	1	2	0	-	3	2	0	0	-	2	0	1	0	-	1	6
% Buses	0.7	0.4	-	-	0.5	0.5	0.0	-	-	0.4	0.0	1.5	-	-	0.9	0.5
Trucks	0	4	0	-	4	7	0	0	-	7	0	0	0	-	0	11
% Trucks	0.0	0.8	-	-	0.6	1.9	0.0	-	-	1.4	0.0	0.0	-	-	0.0	0.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (4:15 PM)

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Morgantown, WV
Greenbag Rd & Mississippi St
Saturday, September 29, 2018
Location: 39.60843, -79.95508

Count Name: greenbag missisippi Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Data

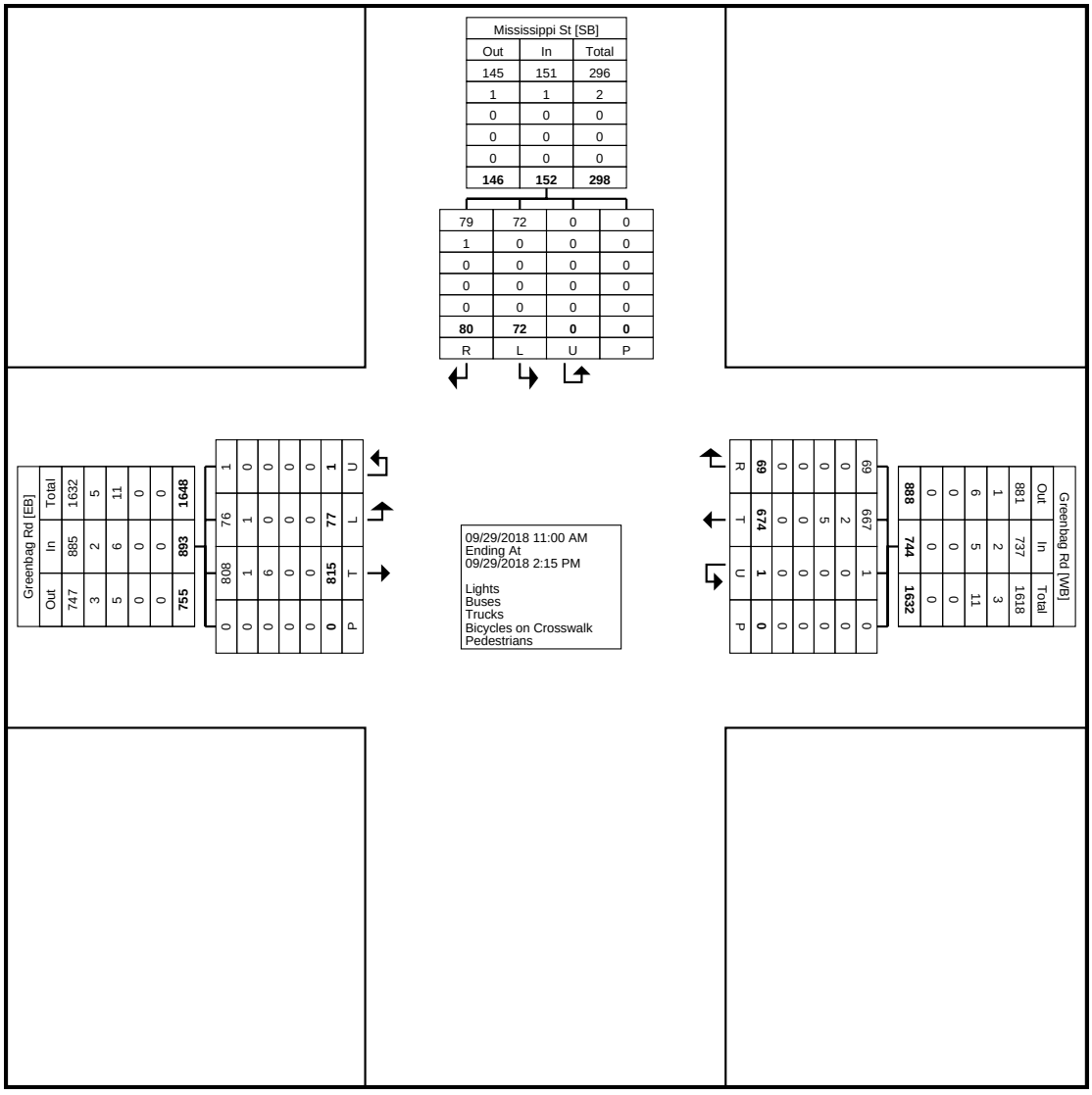
Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	7	67	0	0	74	57	5	0	0	62	3	2	0	0	5	141
11:15 AM	4	74	0	0	78	72	8	0	0	80	3	4	0	0	7	165
11:30 AM	15	87	0	0	102	55	4	0	0	59	8	8	0	0	16	177
11:45 AM	6	104	0	0	110	58	10	0	0	68	7	5	0	0	12	190
Hourly Total	32	332	0	0	364	242	27	0	0	269	21	19	0	0	40	673
12:00 PM	9	80	0	0	89	71	8	0	0	79	3	10	0	0	13	181
12:15 PM	2	74	0	0	76	44	6	0	0	50	6	6	0	0	12	138
12:30 PM	4	53	0	0	57	47	4	0	0	51	4	4	0	0	8	116
12:45 PM	8	64	0	0	72	48	5	1	0	54	2	3	0	0	5	131
Hourly Total	23	271	0	0	294	210	23	1	0	234	15	23	0	0	38	566
1:00 PM	3	42	0	0	45	56	6	0	0	62	6	3	0	0	9	116
1:15 PM	8	61	0	0	69	52	6	0	0	58	19	15	0	0	34	161
1:30 PM	3	45	1	0	49	51	4	0	0	55	6	14	0	0	20	124
1:45 PM	8	64	0	0	72	63	3	0	0	66	5	6	0	0	11	149
Hourly Total	22	212	1	0	235	222	19	0	0	241	36	38	0	0	74	550
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	77	815	1	0	893	674	69	1	0	744	72	80	0	0	152	1789
Approach %	8.6	91.3	0.1	-	-	90.6	9.3	0.1	-	-	47.4	52.6	0.0	-	-	-
Total %	4.3	45.6	0.1	-	49.9	37.7	3.9	0.1	-	41.6	4.0	4.5	0.0	-	8.5	-
Lights	76	808	1	-	885	667	69	1	-	737	72	79	0	-	151	1773
% Lights	98.7	99.1	100.0	-	99.1	99.0	100.0	100.0	-	99.1	100.0	98.8	-	-	99.3	99.1
Buses	1	1	0	-	2	2	0	0	-	2	0	1	0	-	1	5
% Buses	1.3	0.1	0.0	-	0.2	0.3	0.0	0.0	-	0.3	0.0	1.3	-	-	0.7	0.3
Trucks	0	6	0	-	6	5	0	0	-	5	0	0	0	-	0	11
% Trucks	0.0	0.7	0.0	-	0.7	0.7	0.0	0.0	-	0.7	0.0	0.0	-	-	0.0	0.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Location: 39.60843, -79.95508

Count Name: greenbag missisippi Sat
Site Code:
Start Date: 09/29/2018



Turning Movement Data Plot

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Morgantown, WV
Greenbag Rd & Mississippi St
Saturday, September 29, 2018
Location: 39.60843, -79.95508

Count Name: greenbag missisippi Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Peak Hour Data (11:15 AM)

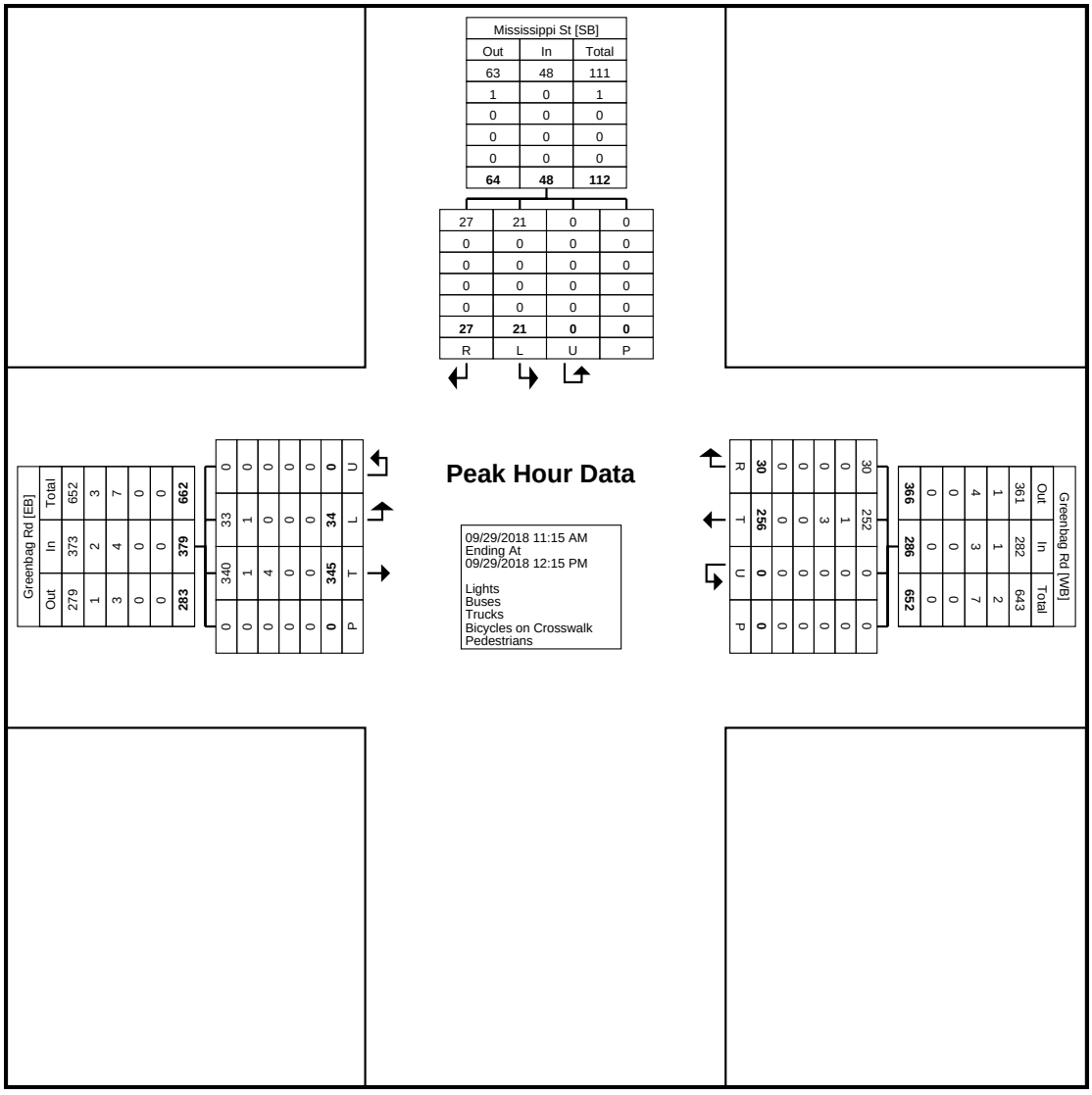
Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:15 AM	4	74	0	0	78	72	8	0	0	80	3	4	0	0	7	165
11:30 AM	15	87	0	0	102	55	4	0	0	59	8	8	0	0	16	177
11:45 AM	6	104	0	0	110	58	10	0	0	68	7	5	0	0	12	190
12:00 PM	9	80	0	0	89	71	8	0	0	79	3	10	0	0	13	181
Total	34	345	0	0	379	256	30	0	0	286	21	27	0	0	48	713
Approach %	9.0	91.0	0.0	-	-	89.5	10.5	0.0	-	-	43.8	56.3	0.0	-	-	-
Total %	4.8	48.4	0.0	-	53.2	35.9	4.2	0.0	-	40.1	2.9	3.8	0.0	-	6.7	-
PHF	0.567	0.829	0.000	-	0.861	0.889	0.750	0.000	-	0.894	0.656	0.675	0.000	-	0.750	0.938
Lights	33	340	0	-	373	252	30	0	-	282	21	27	0	-	48	703
% Lights	97.1	98.6	-	-	98.4	98.4	100.0	-	-	98.6	100.0	100.0	-	-	100.0	98.6
Buses	1	1	0	-	2	1	0	0	-	1	0	0	0	-	0	3
% Buses	2.9	0.3	-	-	0.5	0.4	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.4
Trucks	0	4	0	-	4	3	0	0	-	3	0	0	0	-	0	7
% Trucks	0.0	1.2	-	-	1.1	1.2	0.0	-	-	1.0	0.0	0.0	-	-	0.0	1.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Mississippi St
Saturday, September 29, 2018
Location: 39.60843, -79.95508

Count Name: greenbag missisippi Sat
Site Code:
Start Date: 09/29/2018



Turning Movement Peak Hour Data Plot (11:15 AM)

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Morgantown, WV
Greenbag Rd & Dorsey Ave/Kingood Pk
Tuedsay, October 2, 2018
Location: 39.607314, -79.945062

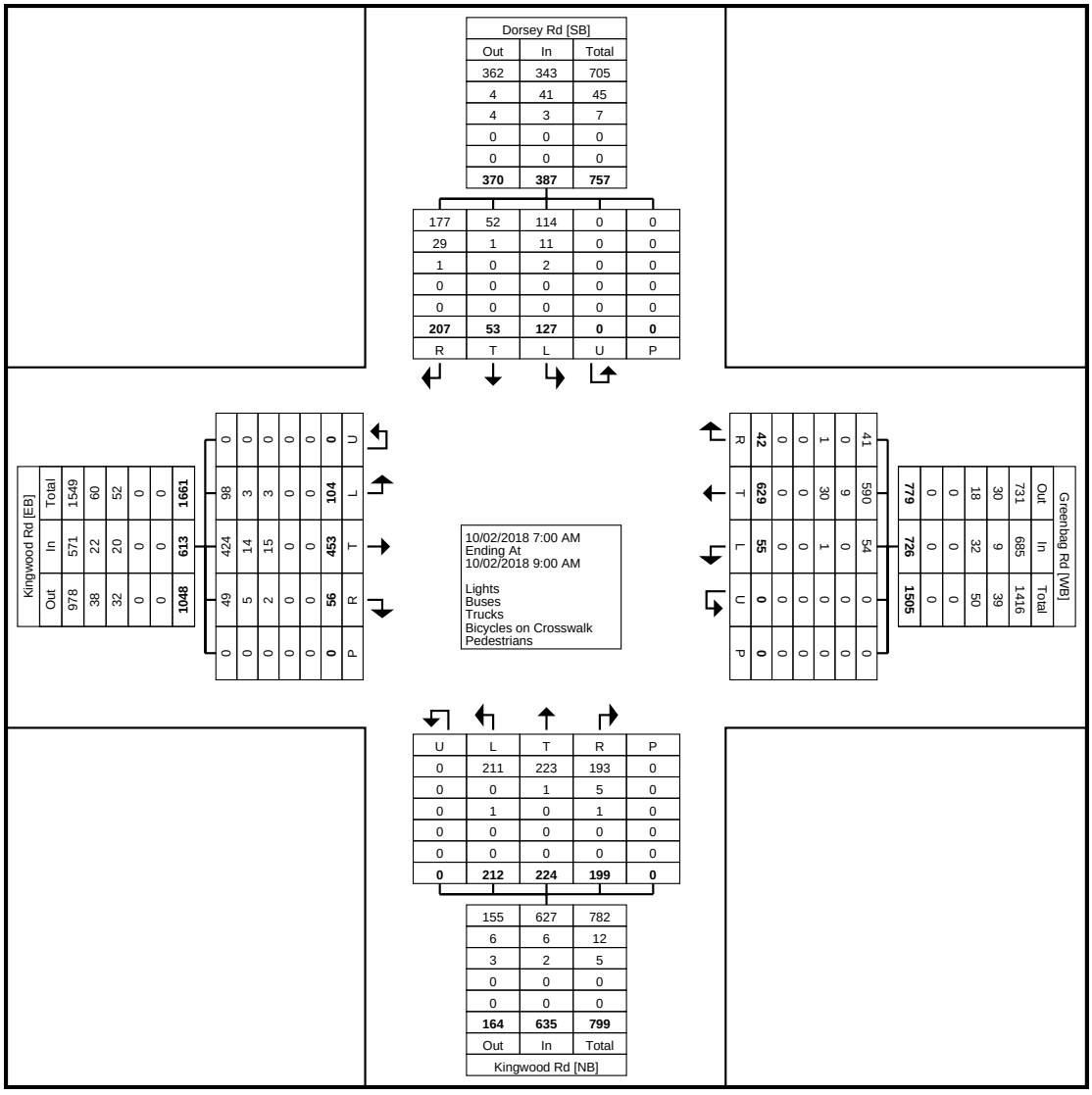
Count Name: greenbag dorsey 2
Site Code:
Start Date: 10/02/2018

Turning Movement Data

Start Time	Kingwood Rd Eastbound						Greenbag Rd Westbound						Kingwood Rd Northbound						Dorsey Rd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	12	44	7	0	0	63	5	106	4	0	0	115	30	32	20	0	0	82	11	4	32	0	0	47	307
7:15 AM	17	85	12	0	0	114	2	67	1	0	0	70	36	29	35	0	0	100	16	6	44	0	0	66	350
7:30 AM	11	46	5	0	0	62	11	61	5	0	0	77	32	48	39	0	0	119	13	6	18	0	0	37	295
7:45 AM	11	80	2	0	0	93	4	100	3	0	0	107	44	40	29	0	0	113	20	3	21	0	0	44	357
Hourly Total	51	255	26	0	0	332	22	334	13	0	0	369	142	149	123	0	0	414	60	19	115	0	0	194	1309
8:00 AM	17	70	6	0	0	93	7	79	5	0	0	91	16	26	24	0	0	66	17	5	13	0	0	35	285
8:15 AM	13	44	7	0	0	64	10	70	6	0	0	86	16	13	20	0	0	49	17	11	16	0	0	44	243
8:30 AM	17	45	9	0	0	71	12	75	11	0	0	98	21	20	18	0	0	59	24	12	39	0	0	75	303
8:45 AM	6	39	8	0	0	53	4	71	7	0	0	82	17	16	14	0	0	47	9	6	24	0	0	39	221
Hourly Total	53	198	30	0	0	281	33	295	29	0	0	357	70	75	76	0	0	221	67	34	92	0	0	193	1052
Grand Total	104	453	56	0	0	613	55	629	42	0	0	726	212	224	199	0	0	635	127	53	207	0	0	387	2361
Approach %	17.0	73.9	9.1	0.0	-	-	7.6	86.6	5.8	0.0	-	-	33.4	35.3	31.3	0.0	-	-	32.8	13.7	53.5	0.0	-	-	-
Total %	4.4	19.2	2.4	0.0	-	26.0	2.3	26.6	1.8	0.0	-	30.7	9.0	9.5	8.4	0.0	-	26.9	5.4	2.2	8.8	0.0	-	16.4	-
Lights	98	424	49	0	-	571	54	590	41	0	-	685	211	223	193	0	-	627	114	52	177	0	-	343	2226
% Lights	94.2	93.6	87.5	-	-	93.1	98.2	93.8	97.6	-	-	94.4	99.5	99.6	97.0	-	-	98.7	89.8	98.1	85.5	-	-	88.6	94.3
Buses	3	14	5	0	-	22	0	9	0	0	-	9	0	1	5	0	-	6	11	1	29	0	-	41	78
% Buses	2.9	3.1	8.9	-	-	3.6	0.0	1.4	0.0	-	-	1.2	0.0	0.4	2.5	-	-	0.9	8.7	1.9	14.0	-	-	10.6	3.3
Trucks	3	15	2	0	-	20	1	30	1	0	-	32	1	0	1	0	-	2	2	0	1	0	-	3	57
% Trucks	2.9	3.3	3.6	-	-	3.3	1.8	4.8	2.4	-	-	4.4	0.5	0.0	0.5	-	-	0.3	1.6	0.0	0.5	-	-	0.8	2.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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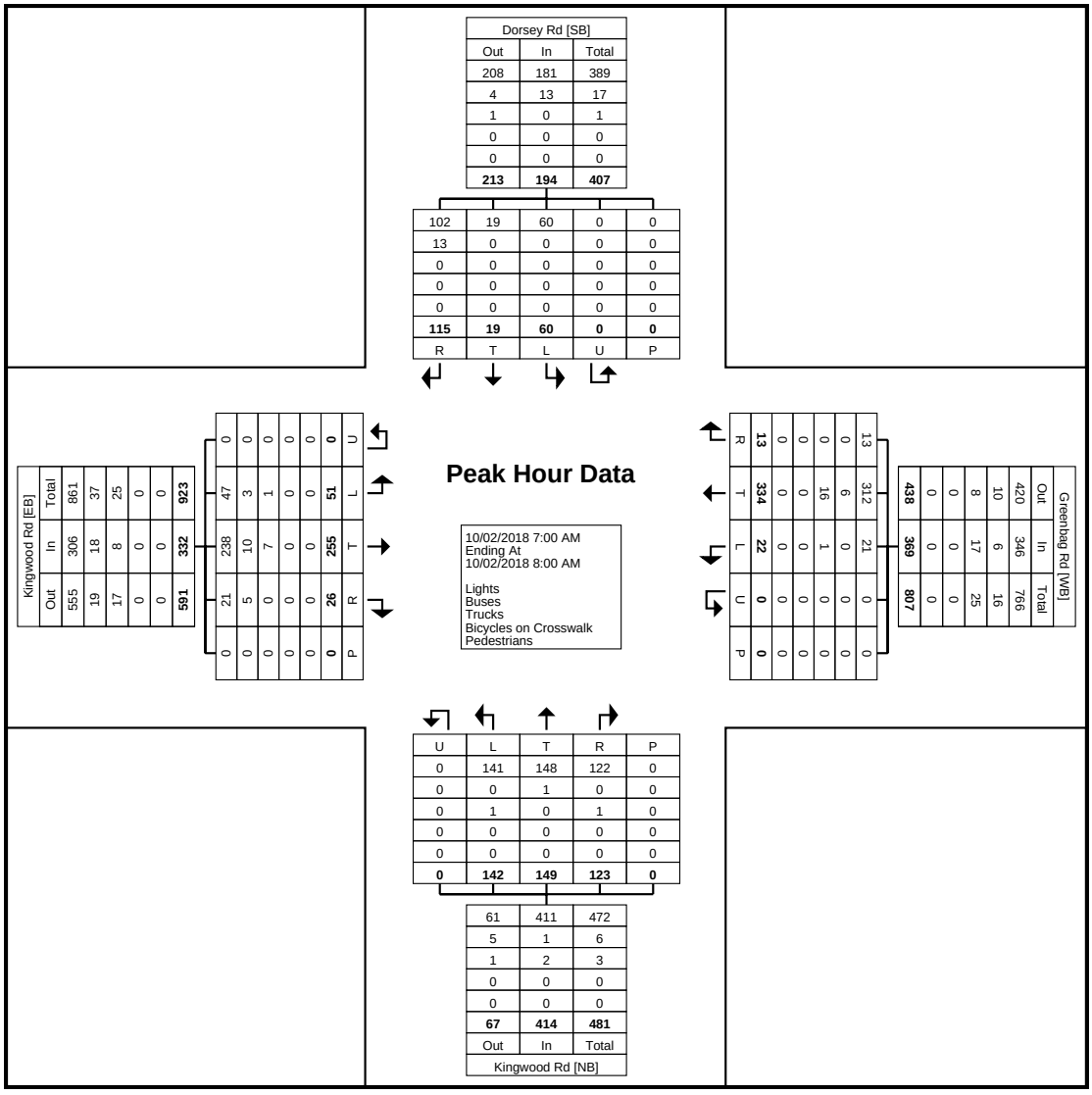
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Morgantown, WV
Greenbag Rd & Dorsey Ave/Kingood Pk
Tuedsay, October 2, 2018
Location: 39.607314, -79.945062

Count Name: greenbag dorsey 2
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kingwood Rd Eastbound						Greenbag Rd Westbound						Kingwood Rd Northbound						Dorsey Rd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	12	44	7	0	0	63	5	106	4	0	0	115	30	32	20	0	0	82	11	4	32	0	0	47	307
7:15 AM	17	85	12	0	0	114	2	67	1	0	0	70	36	29	35	0	0	100	16	6	44	0	0	66	350
7:30 AM	11	46	5	0	0	62	11	61	5	0	0	77	32	48	39	0	0	119	13	6	18	0	0	37	295
7:45 AM	11	80	2	0	0	93	4	100	3	0	0	107	44	40	29	0	0	113	20	3	21	0	0	44	357
Total	51	255	26	0	0	332	22	334	13	0	0	369	142	149	123	0	0	414	60	19	115	0	0	194	1309
Approach %	15.4	76.8	7.8	0.0	-	-	6.0	90.5	3.5	0.0	-	-	34.3	36.0	29.7	0.0	-	-	30.9	9.8	59.3	0.0	-	-	-
Total %	3.9	19.5	2.0	0.0	-	25.4	1.7	25.5	1.0	0.0	-	28.2	10.8	11.4	9.4	0.0	-	31.6	4.6	1.5	8.8	0.0	-	14.8	-
PHF	0.750	0.750	0.542	0.000	-	0.728	0.500	0.788	0.650	0.000	-	0.802	0.807	0.776	0.788	0.000	-	0.870	0.750	0.792	0.653	0.000	-	0.735	0.917
Lights	47	238	21	0	-	306	21	312	13	0	-	346	141	148	122	0	-	411	60	19	102	0	-	181	1244
% Lights	92.2	93.3	80.8	-	-	92.2	95.5	93.4	100.0	-	-	93.8	99.3	99.3	99.2	-	-	99.3	100.0	100.0	88.7	-	-	93.3	95.0
Buses	3	10	5	0	-	18	0	6	0	0	-	6	0	1	0	0	-	1	0	0	13	0	-	13	38
% Buses	5.9	3.9	19.2	-	-	5.4	0.0	1.8	0.0	-	-	1.6	0.0	0.7	0.0	-	-	0.2	0.0	0.0	11.3	-	-	6.7	2.9
Trucks	1	7	0	0	-	8	1	16	0	0	-	17	1	0	1	0	-	2	0	0	0	0	-	0	27
% Trucks	2.0	2.7	0.0	-	-	2.4	4.5	4.8	0.0	-	-	4.6	0.7	0.0	0.8	-	-	0.5	0.0	0.0	0.0	-	-	0.0	2.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (7:00 AM)

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Morgantown, WV
Greenbag Rd & Dorsey Ave/Kingwood Pk
Saturday, September 29, 2018
Location: 39.607314, -79.945062

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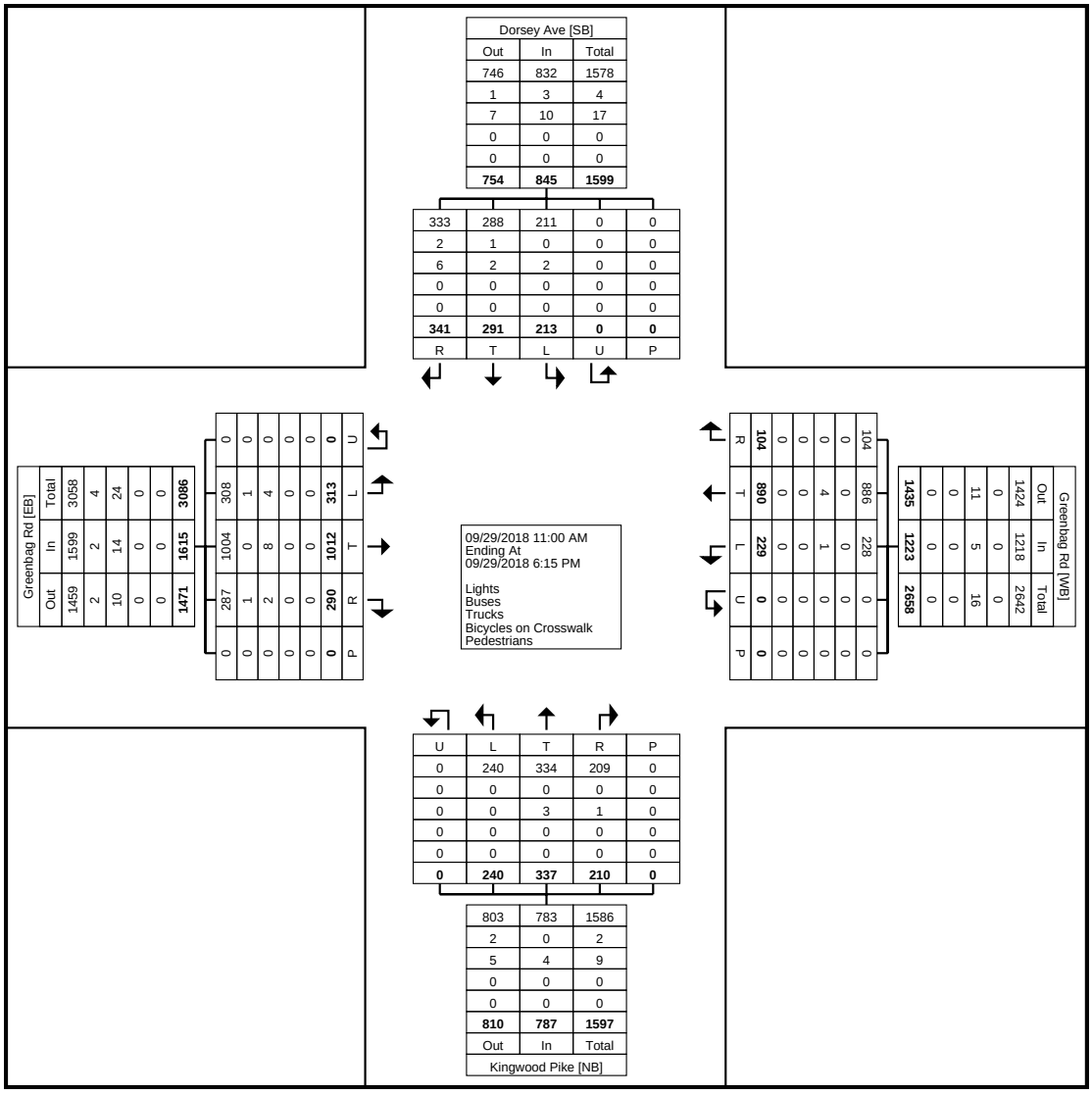
Count Name: greenbag and dorsey Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Pike Northbound						Dorsey Ave Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:00 AM	12	52	12	0	0	76	20	44	1	0	0	65	7	7	7	0	0	21	9	9	12	0	0	30	192
11:15 AM	26	37	19	0	0	82	12	53	4	0	0	69	13	14	7	0	0	34	6	16	13	0	0	35	220
11:30 AM	9	67	8	0	0	84	11	44	5	0	0	60	6	14	11	0	0	31	11	13	18	0	0	42	217
11:45 AM	20	71	17	0	0	108	11	42	5	0	0	58	9	7	4	0	0	20	14	7	15	0	0	36	222
Hourly Total	67	227	56	0	0	350	54	183	15	0	0	252	35	42	29	0	0	106	40	45	58	0	0	143	851
12:00 PM	12	57	14	0	0	83	12	50	4	0	0	66	15	7	9	0	0	31	3	11	16	0	0	30	210
12:15 PM	16	62	13	0	0	91	6	34	3	0	0	43	2	9	9	0	0	20	6	12	16	0	0	34	188
12:30 PM	11	34	10	0	0	55	13	39	2	0	0	54	4	8	5	0	0	17	12	14	10	0	0	36	162
12:45 PM	11	41	11	0	0	63	9	37	1	0	0	47	7	15	12	0	0	34	10	12	7	0	0	29	173
Hourly Total	50	194	48	0	0	292	40	160	10	0	0	210	28	39	35	0	0	102	31	49	49	0	0	129	733
1:00 PM	9	35	9	0	0	53	5	41	4	0	0	50	6	8	5	0	0	19	5	17	13	0	0	35	157
1:15 PM	18	41	12	0	0	71	9	38	6	0	0	53	5	5	8	0	0	18	6	19	13	0	0	38	180
1:30 PM	9	35	9	0	0	53	13	31	4	0	0	48	6	8	4	0	0	18	9	12	12	0	0	33	152
1:45 PM	9	41	13	0	0	63	5	38	6	0	0	49	17	4	7	0	0	28	4	12	14	0	0	30	170
Hourly Total	45	152	43	0	0	240	32	148	20	0	0	200	34	25	24	0	0	83	24	60	52	0	0	136	659
2:00 PM	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3:00 PM	10	28	12	0	0	50	9	34	3	0	0	46	10	20	8	0	0	38	11	11	8	0	0	30	164
3:15 PM	11	37	14	0	0	62	5	38	7	0	0	50	11	11	9	0	0	31	8	12	13	0	0	33	176
3:30 PM	6	48	19	0	0	73	6	28	5	0	0	39	14	18	12	0	0	44	4	8	15	0	0	27	183
3:45 PM	11	38	10	0	0	59	4	27	4	0	0	35	9	27	9	0	0	45	5	5	13	0	0	23	162
Hourly Total	38	151	55	0	0	244	24	127	19	0	0	170	44	76	38	0	0	158	28	36	49	0	0	113	685
4:00 PM	14	43	8	0	0	65	13	25	6	0	0	44	16	21	13	0	0	50	10	15	20	0	0	45	204
4:15 PM	20	50	10	0	0	80	11	48	3	0	0	62	8	12	8	0	0	28	11	8	12	0	0	31	201
4:30 PM	16	40	8	0	0	64	10	45	2	0	0	57	14	22	11	0	0	47	12	11	18	0	0	41	209
4:45 PM	10	27	14	0	0	51	11	30	9	0	0	50	10	21	8	0	0	39	8	9	26	0	0	43	183
Hourly Total	60	160	40	0	0	260	45	148	20	0	0	213	48	76	40	0	0	164	41	43	76	0	0	160	797
5:00 PM	13	38	12	0	0	63	6	39	10	0	0	55	10	26	12	0	0	48	10	13	18	0	0	41	207
5:15 PM	16	30	13	0	0	59	15	26	3	0	0	44	7	15	12	0	0	34	14	16	12	0	0	42	179
5:30 PM	12	34	15	0	0	61	3	25	3	0	0	31	20	17	8	0	0	45	7	18	11	0	0	36	173
5:45 PM	12	26	8	0	0	46	9	33	4	0	0	46	14	21	12	0	0	47	18	11	16	0	0	45	184
Hourly Total	53	128	48	0	0	229	33	123	20	0	0	176	51	79	44	0	0	174	49	58	57	0	0	164	743
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	313	1012	290	0	0	1615	229	890	104	0	0	1223	240	337	210	0	0	787	213	291	341	0	0	845	4470
Approach %	19.4	62.7	18.0	0.0	-	-	18.7	72.8	8.5	0.0	-	-	30.5	42.8	26.7	0.0	-	-	25.2	34.4	40.4	0.0	-	-	-
Total %	7.0	22.6	6.5	0.0	-	36.1	5.1	19.9	2.3	0.0	-	27.4	5.4	7.5	4.7	0.0	-	17.6	4.8	6.5	7.6	0.0	-	18.9	-
Lights	308	1004	287	0	-	1599	228	886	104	0	-	1218	240	334	209	0	-	783	211	288	333	0	-	832	4432
% Lights	98.4	99.2	99.0	-	-	99.0	99.6	99.6	100.0	-	-	99.6	100.0	99.1	99.5	-	-	99.5	99.1	99.0	97.7	-	-	98.5	99.1
Buses	1	0	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0	1	2	0	-	3	5
% Buses	0.3	0.0	0.3	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.6	-	-	0.4	0.1
Trucks	4	8	2	0	-	14	1	4	0	0	-	5	0	3	1	0	-	4	2	2	6	0	-	10	33
% Trucks	1.3	0.8	0.7	-	-	0.9	0.4	0.4	0.0	-	-	0.4	0.0	0.9	0.5	-	-	0.5	0.9	0.7	1.8	-	-	1.2	0.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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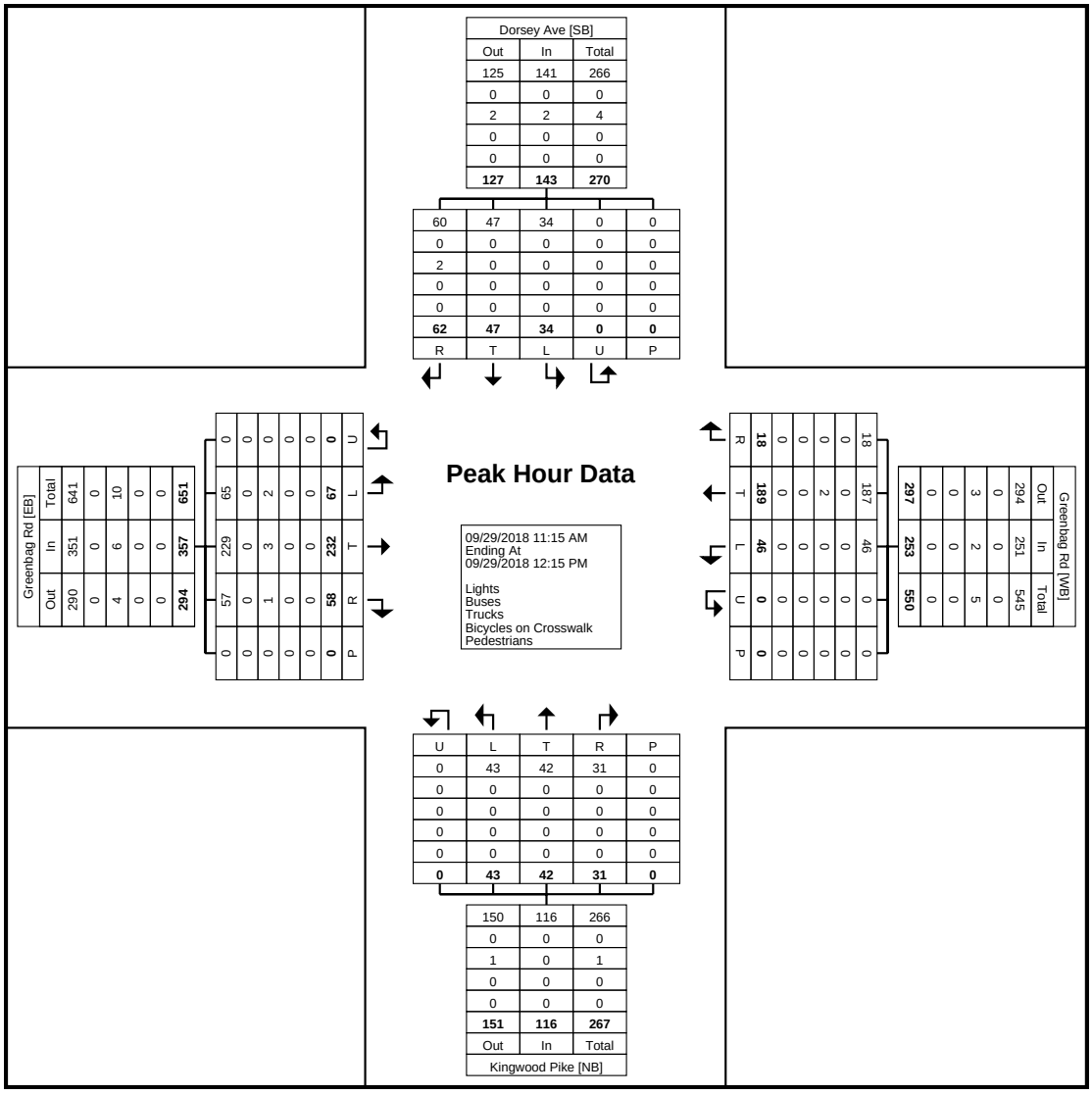
Morgantown, WV
Greenbag Rd & Dorsey Ave/Kingwood Pk
Saturday, September 29, 2018
Location: 39.607314, -79.945062

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Turning Movement Peak Hour Data (11:15 AM)

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Pike Northbound						Dorsey Ave Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:15 AM	26	37	19	0	0	82	12	53	4	0	0	69	13	14	7	0	0	34	6	16	13	0	0	35	220
11:30 AM	9	67	8	0	0	84	11	44	5	0	0	60	6	14	11	0	0	31	11	13	18	0	0	42	217
11:45 AM	20	71	17	0	0	108	11	42	5	0	0	58	9	7	4	0	0	20	14	7	15	0	0	36	222
12:00 PM	12	57	14	0	0	83	12	50	4	0	0	66	15	7	9	0	0	31	3	11	16	0	0	30	210
Total	67	232	58	0	0	357	46	189	18	0	0	253	43	42	31	0	0	116	34	47	62	0	0	143	869
Approach %	18.8	65.0	16.2	0.0	-	-	18.2	74.7	7.1	0.0	-	-	37.1	36.2	26.7	0.0	-	-	23.8	32.9	43.4	0.0	-	-	-
Total %	7.7	26.7	6.7	0.0	-	41.1	5.3	21.7	2.1	0.0	-	29.1	4.9	4.8	3.6	0.0	-	13.3	3.9	5.4	7.1	0.0	-	16.5	-
PHF	0.644	0.817	0.763	0.000	-	0.826	0.958	0.892	0.900	0.000	-	0.917	0.717	0.750	0.705	0.000	-	0.853	0.607	0.734	0.861	0.000	-	0.851	0.979
Lights	65	229	57	0	-	351	46	187	18	0	-	251	43	42	31	0	-	116	34	47	60	0	-	141	859
% Lights	97.0	98.7	98.3	-	-	98.3	100.0	98.9	100.0	-	-	99.2	100.0	100.0	100.0	-	-	100.0	100.0	100.0	96.8	-	-	98.6	98.8
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	2	3	1	0	-	6	0	2	0	0	-	2	0	0	0	0	-	0	0	0	2	0	-	2	10
% Trucks	3.0	1.3	1.7	-	-	1.7	0.0	1.1	0.0	-	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	3.2	-	-	1.4	1.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (11:15 AM)

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Morgantown, PA
Greenbag Rd & Dosey Ave/Kingwood Pike
Tuesday, October 23, 2018
Location: 39.607314, -79.945062

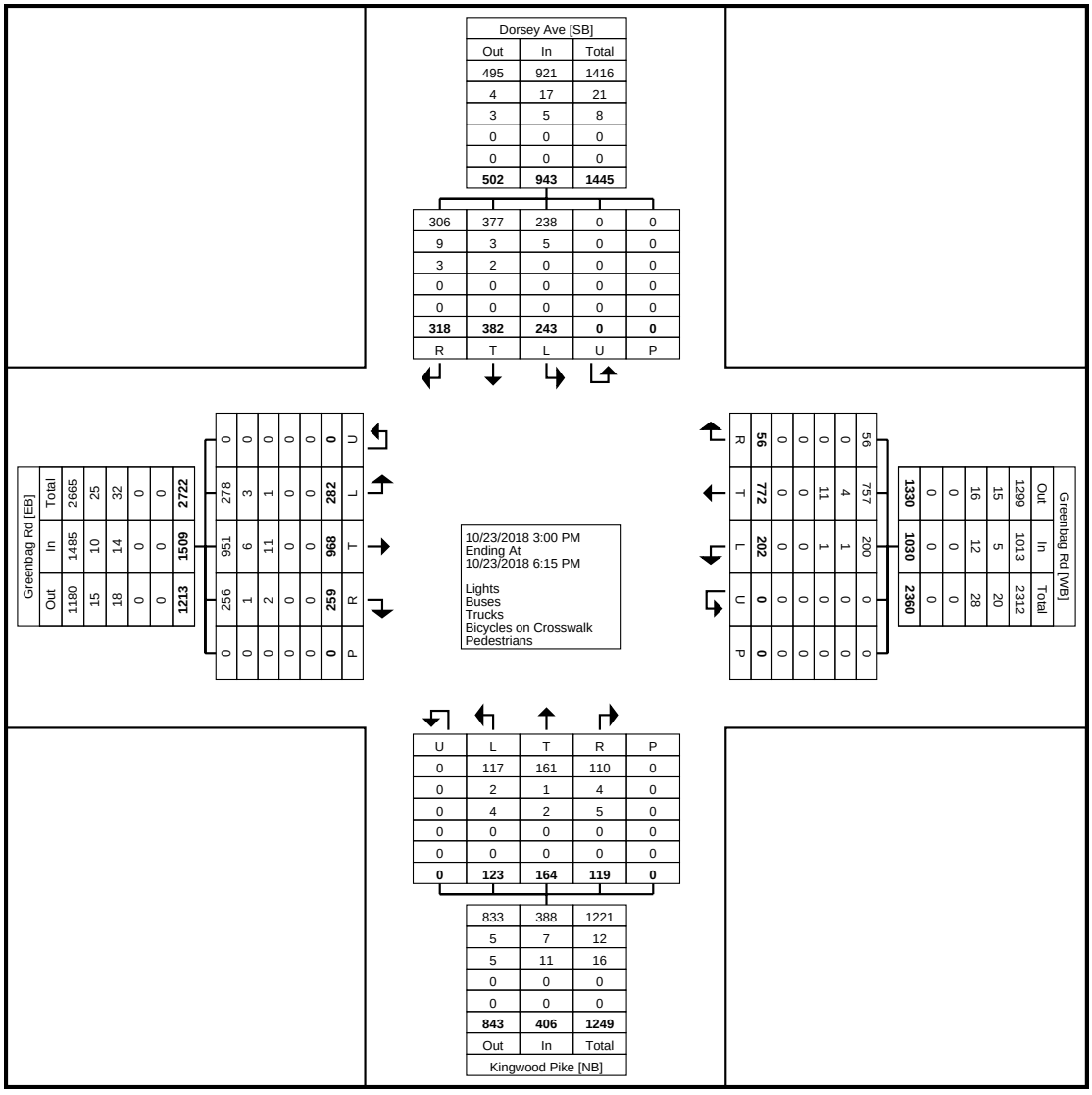
Count Name: Greenbag Rd & Kingwood
Site Code:
Start Date: 10/23/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Pike Northbound						Dorsey Ave Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:00 PM	32	89	12	0	0	133	22	46	5	0	0	73	7	12	8	0	0	27	12	15	21	0	0	48	281
3:15 PM	8	89	18	0	0	115	10	48	3	0	0	61	4	11	10	0	0	25	23	43	22	0	0	88	289
3:30 PM	21	77	14	0	0	112	24	82	8	0	0	114	6	23	12	0	0	41	27	23	33	0	0	83	350
3:45 PM	19	82	17	0	0	118	12	60	3	0	0	75	13	6	9	0	0	28	21	20	27	0	0	68	289
Hourly Total	80	337	61	0	0	478	68	236	19	0	0	323	30	52	39	0	0	121	83	101	103	0	0	287	1209
4:00 PM	21	80	18	0	0	119	10	67	4	0	0	81	13	15	5	0	0	33	19	27	25	0	0	71	304
4:15 PM	17	62	22	0	0	101	20	70	3	0	0	93	11	8	10	0	0	29	21	32	27	0	0	80	303
4:30 PM	30	71	26	0	0	127	20	69	8	0	0	97	7	17	9	0	0	33	17	33	33	0	0	83	340
4:45 PM	28	74	21	0	0	123	26	77	9	0	0	112	12	11	12	0	0	35	20	29	24	0	0	73	343
Hourly Total	96	287	87	0	0	470	76	283	24	0	0	383	43	51	36	0	0	130	77	121	109	0	0	307	1290
5:00 PM	18	98	33	0	0	149	25	80	1	0	0	106	13	24	10	0	0	47	22	45	35	0	0	102	404
5:15 PM	32	91	29	0	0	152	14	59	6	0	0	79	10	9	11	0	0	30	23	33	21	0	0	77	338
5:30 PM	30	83	27	0	0	140	12	59	3	0	0	74	17	14	11	0	0	42	24	50	27	0	0	101	357
5:45 PM	26	72	22	0	0	120	7	55	3	0	0	65	10	14	12	0	0	36	14	32	23	0	0	69	290
Hourly Total	106	344	111	0	0	561	58	253	13	0	0	324	50	61	44	0	0	155	83	160	106	0	0	349	1389
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	282	968	259	0	0	1509	202	772	56	0	0	1030	123	164	119	0	0	406	243	382	318	0	0	943	3888
Approach %	18.7	64.1	17.2	0.0	-	-	19.6	75.0	5.4	0.0	-	-	30.3	40.4	29.3	0.0	-	-	25.8	40.5	33.7	0.0	-	-	-
Total %	7.3	24.9	6.7	0.0	-	38.8	5.2	19.9	1.4	0.0	-	26.5	3.2	4.2	3.1	0.0	-	10.4	6.3	9.8	8.2	0.0	-	24.3	-
Lights	278	951	256	0	-	1485	200	757	56	0	-	1013	117	161	110	0	-	388	238	377	306	0	-	921	3807
% Lights	98.6	98.2	98.8	-	-	98.4	99.0	98.1	100.0	-	-	98.3	95.1	98.2	92.4	-	-	95.6	97.9	98.7	96.2	-	-	97.7	97.9
Buses	3	6	1	0	-	10	1	4	0	0	-	5	2	1	4	0	-	7	5	3	9	0	-	17	39
% Buses	1.1	0.6	0.4	-	-	0.7	0.5	0.5	0.0	-	-	0.5	1.6	0.6	3.4	-	-	1.7	2.1	0.8	2.8	-	-	1.8	1.0
Trucks	1	11	2	0	-	14	1	11	0	0	-	12	4	2	5	0	-	11	0	2	3	0	-	5	42
% Trucks	0.4	1.1	0.8	-	-	0.9	0.5	1.4	0.0	-	-	1.2	3.3	1.2	4.2	-	-	2.7	0.0	0.5	0.9	-	-	0.5	1.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, PA
Greenbag Rd & Dosey Ave/Kingwood Pike
Tuesday, October 23, 2018
Location: 39.607314, -79.945062

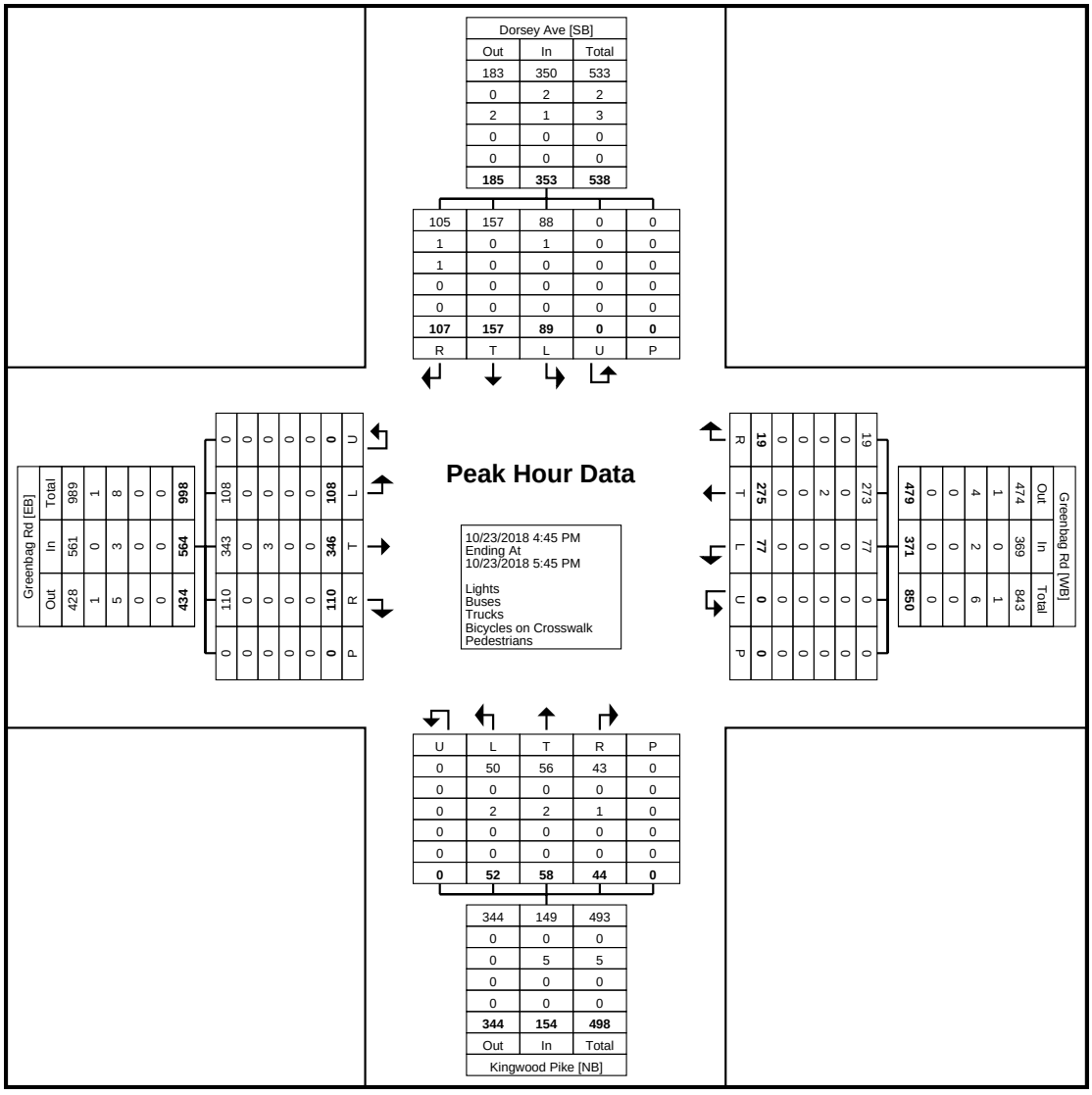
Count Name: Greenbag Rd & Kingwood
Site Code:
Start Date: 10/23/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Pike Northbound						Dorsey Ave Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	28	74	21	0	0	123	26	77	9	0	0	112	12	11	12	0	0	35	20	29	24	0	0	73	343
5:00 PM	18	98	33	0	0	149	25	80	1	0	0	106	13	24	10	0	0	47	22	45	35	0	0	102	404
5:15 PM	32	91	29	0	0	152	14	59	6	0	0	79	10	9	11	0	0	30	23	33	21	0	0	77	338
5:30 PM	30	83	27	0	0	140	12	59	3	0	0	74	17	14	11	0	0	42	24	50	27	0	0	101	357
Total	108	346	110	0	0	564	77	275	19	0	0	371	52	58	44	0	0	154	89	157	107	0	0	353	1442
Approach %	19.1	61.3	19.5	0.0	-	-	20.8	74.1	5.1	0.0	-	-	33.8	37.7	28.6	0.0	-	-	25.2	44.5	30.3	0.0	-	-	-
Total %	7.5	24.0	7.6	0.0	-	39.1	5.3	19.1	1.3	0.0	-	25.7	3.6	4.0	3.1	0.0	-	10.7	6.2	10.9	7.4	0.0	-	24.5	-
PHF	0.844	0.883	0.833	0.000	-	0.928	0.740	0.859	0.528	0.000	-	0.828	0.765	0.604	0.917	0.000	-	0.819	0.927	0.785	0.764	0.000	-	0.865	0.892
Lights	108	343	110	0	-	561	77	273	19	0	-	369	50	56	43	0	-	149	88	157	105	0	-	350	1429
% Lights	100.0	99.1	100.0	-	-	99.5	100.0	99.3	100.0	-	-	99.5	96.2	96.6	97.7	-	-	96.8	98.9	100.0	98.1	-	-	99.2	99.1
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	1	0	-	2	2
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.1	0.0	0.9	-	-	0.6	0.1
Trucks	0	3	0	0	-	3	0	2	0	0	-	2	2	2	1	0	-	5	0	0	1	0	-	1	11
% Trucks	0.0	0.9	0.0	-	-	0.5	0.0	0.7	0.0	-	-	0.5	3.8	3.4	2.3	-	-	3.2	0.0	0.0	0.9	-	-	0.3	0.8
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, PA
Greenbag Rd & Lucky Lane
Tuesday, October 2, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018

Turning Movement Data

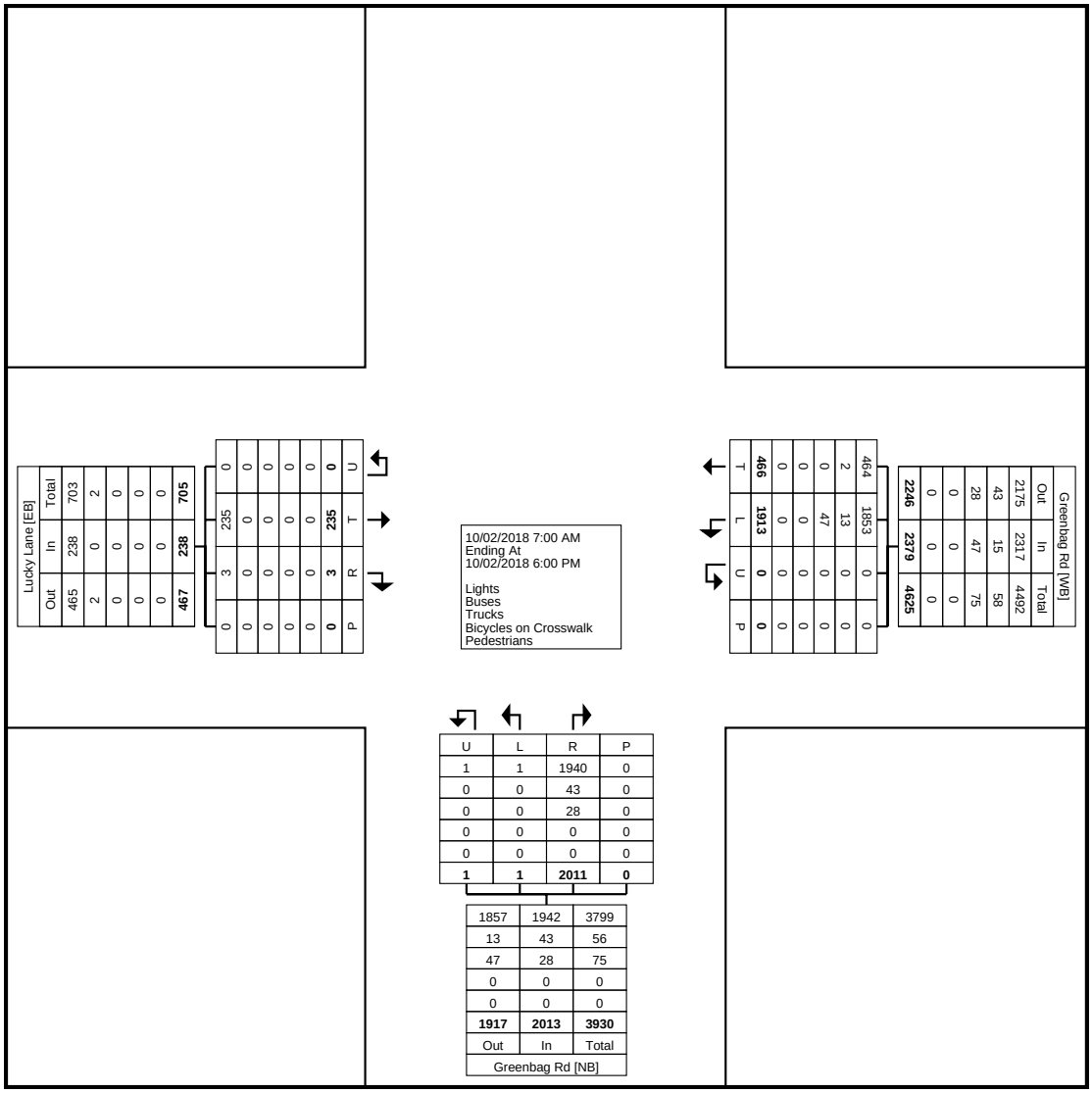
Start Time	Lucky Lane Eastbound					Greenbag Rd Westbound					Greenbag Rd Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	9	0	0	0	9	106	12	0	0	118	0	76	0	0	76	203
7:15 AM	12	0	0	0	12	68	9	0	0	77	0	133	0	0	133	222
7:30 AM	9	0	0	0	9	78	19	0	0	97	0	102	0	0	102	208
7:45 AM	15	0	0	0	15	116	15	0	0	131	0	131	0	0	131	277
Hourly Total	45	0	0	0	45	368	55	0	0	423	0	442	0	0	442	910
8:00 AM	16	0	0	0	16	87	14	0	0	101	0	107	0	0	107	224
8:15 AM	4	0	0	0	4	84	29	0	0	113	0	83	0	0	83	200
8:30 AM	9	0	0	0	9	103	32	0	0	135	0	88	0	0	88	232
8:45 AM	12	0	0	0	12	74	14	0	0	88	0	65	0	0	65	165
Hourly Total	41	0	0	0	41	348	89	0	0	437	0	343	0	0	343	821
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	13	1	0	0	14	86	21	0	0	107	0	79	1	0	80	201
3:15 PM	10	0	0	0	10	87	21	0	0	108	0	115	0	0	115	233
3:30 PM	9	0	0	0	9	152	33	0	0	185	1	74	0	0	75	269
3:45 PM	14	0	0	0	14	91	30	0	0	121	0	106	0	0	106	241
Hourly Total	46	1	0	0	47	416	105	0	0	521	1	374	1	0	376	944
4:00 PM	14	0	0	0	14	90	25	0	0	115	0	104	0	0	104	233
4:15 PM	15	0	0	0	15	99	18	0	0	117	0	92	0	0	92	224
4:30 PM	12	0	0	0	12	116	30	0	0	146	0	106	0	0	106	264
4:45 PM	14	1	0	0	15	112	28	0	0	140	0	102	0	0	102	257
Hourly Total	55	1	0	0	56	417	101	0	0	518	0	404	0	0	404	978
5:00 PM	17	1	0	0	18	103	34	0	0	137	0	106	0	0	106	261
5:15 PM	12	0	0	0	12	87	35	0	0	122	0	109	0	0	109	243
5:30 PM	12	0	0	0	12	97	22	0	0	119	0	109	0	0	109	240
5:45 PM	7	0	0	0	7	77	25	0	0	102	0	124	0	0	124	233
Hourly Total	48	1	0	0	49	364	116	0	0	480	0	448	0	0	448	977
Grand Total	235	3	0	0	238	1913	466	0	0	2379	1	2011	1	0	2013	4630
Approach %	98.7	1.3	0.0	-	-	80.4	19.6	0.0	-	-	0.0	99.9	0.0	-	-	-
Total %	5.1	0.1	0.0	-	5.1	41.3	10.1	0.0	-	51.4	0.0	43.4	0.0	-	43.5	-
Lights	235	3	0	-	238	1853	464	0	-	2317	1	1940	1	-	1942	4497
% Lights	100.0	100.0	-	-	100.0	96.9	99.6	-	-	97.4	100.0	96.5	100.0	-	96.5	97.1
Buses	0	0	0	-	0	13	2	0	-	15	0	43	0	-	43	58
% Buses	0.0	0.0	-	-	0.0	0.7	0.4	-	-	0.6	0.0	2.1	0.0	-	2.1	1.3
Trucks	0	0	0	-	0	47	0	0	-	47	0	28	0	-	28	75
% Trucks	0.0	0.0	-	-	0.0	2.5	0.0	-	-	2.0	0.0	1.4	0.0	-	1.4	1.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Greenbag Rd & Lucky Lane
Tuesday, October 2, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

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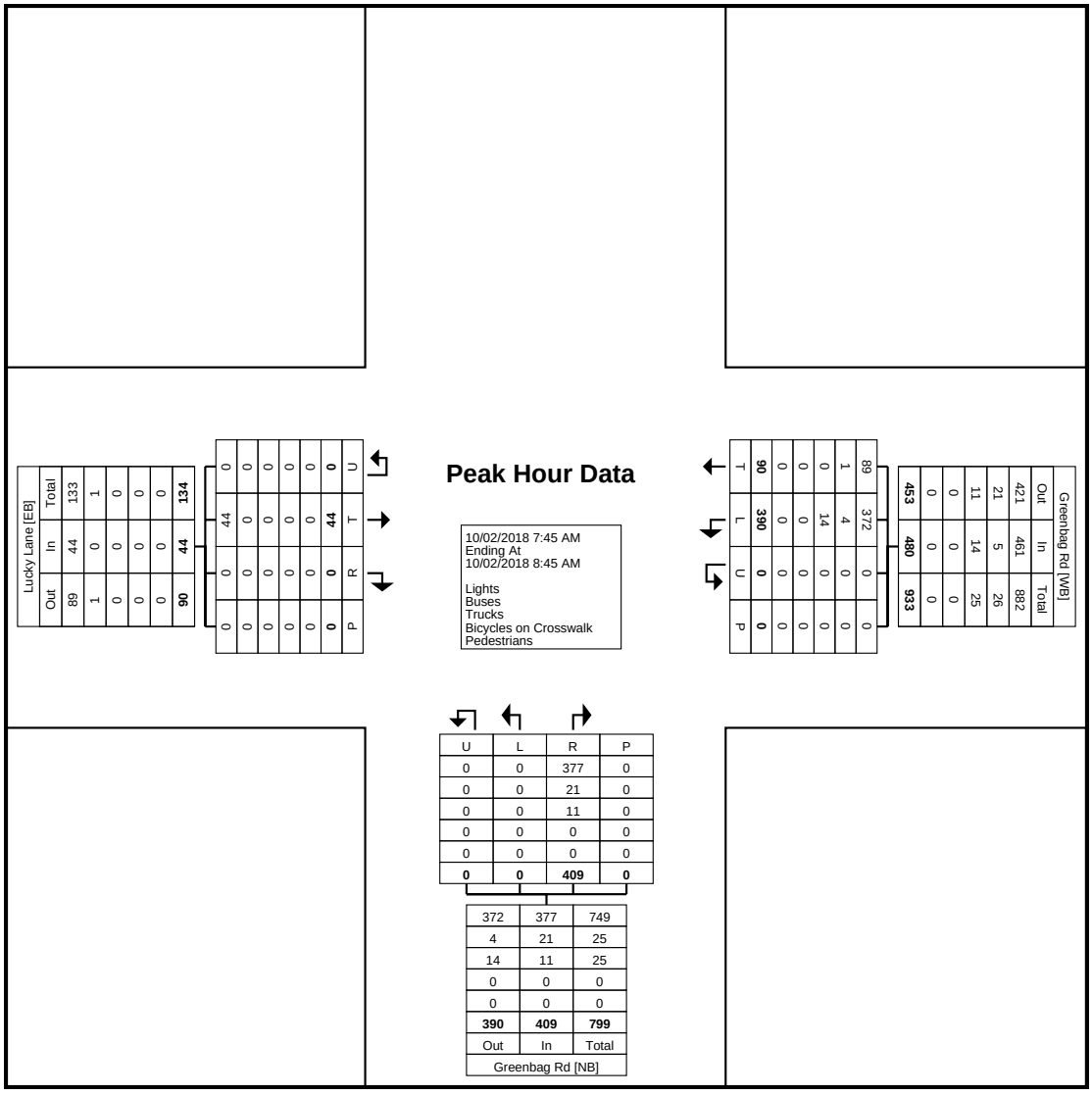
Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Lucky Lane Eastbound					Greenbag Rd Westbound					Greenbag Rd Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:45 AM	15	0	0	0	15	116	15	0	0	131	0	131	0	0	131	277
8:00 AM	16	0	0	0	16	87	14	0	0	101	0	107	0	0	107	224
8:15 AM	4	0	0	0	4	84	29	0	0	113	0	83	0	0	83	200
8:30 AM	9	0	0	0	9	103	32	0	0	135	0	88	0	0	88	232
Total	44	0	0	0	44	390	90	0	0	480	0	409	0	0	409	933
Approach %	100.0	0.0	0.0	-	-	81.3	18.8	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	4.7	0.0	0.0	-	4.7	41.8	9.6	0.0	-	51.4	0.0	43.8	0.0	-	43.8	-
PHF	0.688	0.000	0.000	-	0.688	0.841	0.703	0.000	-	0.889	0.000	0.781	0.000	-	0.781	0.842
Lights	44	0	0	-	44	372	89	0	-	461	0	377	0	-	377	882
% Lights	100.0	-	-	-	100.0	95.4	98.9	-	-	96.0	-	92.2	-	-	92.2	94.5
Buses	0	0	0	-	0	4	1	0	-	5	0	21	0	-	21	26
% Buses	0.0	-	-	-	0.0	1.0	1.1	-	-	1.0	-	5.1	-	-	5.1	2.8
Trucks	0	0	0	-	0	14	0	0	-	14	0	11	0	-	11	25
% Trucks	0.0	-	-	-	0.0	3.6	0.0	-	-	2.9	-	2.7	-	-	2.7	2.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Morgantown, PA
Greenbag Rd & Lucky Lane
Tuesday, October 2, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018



U	L	R	P
0	0	377	0
0	0	21	0
0	0	11	0
0	0	0	0
0	0	0	0
0	**0**	**409**	**0**

372	377	749
4	21	25
14	11	25
0	0	0
0	0	0
390	**409**	**799**
Out	In	Total

Turning Movement Peak Hour Data Plot (7:45 AM)

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Morgantown, PA
Greenbag Rd & Lucky Lane
Tuesday, October 2, 2018
Location: 39.609678, -79.942573

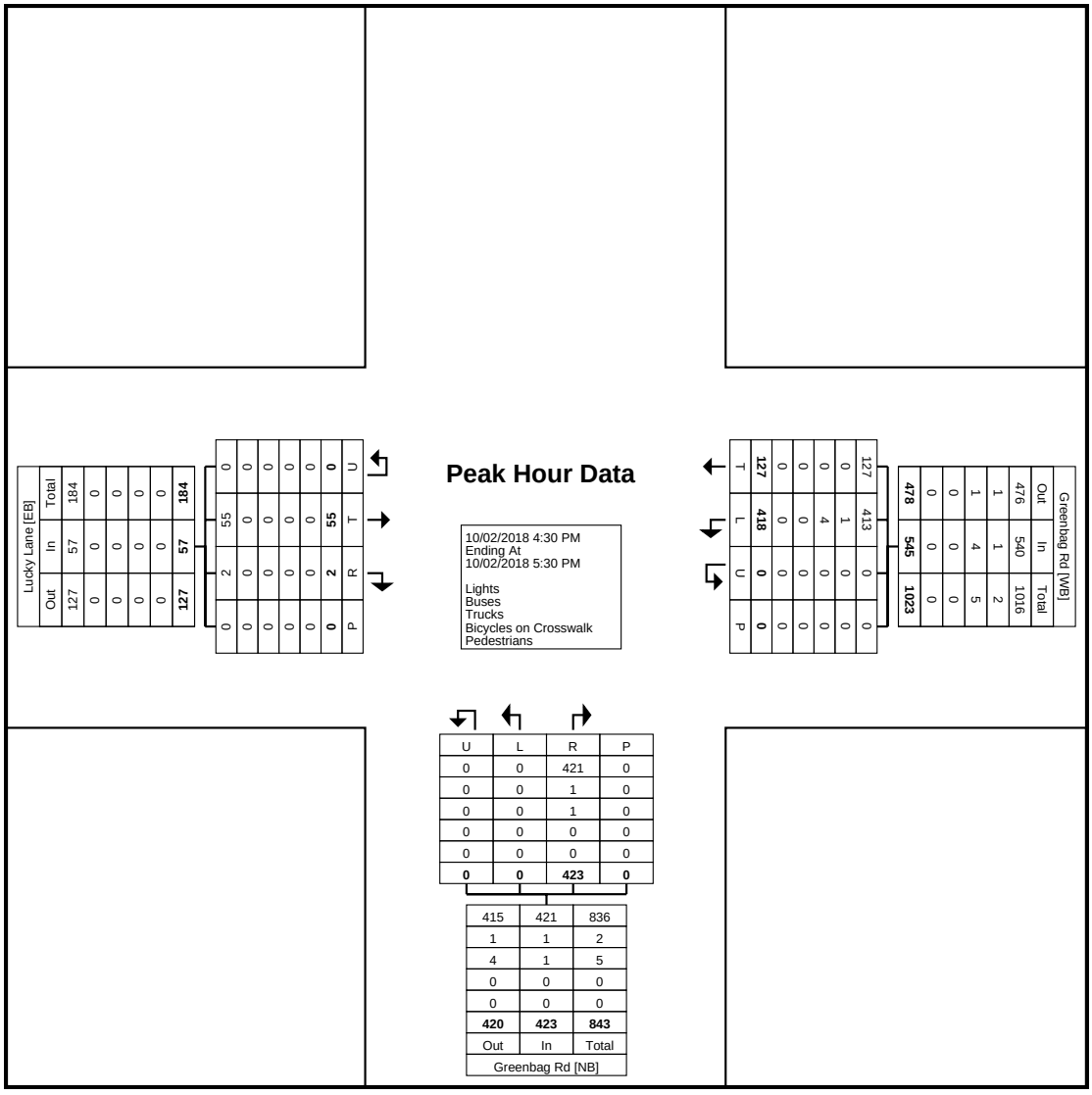
Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Lucky Lane Eastbound					Greenbag Rd Westbound					Greenbag Rd Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:30 PM	12	0	0	0	12	116	30	0	0	146	0	106	0	0	106	264
4:45 PM	14	1	0	0	15	112	28	0	0	140	0	102	0	0	102	257
5:00 PM	17	1	0	0	18	103	34	0	0	137	0	106	0	0	106	261
5:15 PM	12	0	0	0	12	87	35	0	0	122	0	109	0	0	109	243
Total	55	2	0	0	57	418	127	0	0	545	0	423	0	0	423	1025
Approach %	96.5	3.5	0.0	-	-	76.7	23.3	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	5.4	0.2	0.0	-	5.6	40.8	12.4	0.0	-	53.2	0.0	41.3	0.0	-	41.3	-
PHF	0.809	0.500	0.000	-	0.792	0.901	0.907	0.000	-	0.933	0.000	0.970	0.000	-	0.970	0.971
Lights	55	2	0	-	57	413	127	0	-	540	0	421	0	-	421	1018
% Lights	100.0	100.0	-	-	100.0	98.8	100.0	-	-	99.1	-	99.5	-	-	99.5	99.3
Buses	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Buses	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	-	0.2	-	-	0.2	0.2
Trucks	0	0	0	-	0	4	0	0	-	4	0	1	0	-	1	5
% Trucks	0.0	0.0	-	-	0.0	1.0	0.0	-	-	0.7	-	0.2	-	-	0.2	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Morgantown, PA
Greenbag Rd & Lucky Lane
Tuesday, October 2, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky
Site Code:
Start Date: 10/02/2018



U	L	R	P
0	0	421	0
0	0	1	0
0	0	1	0
0	0	0	0
0	0	0	0
0	**0**	**423**	**0**

415	421	836
1	1	2
4	1	5
0	0	0
0	0	0
420	**423**	**843**
Out	In	Total

Turning Movement Peak Hour Data Plot (4:30 PM)

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Morgantown, WV
Greenbag Rd & Lucky Lane
Saturday, September 29, 2018
Location: 39.609678, -79.942573

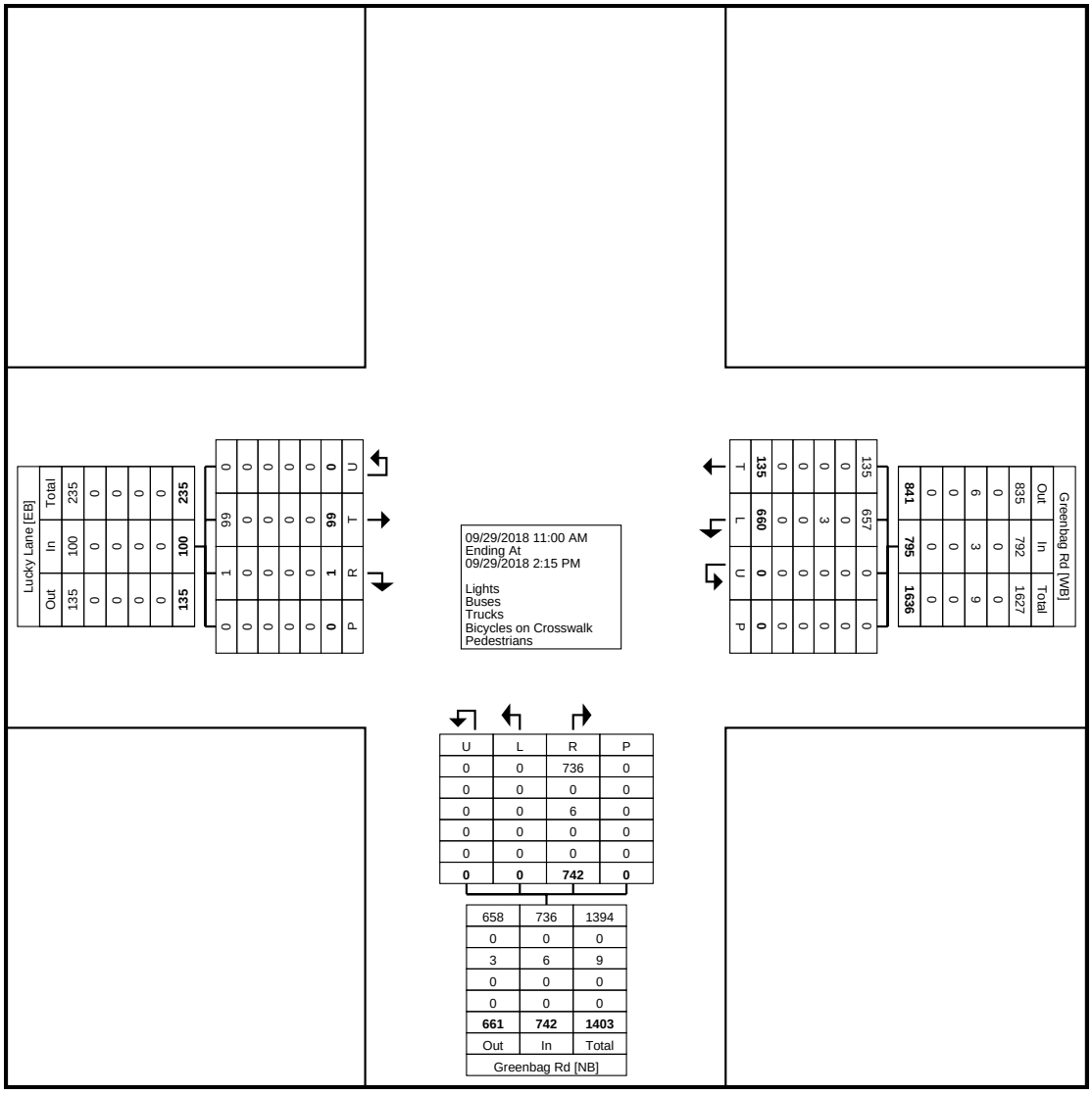
Count Name: greenbag lucky Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Data

Start Time	Lucky Lane Eastbound					Greenbag Rd Westbound					Greenbag Rd Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	9	0	0	0	9	60	13	0	0	73	0	68	0	0	68	150
11:15 AM	11	1	0	0	12	71	13	0	0	84	0	49	0	0	49	145
11:30 AM	14	0	0	0	14	54	10	0	0	64	0	85	0	0	85	163
11:45 AM	10	0	0	0	10	66	10	0	0	76	0	87	0	0	87	173
Hourly Total	44	1	0	0	45	251	46	0	0	297	0	289	0	0	289	631
12:00 PM	7	0	0	0	7	62	12	0	0	74	0	66	0	0	66	147
12:15 PM	3	0	0	0	3	40	10	0	0	50	0	75	0	0	75	128
12:30 PM	12	0	0	0	12	54	10	0	0	64	0	53	0	0	53	129
12:45 PM	7	0	0	0	7	49	13	0	0	62	0	59	0	0	59	128
Hourly Total	29	0	0	0	29	205	45	0	0	250	0	253	0	0	253	532
1:00 PM	4	0	0	0	4	53	11	0	0	64	0	47	0	0	47	115
1:15 PM	5	0	0	0	5	50	11	0	0	61	0	53	0	0	53	119
1:30 PM	7	0	0	0	7	51	10	0	0	61	0	50	0	0	50	118
1:45 PM	10	0	0	0	10	50	12	0	0	62	0	50	0	0	50	122
Hourly Total	26	0	0	0	26	204	44	0	0	248	0	200	0	0	200	474
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	99	1	0	0	100	660	135	0	0	795	0	742	0	0	742	1637
Approach %	99.0	1.0	0.0	-	-	83.0	17.0	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	6.0	0.1	0.0	-	6.1	40.3	8.2	0.0	-	48.6	0.0	45.3	0.0	-	45.3	-
Lights	99	1	0	-	100	657	135	0	-	792	0	736	0	-	736	1628
% Lights	100.0	100.0	-	-	100.0	99.5	100.0	-	-	99.6	-	99.2	-	-	99.2	99.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0
Trucks	0	0	0	-	0	3	0	0	-	3	0	6	0	-	6	9
% Trucks	0.0	0.0	-	-	0.0	0.5	0.0	-	-	0.4	-	0.8	-	-	0.8	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Morgantown, WV
Greenbag Rd & Lucky Lane
Saturday, September 29, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky Sat
Site Code:
Start Date: 09/29/2018



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Morgantown, WV
Greenbag Rd & Lucky Lane
Saturday, September 29, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Peak Hour Data (11:00 AM)

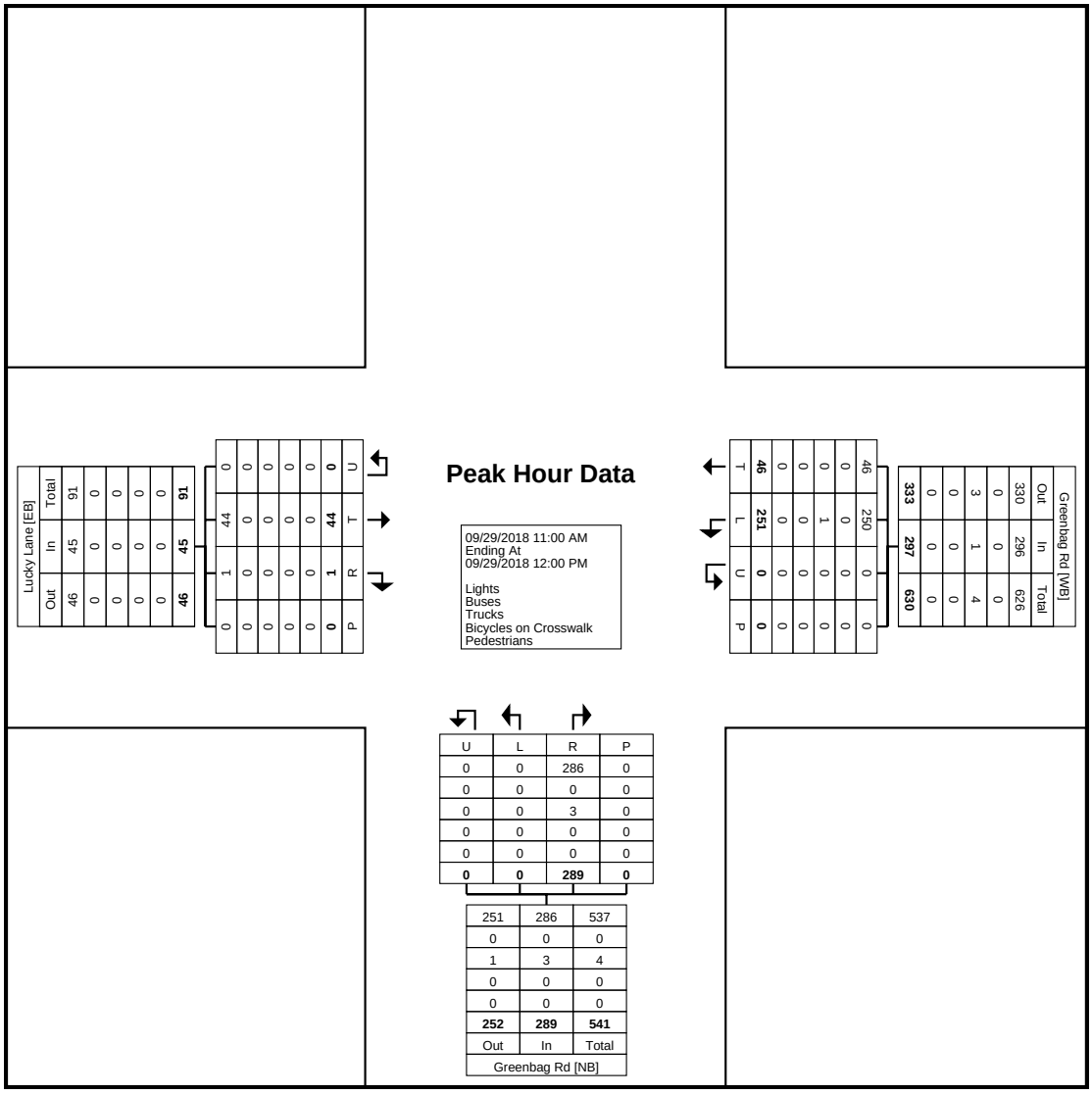
Start Time	Lucky Lane Eastbound					Greenbag Rd Westbound					Greenbag Rd Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
11:00 AM	9	0	0	0	9	60	13	0	0	73	0	68	0	0	68	150
11:15 AM	11	1	0	0	12	71	13	0	0	84	0	49	0	0	49	145
11:30 AM	14	0	0	0	14	54	10	0	0	64	0	85	0	0	85	163
11:45 AM	10	0	0	0	10	66	10	0	0	76	0	87	0	0	87	173
Total	44	1	0	0	45	251	46	0	0	297	0	289	0	0	289	631
Approach %	97.8	2.2	0.0	-	-	84.5	15.5	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	7.0	0.2	0.0	-	7.1	39.8	7.3	0.0	-	47.1	0.0	45.8	0.0	-	45.8	-
PHF	0.786	0.250	0.000	-	0.804	0.884	0.885	0.000	-	0.884	0.000	0.830	0.000	-	0.830	0.912
Lights	44	1	0	-	45	250	46	0	-	296	0	286	0	-	286	627
% Lights	100.0	100.0	-	-	100.0	99.6	100.0	-	-	99.7	-	99.0	-	-	99.0	99.4
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0
Trucks	0	0	0	-	0	1	0	0	-	1	0	3	0	-	3	4
% Trucks	0.0	0.0	-	-	0.0	0.4	0.0	-	-	0.3	-	1.0	-	-	1.0	0.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Lucky Lane
Saturday, September 29, 2018
Location: 39.609678, -79.942573

Count Name: greenbag lucky Sat
Site Code:
Start Date: 09/29/2018
Page No: 4



U	L	R	P
0	0	286	0
0	0	0	0
0	0	3	0
0	0	0	0
0	0	0	0
0	**0**	**289**	**0**

251	286	537
0	0	0
1	3	4
0	0	0
0	0	0
252	**289**	**541**
Out	In	Total
Greenbag Rd [NB]		

Turning Movement Peak Hour Data Plot (11:00 AM)

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Morgantown, WV
Greenbag Rd & Richard Ave
Tuesday, October 2, 2018
Location: 39.609916, -79.941852

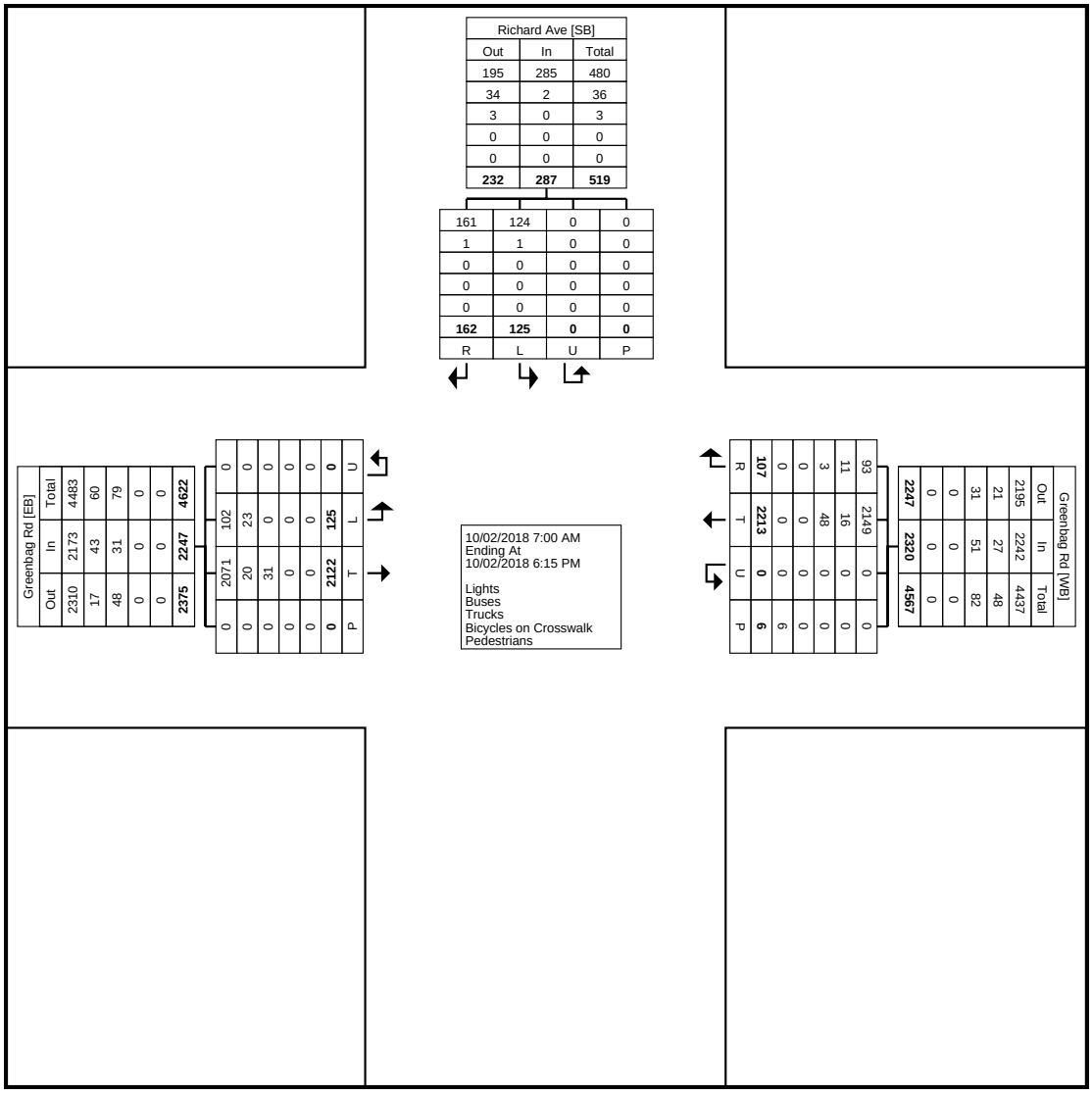
Count Name: greenbag richard
Site Code:
Start Date: 10/02/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Richard Ave Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	5	79	0	0	84	118	4	0	0	122	0	0	0	0	0	206
7:15 AM	6	138	0	0	144	75	5	0	0	80	3	1	0	0	4	228
7:30 AM	7	103	0	0	110	96	9	0	0	105	3	1	0	0	4	219
7:45 AM	12	135	0	0	147	128	18	0	0	146	0	3	0	0	3	296
Hourly Total	30	455	0	0	485	417	36	0	0	453	6	5	0	0	11	949
8:00 AM	13	110	0	0	123	100	17	0	0	117	1	2	0	0	3	243
8:15 AM	18	68	0	0	86	99	8	0	0	107	4	14	0	0	18	211
8:30 AM	16	82	0	0	98	90	8	0	6	98	29	44	0	0	73	269
8:45 AM	5	71	0	0	76	77	2	0	0	79	4	11	0	0	15	170
Hourly Total	52	331	0	0	383	366	35	0	6	401	38	71	0	0	109	893
9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	3	87	0	0	90	104	8	0	0	112	2	1	0	0	3	205
3:15 PM	13	115	0	0	128	106	5	0	0	111	4	1	0	0	5	244
3:30 PM	1	83	0	0	84	161	3	0	0	164	27	24	0	0	51	299
3:45 PM	5	116	0	0	121	110	3	0	0	113	14	12	0	0	26	260
Hourly Total	22	401	0	0	423	481	19	0	0	500	47	38	0	0	85	1008
4:00 PM	0	118	0	0	118	111	1	0	0	112	7	4	0	0	11	241
4:15 PM	2	105	0	0	107	115	2	0	0	117	1	2	0	0	3	227
4:30 PM	2	116	0	0	118	140	2	0	0	142	1	6	0	0	7	267
4:45 PM	3	112	0	0	115	135	1	0	0	136	3	5	0	0	8	259
Hourly Total	7	451	0	0	458	501	6	0	0	507	12	17	0	0	29	994
5:00 PM	2	121	0	0	123	130	3	0	0	133	3	6	0	0	9	265
5:15 PM	6	115	0	0	121	116	4	0	0	120	12	6	0	0	18	259
5:30 PM	1	120	0	0	121	106	3	0	0	109	5	14	0	0	19	249
5:45 PM	5	127	0	0	132	96	1	0	0	97	2	5	0	0	7	236
Hourly Total	14	483	0	0	497	448	11	0	0	459	22	31	0	0	53	1009
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	125	2122	0	0	2247	2213	107	0	6	2320	125	162	0	0	287	4854
Approach %	5.6	94.4	0.0	-	-	95.4	4.6	0.0	-	-	43.6	56.4	0.0	-	-	-
Total %	2.6	43.7	0.0	-	46.3	45.6	2.2	0.0	-	47.8	2.6	3.3	0.0	-	5.9	-
Lights	102	2071	0	-	2173	2149	93	0	-	2242	124	161	0	-	285	4700
% Lights	81.6	97.6	-	-	96.7	97.1	86.9	-	-	96.6	99.2	99.4	-	-	99.3	96.8
Buses	23	20	0	-	43	16	11	0	-	27	1	1	0	-	2	72
% Buses	18.4	0.9	-	-	1.9	0.7	10.3	-	-	1.2	0.8	0.6	-	-	0.7	1.5
Trucks	0	31	0	-	31	48	3	0	-	51	0	0	0	-	0	82
% Trucks	0.0	1.5	-	-	1.4	2.2	2.8	-	-	2.2	0.0	0.0	-	-	0.0	1.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

Morgantown, WV
Greenbag Rd & Richard Ave
Tuesday, October 2, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

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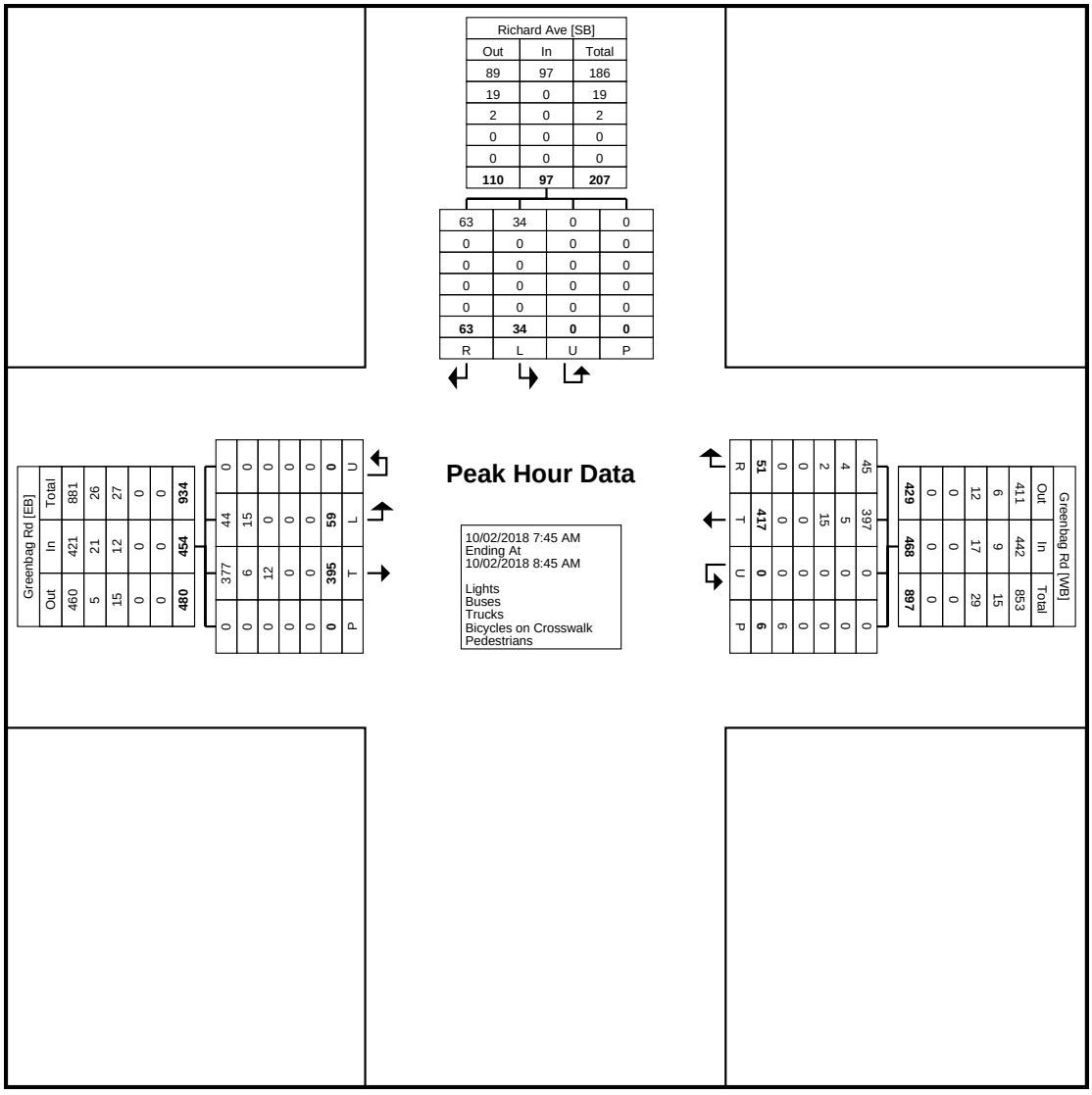
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Morgantown, WV
Greenbag Rd & Richard Ave
Tuesday, October 2, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Richard Ave Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	12	135	0	0	147	128	18	0	0	146	0	3	0	0	3	296
8:00 AM	13	110	0	0	123	100	17	0	0	117	1	2	0	0	3	243
8:15 AM	18	68	0	0	86	99	8	0	0	107	4	14	0	0	18	211
8:30 AM	16	82	0	0	98	90	8	0	6	98	29	44	0	0	73	269
Total	59	395	0	0	454	417	51	0	6	468	34	63	0	0	97	1019
Approach %	13.0	87.0	0.0	-	-	89.1	10.9	0.0	-	-	35.1	64.9	0.0	-	-	-
Total %	5.8	38.8	0.0	-	44.6	40.9	5.0	0.0	-	45.9	3.3	6.2	0.0	-	9.5	-
PHF	0.819	0.731	0.000	-	0.772	0.814	0.708	0.000	-	0.801	0.293	0.358	0.000	-	0.332	0.861
Lights	44	377	0	-	421	397	45	0	-	442	34	63	0	-	97	960
% Lights	74.6	95.4	-	-	92.7	95.2	88.2	-	-	94.4	100.0	100.0	-	-	100.0	94.2
Buses	15	6	0	-	21	5	4	0	-	9	0	0	0	-	0	30
% Buses	25.4	1.5	-	-	4.6	1.2	7.8	-	-	1.9	0.0	0.0	-	-	0.0	2.9
Trucks	0	12	0	-	12	15	2	0	-	17	0	0	0	-	0	29
% Trucks	0.0	3.0	-	-	2.6	3.6	3.9	-	-	3.6	0.0	0.0	-	-	0.0	2.8
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (7:45 AM)

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Morgantown, WV
Greenbag Rd & Richard Ave
Tuesday, October 2, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (4:30 PM)

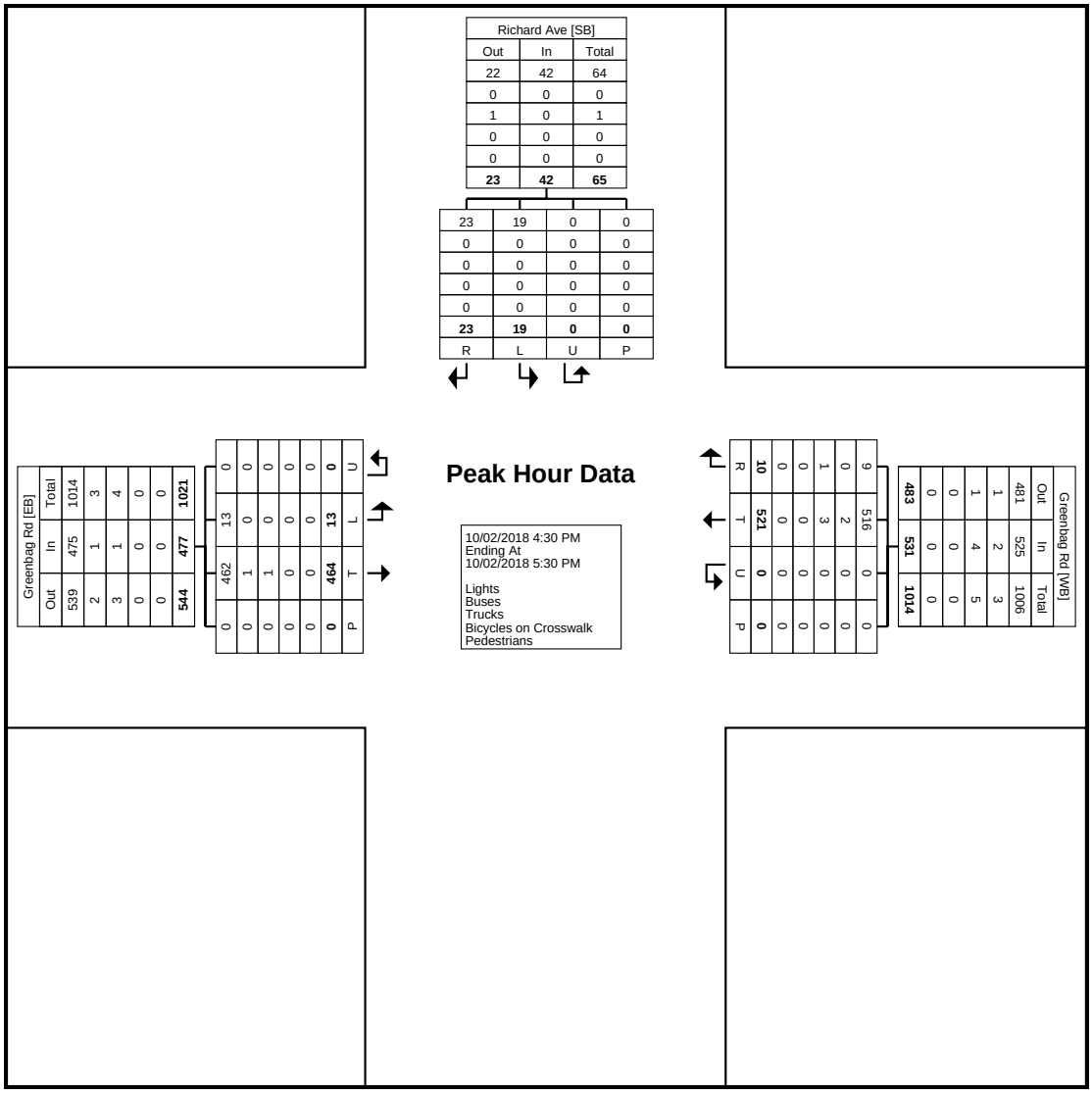
Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Richard Ave Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	2	116	0	0	118	140	2	0	0	142	1	6	0	0	7	267
4:45 PM	3	112	0	0	115	135	1	0	0	136	3	5	0	0	8	259
5:00 PM	2	121	0	0	123	130	3	0	0	133	3	6	0	0	9	265
5:15 PM	6	115	0	0	121	116	4	0	0	120	12	6	0	0	18	259
Total	13	464	0	0	477	521	10	0	0	531	19	23	0	0	42	1050
Approach %	2.7	97.3	0.0	-	-	98.1	1.9	0.0	-	-	45.2	54.8	0.0	-	-	-
Total %	1.2	44.2	0.0	-	45.4	49.6	1.0	0.0	-	50.6	1.8	2.2	0.0	-	4.0	-
PHF	0.542	0.959	0.000	-	0.970	0.930	0.625	0.000	-	0.935	0.396	0.958	0.000	-	0.583	0.983
Lights	13	462	0	-	475	516	9	0	-	525	19	23	0	-	42	1042
% Lights	100.0	99.6	-	-	99.6	99.0	90.0	-	-	98.9	100.0	100.0	-	-	100.0	99.2
Buses	0	1	0	-	1	2	0	0	-	2	0	0	0	-	0	3
% Buses	0.0	0.2	-	-	0.2	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.3
Trucks	0	1	0	-	1	3	1	0	-	4	0	0	0	-	0	5
% Trucks	0.0	0.2	-	-	0.2	0.6	10.0	-	-	0.8	0.0	0.0	-	-	0.0	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Richard Ave
Tuesday, October 2, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard
Site Code:
Start Date: 10/02/2018



Turning Movement Peak Hour Data Plot (4:30 PM)

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Morgantown, WV
Greenbag Rd & Richard Ave
Saturday, September 29, 2018
Location: 39.609916, -79.941852

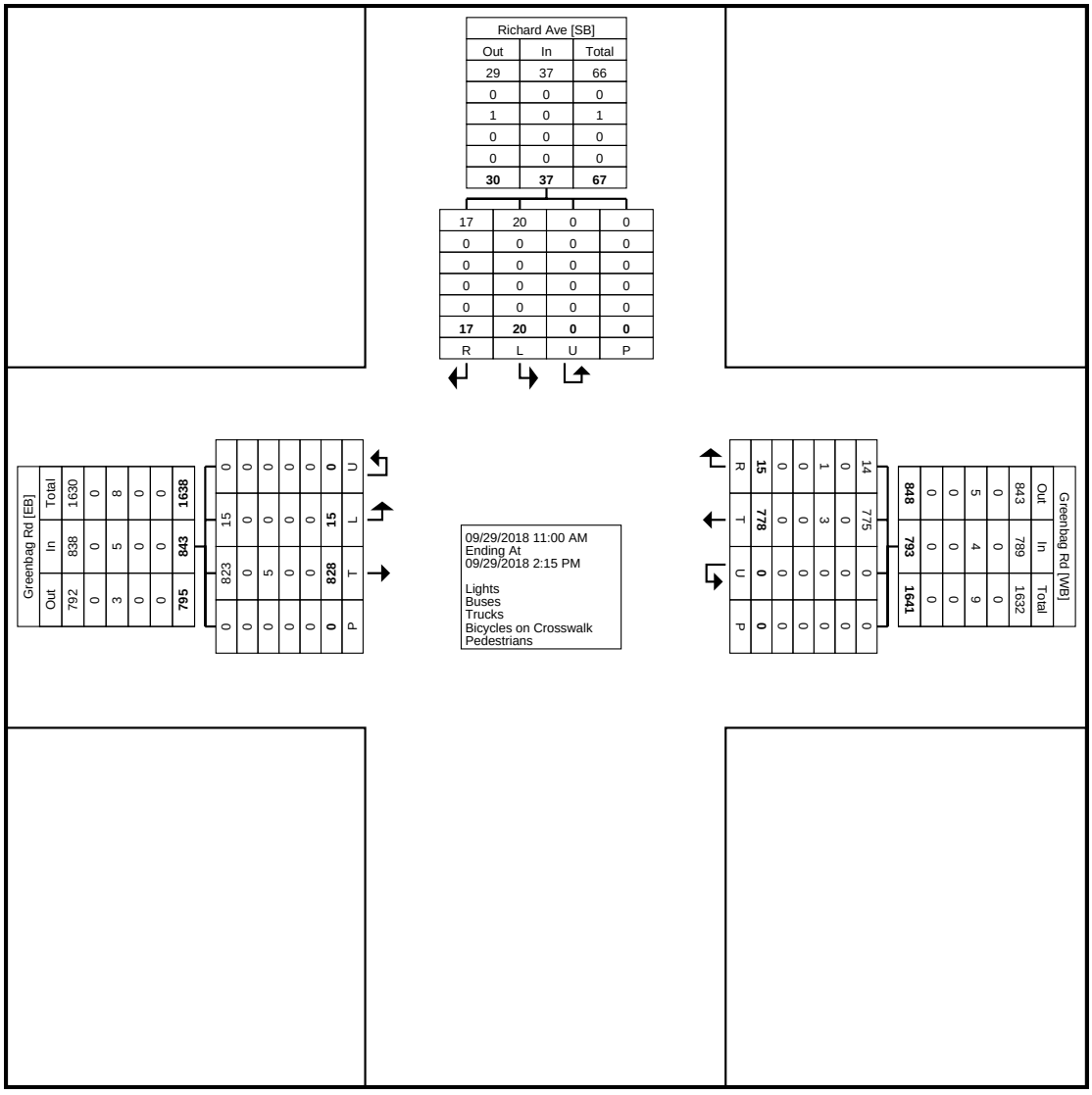
Count Name: greenbag richard Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Richard Ave Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	1	77	0	0	78	72	1	0	0	73	0	1	0	0	1	152
11:15 AM	0	59	0	0	59	81	4	0	0	85	3	3	0	0	6	150
11:30 AM	4	96	0	0	100	63	2	0	0	65	3	1	0	0	4	169
11:45 AM	2	95	0	0	97	74	3	0	0	77	1	2	0	0	3	177
Hourly Total	7	327	0	0	334	290	10	0	0	300	7	7	0	0	14	648
12:00 PM	0	73	0	0	73	72	1	0	0	73	0	2	0	0	2	148
12:15 PM	4	74	0	0	78	47	1	0	0	48	5	3	0	0	8	134
12:30 PM	0	65	0	0	65	64	1	0	0	65	0	0	0	0	0	130
12:45 PM	0	66	0	0	66	61	0	0	0	61	0	1	0	0	1	128
Hourly Total	4	278	0	0	282	244	3	0	0	247	5	6	0	0	11	540
1:00 PM	0	51	0	0	51	64	0	0	0	64	1	0	0	0	1	116
1:15 PM	0	59	0	0	59	61	1	0	0	62	2	0	0	0	2	123
1:30 PM	2	55	0	0	57	59	1	0	0	60	4	1	0	0	5	122
1:45 PM	2	58	0	0	60	60	0	0	0	60	1	3	0	0	4	124
Hourly Total	4	223	0	0	227	244	2	0	0	246	8	4	0	0	12	485
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	15	828	0	0	843	778	15	0	0	793	20	17	0	0	37	1673
Approach %	1.8	98.2	0.0	-	-	98.1	1.9	0.0	-	-	54.1	45.9	0.0	-	-	-
Total %	0.9	49.5	0.0	-	50.4	46.5	0.9	0.0	-	47.4	1.2	1.0	0.0	-	2.2	-
Lights	15	823	0	-	838	775	14	0	-	789	20	17	0	-	37	1664
% Lights	100.0	99.4	-	-	99.4	99.6	93.3	-	-	99.5	100.0	100.0	-	-	100.0	99.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	5	0	-	5	3	1	0	-	4	0	0	0	-	0	9
% Trucks	0.0	0.6	-	-	0.6	0.4	6.7	-	-	0.5	0.0	0.0	-	-	0.0	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Morgantown, WV
Greenbag Rd & Richard Ave
Saturday, September 29, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard Sat
Site Code:
Start Date: 09/29/2018



Turning Movement Data Plot

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Morgantown, WV
Greenbag Rd & Richard Ave
Saturday, September 29, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Peak Hour Data (11:00 AM)

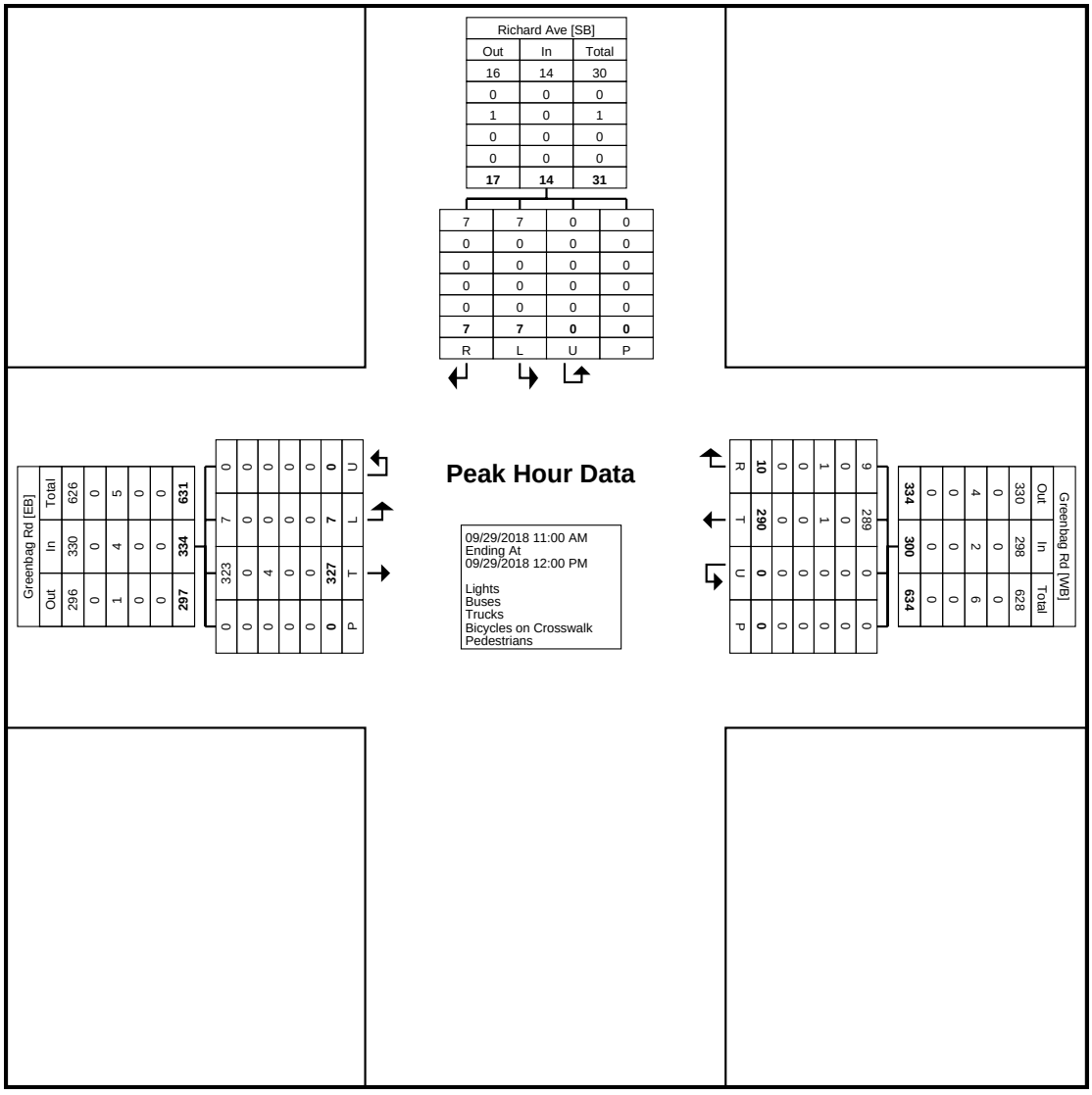
Start Time	Greenbag Rd Eastbound					Greenbag Rd Westbound					Richard Ave Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	1	77	0	0	78	72	1	0	0	73	0	1	0	0	1	152
11:15 AM	0	59	0	0	59	81	4	0	0	85	3	3	0	0	6	150
11:30 AM	4	96	0	0	100	63	2	0	0	65	3	1	0	0	4	169
11:45 AM	2	95	0	0	97	74	3	0	0	77	1	2	0	0	3	177
Total	7	327	0	0	334	290	10	0	0	300	7	7	0	0	14	648
Approach %	2.1	97.9	0.0	-	-	96.7	3.3	0.0	-	-	50.0	50.0	0.0	-	-	-
Total %	1.1	50.5	0.0	-	51.5	44.8	1.5	0.0	-	46.3	1.1	1.1	0.0	-	2.2	-
PHF	0.438	0.852	0.000	-	0.835	0.895	0.625	0.000	-	0.882	0.583	0.583	0.000	-	0.583	0.915
Lights	7	323	0	-	330	289	9	0	-	298	7	7	0	-	14	642
% Lights	100.0	98.8	-	-	98.8	99.7	90.0	-	-	99.3	100.0	100.0	-	-	100.0	99.1
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	4	0	-	4	1	1	0	-	2	0	0	0	-	0	6
% Trucks	0.0	1.2	-	-	1.2	0.3	10.0	-	-	0.7	0.0	0.0	-	-	0.0	0.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Richard Ave
Saturday, September 29, 2018
Location: 39.609916, -79.941852

Count Name: greenbag richard Sat
Site Code:
Start Date: 09/29/2018



Turning Movement Peak Hour Data Plot (11:00 AM)

Morgantown, PA
Greenbag Rd & Lower Aarons Creek Rd
Tuesday, October 2, 2018
Location: 39.612236, -79.932148

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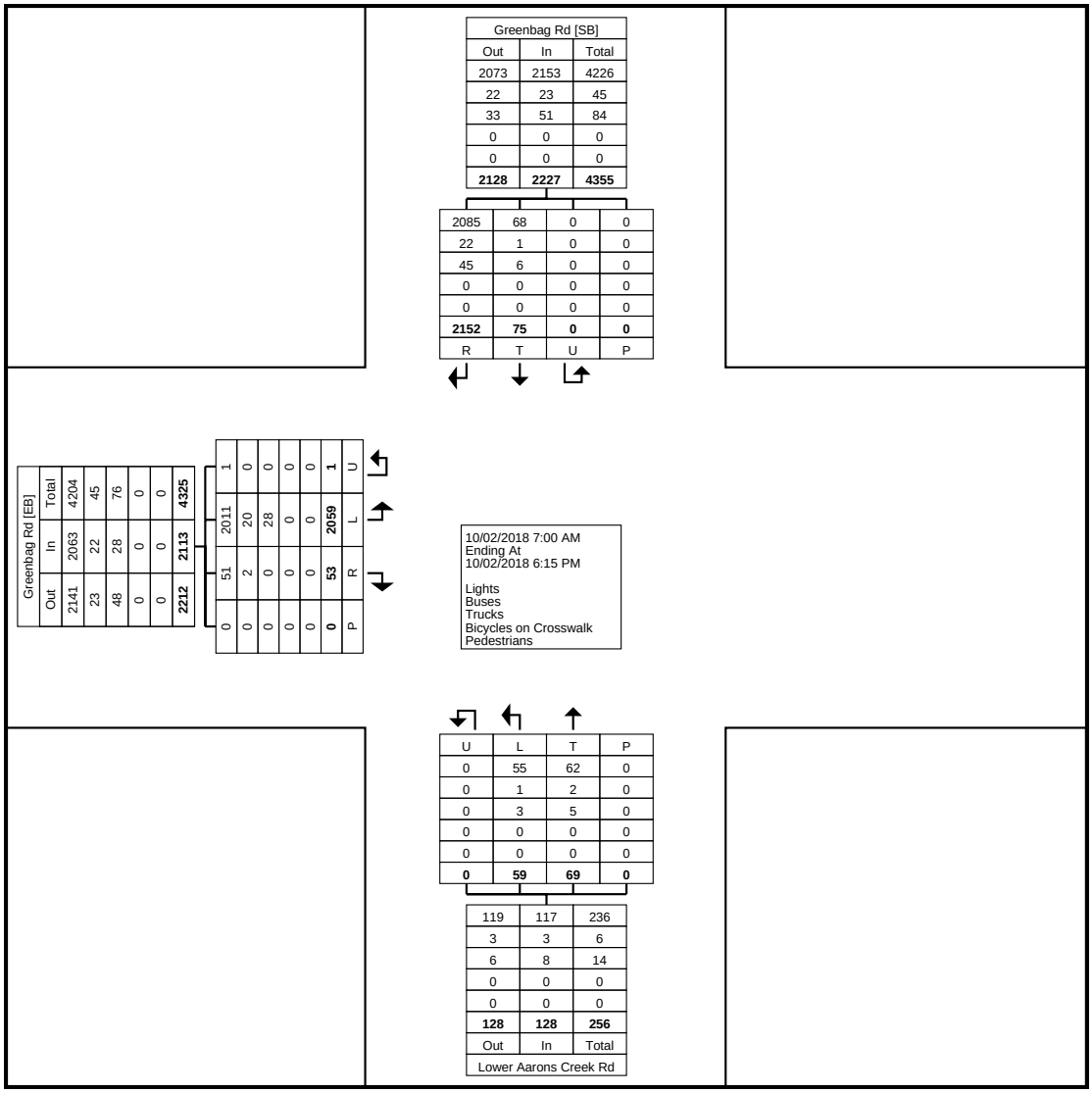
Count Name: Greenbag & Lower Aaron Cr
Site Code:
Start Date: 10/02/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound					Lower Aarons Creek Rd Northbound					Greenbag Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	78	2	0	0	80	4	2	0	0	6	1	102	0	0	103	189
7:15 AM	127	0	0	0	127	6	4	0	0	10	0	66	0	0	66	203
7:30 AM	94	1	0	0	95	4	7	0	0	11	1	98	0	0	99	205
7:45 AM	116	0	0	0	116	6	3	0	0	9	3	145	0	0	148	273
Hourly Total	415	3	0	0	418	20	16	0	0	36	5	411	0	0	416	870
8:00 AM	107	2	0	0	109	1	2	0	0	3	0	90	0	0	90	202
8:15 AM	70	0	0	0	70	2	6	0	0	8	2	86	0	0	88	166
8:30 AM	103	3	0	0	106	3	9	0	0	12	2	93	0	0	95	213
8:45 AM	73	1	0	0	74	0	5	0	0	5	1	80	0	0	81	160
Hourly Total	353	6	0	0	359	6	22	0	0	28	5	349	0	0	354	741
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	80	2	0	0	82	4	6	0	0	10	5	116	0	0	121	213
3:15 PM	96	2	0	0	98	4	1	0	0	5	7	129	0	0	136	239
3:30 PM	134	3	1	0	138	0	3	0	0	3	7	120	0	0	127	268
3:45 PM	112	1	0	0	113	1	2	0	0	3	9	114	0	0	123	239
Hourly Total	422	8	1	0	431	9	12	0	0	21	28	479	0	0	507	959
4:00 PM	129	3	0	0	132	3	6	0	0	9	8	114	0	0	122	263
4:15 PM	99	2	0	0	101	4	2	0	0	6	5	103	0	0	108	215
4:30 PM	99	6	0	0	105	5	1	0	0	6	5	123	0	0	128	239
4:45 PM	107	5	0	0	112	3	0	0	0	3	6	136	0	0	142	257
Hourly Total	434	16	0	0	450	15	9	0	0	24	24	476	0	0	500	974
5:00 PM	113	6	0	0	119	2	0	0	0	2	6	115	0	0	121	242
5:15 PM	118	6	0	0	124	3	6	0	0	9	2	120	0	0	122	255
5:30 PM	106	4	0	0	110	2	2	0	0	4	3	98	0	0	101	215
5:45 PM	98	4	0	0	102	2	2	0	0	4	2	104	0	0	106	212
Hourly Total	435	20	0	0	455	9	10	0	0	19	13	437	0	0	450	924
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2059	53	1	0	2113	59	69	0	0	128	75	2152	0	0	2227	4468
Approach %	97.4	2.5	0.0	-	-	46.1	53.9	0.0	-	-	3.4	96.6	0.0	-	-	-
Total %	46.1	1.2	0.0	-	47.3	1.3	1.5	0.0	-	2.9	1.7	48.2	0.0	-	49.8	-
Lights	2011	51	1	-	2063	55	62	0	-	117	68	2085	0	-	2153	4333
% Lights	97.7	96.2	100.0	-	97.6	93.2	89.9	-	-	91.4	90.7	96.9	-	-	96.7	97.0
Buses	20	2	0	-	22	1	2	0	-	3	1	22	0	-	23	48
% Buses	1.0	3.8	0.0	-	1.0	1.7	2.9	-	-	2.3	1.3	1.0	-	-	1.0	1.1
Trucks	28	0	0	-	28	3	5	0	-	8	6	45	0	-	51	87
% Trucks	1.4	0.0	0.0	-	1.3	5.1	7.2	-	-	6.3	8.0	2.1	-	-	2.3	1.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, PA
Greenbag Rd & Lower Aarons Creek Rd
Tuesday, October 2, 2018
Location: 39.612236, -79.932148

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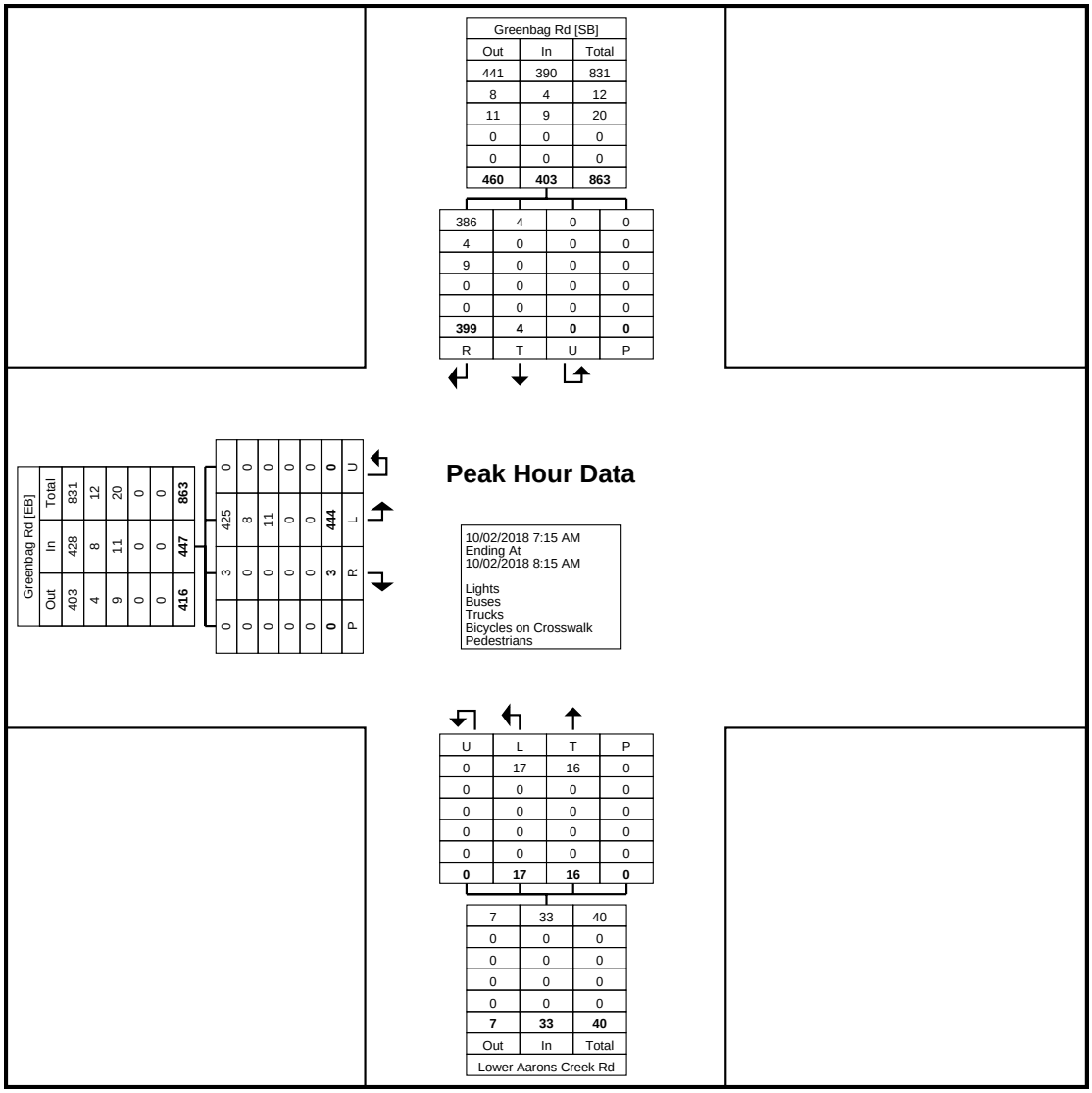
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Turning Movement Peak Hour Data (7:15 AM)

Start Time	Greenbag Rd Eastbound					Lower Aarons Creek Rd Northbound					Greenbag Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	127	0	0	0	127	6	4	0	0	10	0	66	0	0	66	203
7:30 AM	94	1	0	0	95	4	7	0	0	11	1	98	0	0	99	205
7:45 AM	116	0	0	0	116	6	3	0	0	9	3	145	0	0	148	273
8:00 AM	107	2	0	0	109	1	2	0	0	3	0	90	0	0	90	202
Total	444	3	0	0	447	17	16	0	0	33	4	399	0	0	403	883
Approach %	99.3	0.7	0.0	-	-	51.5	48.5	0.0	-	-	1.0	99.0	0.0	-	-	-
Total %	50.3	0.3	0.0	-	50.6	1.9	1.8	0.0	-	3.7	0.5	45.2	0.0	-	45.6	-
PHF	0.874	0.375	0.000	-	0.880	0.708	0.571	0.000	-	0.750	0.333	0.688	0.000	-	0.681	0.809
Lights	425	3	0	-	428	17	16	0	-	33	4	386	0	-	390	851
% Lights	95.7	100.0	-	-	95.7	100.0	100.0	-	-	100.0	100.0	96.7	-	-	96.8	96.4
Buses	8	0	0	-	8	0	0	0	-	0	0	4	0	-	4	12
% Buses	1.8	0.0	-	-	1.8	0.0	0.0	-	-	0.0	0.0	1.0	-	-	1.0	1.4
Trucks	11	0	0	-	11	0	0	0	-	0	0	9	0	-	9	20
% Trucks	2.5	0.0	-	-	2.5	0.0	0.0	-	-	0.0	0.0	2.3	-	-	2.2	2.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Turning Movement Peak Hour Data Plot (7:15 AM)

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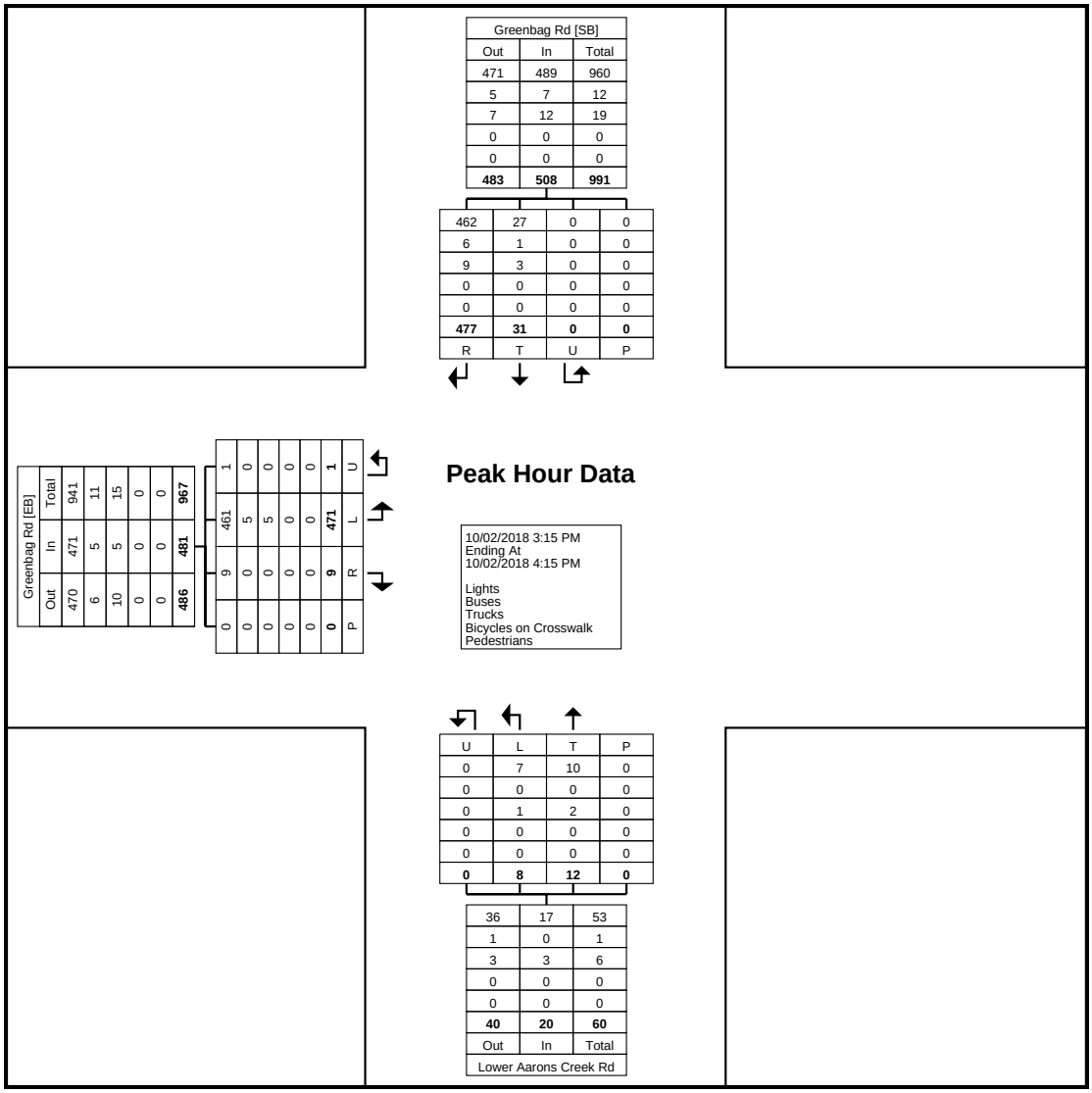
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Turning Movement Peak Hour Data (3:15 PM)

Start Time	Greenbag Rd Eastbound					Lower Aarons Creek Rd Northbound					Greenbag Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
3:15 PM	96	2	0	0	98	4	1	0	0	5	7	129	0	0	136	239
3:30 PM	134	3	1	0	138	0	3	0	0	3	7	120	0	0	127	268
3:45 PM	112	1	0	0	113	1	2	0	0	3	9	114	0	0	123	239
4:00 PM	129	3	0	0	132	3	6	0	0	9	8	114	0	0	122	263
Total	471	9	1	0	481	8	12	0	0	20	31	477	0	0	508	1009
Approach %	97.9	1.9	0.2	-	-	40.0	60.0	0.0	-	-	6.1	93.9	0.0	-	-	-
Total %	46.7	0.9	0.1	-	47.7	0.8	1.2	0.0	-	2.0	3.1	47.3	0.0	-	50.3	-
PHF	0.879	0.750	0.250	-	0.871	0.500	0.500	0.000	-	0.556	0.861	0.924	0.000	-	0.934	0.941
Lights	461	9	1	-	471	7	10	0	-	17	27	462	0	-	489	977
% Lights	97.9	100.0	100.0	-	97.9	87.5	83.3	-	-	85.0	87.1	96.9	-	-	96.3	96.8
Buses	5	0	0	-	5	0	0	0	-	0	1	6	0	-	7	12
% Buses	1.1	0.0	0.0	-	1.0	0.0	0.0	-	-	0.0	3.2	1.3	-	-	1.4	1.2
Trucks	5	0	0	-	5	1	2	0	-	3	3	9	0	-	12	20
% Trucks	1.1	0.0	0.0	-	1.0	12.5	16.7	-	-	15.0	9.7	1.9	-	-	2.4	2.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Turning Movement Peak Hour Data Plot (3:15 PM)

Morgantown, WV
Greenbag Rd & Lower Aarons Creek Rd
Saturday, September 29, 2018
Location: 39.612236, -79.932148

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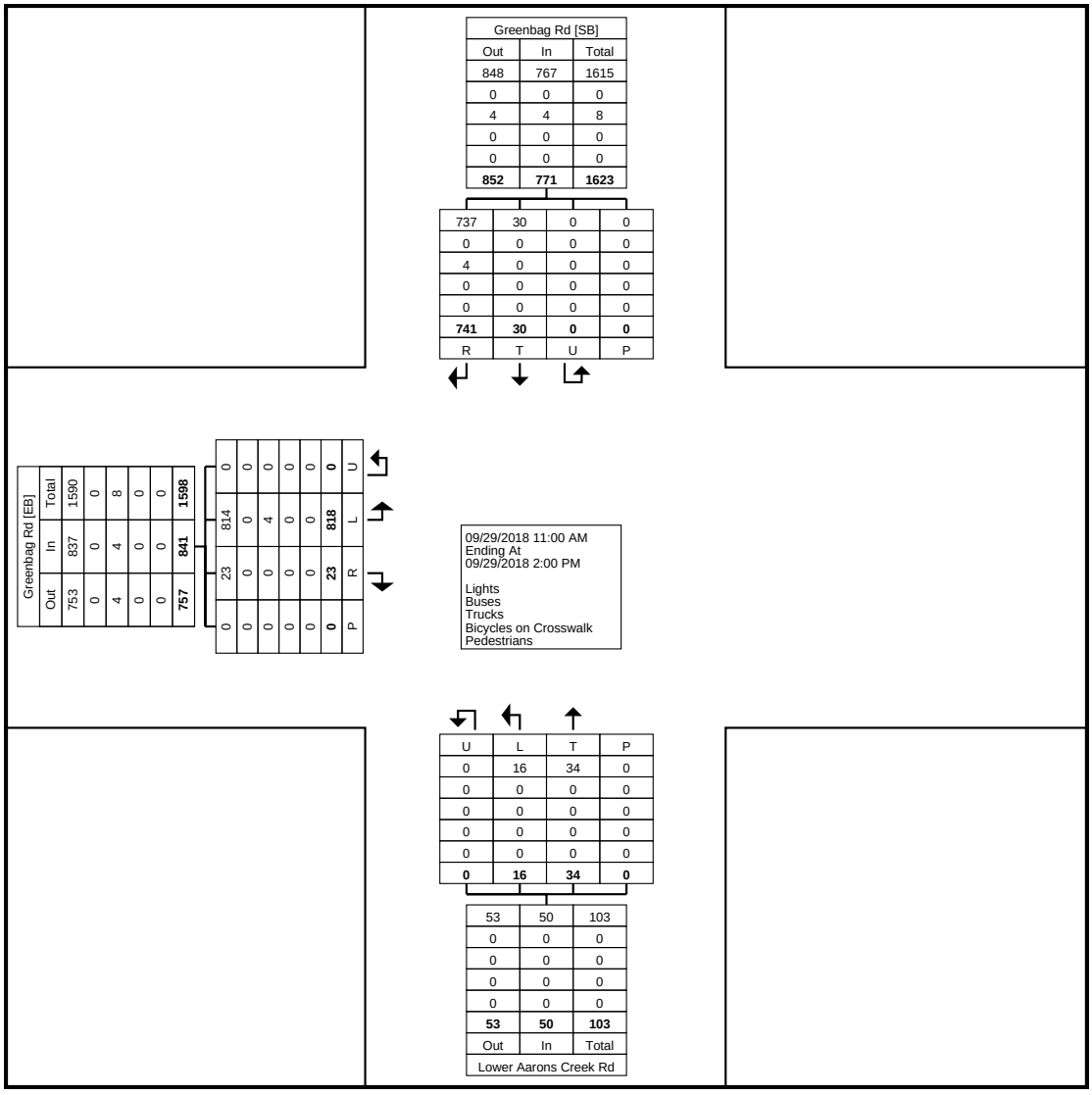
Count Name: Greenbag Rd & Lower Aarons Creek Sat
Site Code:
Start Date: 09/29/2018

Turning Movement Data

Start Time	Greenbag Rd Eastbound					Lower Aarons Creek Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	67	2	0	0	69	1	6	0	0	7	2	67	0	0	69	145
11:15 AM	79	0	0	0	79	1	2	0	0	3	3	76	0	0	79	161
11:30 AM	90	0	0	0	90	1	7	0	0	8	3	60	0	0	63	161
11:45 AM	91	2	0	0	93	0	2	0	0	2	0	79	0	0	79	174
Hourly Total	327	4	0	0	331	3	17	0	0	20	8	282	0	0	290	641
12:00 PM	69	4	0	0	73	5	4	0	0	9	4	59	0	0	63	145
12:15 PM	75	1	0	0	76	1	2	0	0	3	1	49	0	0	50	129
12:30 PM	60	3	0	0	63	1	4	0	0	5	6	61	0	0	67	135
12:45 PM	61	4	0	0	65	1	0	0	0	1	0	51	0	0	51	117
Hourly Total	265	12	0	0	277	8	10	0	0	18	11	220	0	0	231	526
1:00 PM	49	0	0	0	49	1	1	0	0	2	3	67	0	0	70	121
1:15 PM	57	3	0	0	60	2	1	0	0	3	5	58	0	0	63	126
1:30 PM	61	1	0	0	62	2	4	0	0	6	1	60	0	0	61	129
1:45 PM	59	3	0	0	62	0	1	0	0	1	2	54	0	0	56	119
Hourly Total	226	7	0	0	233	5	7	0	0	12	11	239	0	0	250	495
Grand Total	818	23	0	0	841	16	34	0	0	50	30	741	0	0	771	1662
Approach %	97.3	2.7	0.0	-	-	32.0	68.0	0.0	-	-	3.9	96.1	0.0	-	-	-
Total %	49.2	1.4	0.0	-	50.6	1.0	2.0	0.0	-	3.0	1.8	44.6	0.0	-	46.4	-
Lights	814	23	0	-	837	16	34	0	-	50	30	737	0	-	767	1654
% Lights	99.5	100.0	-	-	99.5	100.0	100.0	-	-	100.0	100.0	99.5	-	-	99.5	99.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	4	0	0	-	4	0	0	0	-	0	0	4	0	-	4	8
% Trucks	0.5	0.0	-	-	0.5	0.0	0.0	-	-	0.0	0.0	0.5	-	-	0.5	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Turning Movement Data Plot

Morgantown, WV
Greenbag Rd & Lower Aarons Creek Rd
Saturday, September 29, 2018
Location: 39.612236, -79.932148

www.TSTData.com
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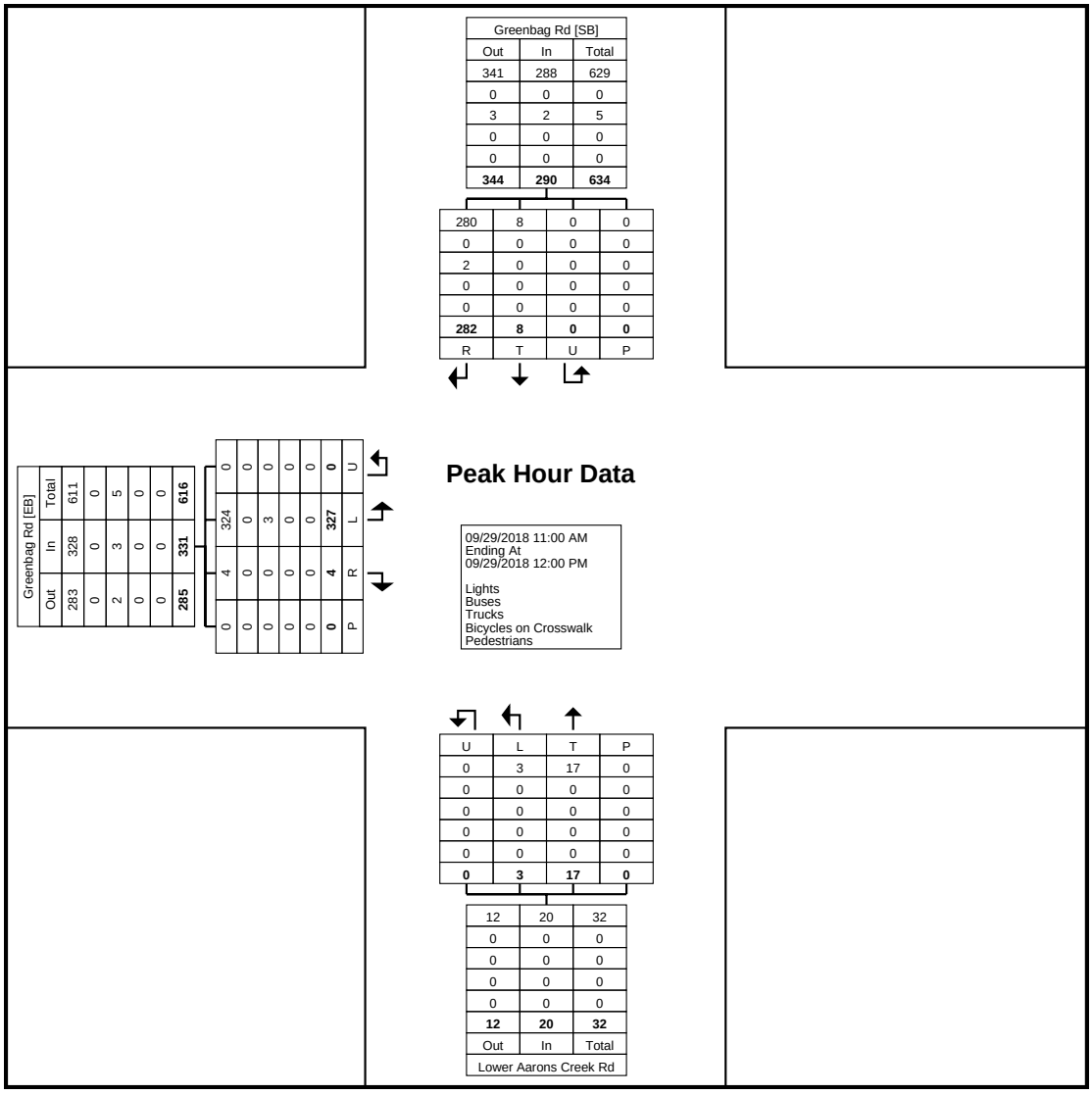
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Turning Movement Peak Hour Data (11:00 AM)

Start Time	Greenbag Rd Eastbound					Lower Aarons Creek Rd Northbound					Greenbag Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
11:00 AM	67	2	0	0	69	1	6	0	0	7	2	67	0	0	69	145
11:15 AM	79	0	0	0	79	1	2	0	0	3	3	76	0	0	79	161
11:30 AM	90	0	0	0	90	1	7	0	0	8	3	60	0	0	63	161
11:45 AM	91	2	0	0	93	0	2	0	0	2	0	79	0	0	79	174
Total	327	4	0	0	331	3	17	0	0	20	8	282	0	0	290	641
Approach %	98.8	1.2	0.0	-	-	15.0	85.0	0.0	-	-	2.8	97.2	0.0	-	-	-
Total %	51.0	0.6	0.0	-	51.6	0.5	2.7	0.0	-	3.1	1.2	44.0	0.0	-	45.2	-
PHF	0.898	0.500	0.000	-	0.890	0.750	0.607	0.000	-	0.625	0.667	0.892	0.000	-	0.918	0.921
Lights	324	4	0	-	328	3	17	0	-	20	8	280	0	-	288	636
% Lights	99.1	100.0	-	-	99.1	100.0	100.0	-	-	100.0	100.0	99.3	-	-	99.3	99.2
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	3	0	0	-	3	0	0	0	-	0	0	2	0	-	2	5
% Trucks	0.9	0.0	-	-	0.9	0.0	0.0	-	-	0.0	0.0	0.7	-	-	0.7	0.8
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Turning Movement Peak Hour Data Plot (11:00 AM)

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Morgantown, WV
Greenbag Rd & Diamond Ave
Tuesday, October 2, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 10/02/2018

Turning Movement Data

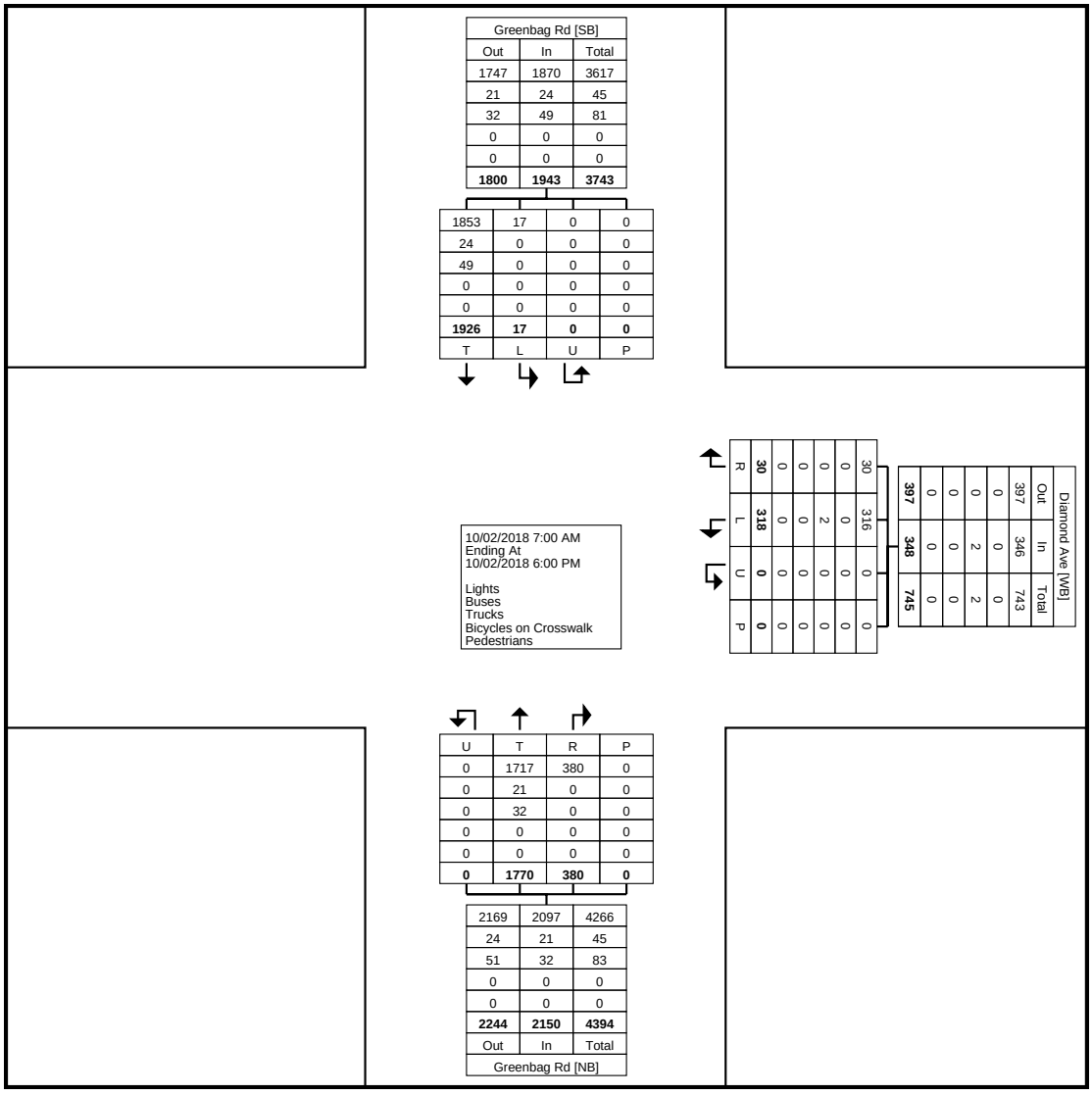
Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	28	1	0	0	29	55	13	0	0	68	0	80	0	0	80	177
7:15 AM	12	0	0	0	12	116	19	0	0	135	1	51	0	0	52	199
7:30 AM	19	0	0	0	19	89	13	0	0	102	0	78	0	0	78	199
7:45 AM	26	0	0	0	26	99	12	0	0	111	0	111	0	0	111	248
Hourly Total	85	1	0	0	86	359	57	0	0	416	1	320	0	0	321	823
8:00 AM	19	5	0	0	24	98	16	0	0	114	0	90	0	0	90	228
8:15 AM	6	0	0	0	6	76	5	0	0	81	0	79	0	0	79	166
8:30 AM	17	1	0	0	18	81	18	0	0	99	0	79	0	0	79	196
8:45 AM	15	1	0	0	16	78	11	0	0	89	1	73	0	0	74	179
Hourly Total	57	7	0	0	64	333	50	0	0	383	1	321	0	0	322	769
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	16	3	0	0	19	72	16	0	0	88	1	102	0	0	103	210
3:15 PM	15	1	0	0	16	73	21	0	0	94	1	116	0	0	117	227
3:30 PM	19	0	0	0	19	92	33	0	0	125	1	116	0	0	117	261
3:45 PM	21	2	0	0	23	101	28	0	0	129	1	102	0	0	103	255
Hourly Total	71	6	0	0	77	338	98	0	0	436	4	436	0	0	440	953
4:00 PM	10	1	0	0	11	105	31	0	0	136	2	105	0	0	107	254
4:15 PM	16	1	0	0	17	97	20	0	0	117	0	92	0	0	92	226
4:30 PM	10	2	0	0	12	80	19	0	0	99	2	111	0	0	113	224
4:45 PM	18	4	0	0	22	82	22	0	0	104	1	119	0	0	120	246
Hourly Total	54	8	0	0	62	364	92	0	0	456	5	427	0	0	432	950
5:00 PM	11	1	0	0	12	92	29	0	0	121	1	118	0	0	119	252
5:15 PM	9	3	0	0	12	93	26	0	0	119	4	117	0	0	121	252
5:30 PM	14	3	0	0	17	105	9	0	0	114	0	93	0	0	93	224
5:45 PM	17	1	0	0	18	86	19	0	0	105	1	94	0	0	95	218
Hourly Total	51	8	0	0	59	376	83	0	0	459	6	422	0	0	428	946
Grand Total	318	30	0	0	348	1770	380	0	0	2150	17	1926	0	0	1943	4441
Approach %	91.4	8.6	0.0	-	-	82.3	17.7	0.0	-	-	0.9	99.1	0.0	-	-	-
Total %	7.2	0.7	0.0	-	7.8	39.9	8.6	0.0	-	48.4	0.4	43.4	0.0	-	43.8	-
Lights	316	30	0	-	346	1717	380	0	-	2097	17	1853	0	-	1870	4313
% Lights	99.4	100.0	-	-	99.4	97.0	100.0	-	-	97.5	100.0	96.2	-	-	96.2	97.1
Buses	0	0	0	-	0	21	0	0	-	21	0	24	0	-	24	45
% Buses	0.0	0.0	-	-	0.0	1.2	0.0	-	-	1.0	0.0	1.2	-	-	1.2	1.0
Trucks	2	0	0	-	2	32	0	0	-	32	0	49	0	-	49	83
% Trucks	0.6	0.0	-	-	0.6	1.8	0.0	-	-	1.5	0.0	2.5	-	-	2.5	1.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Diamond Ave
Tuesday, October 2, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

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184 Baker Rd

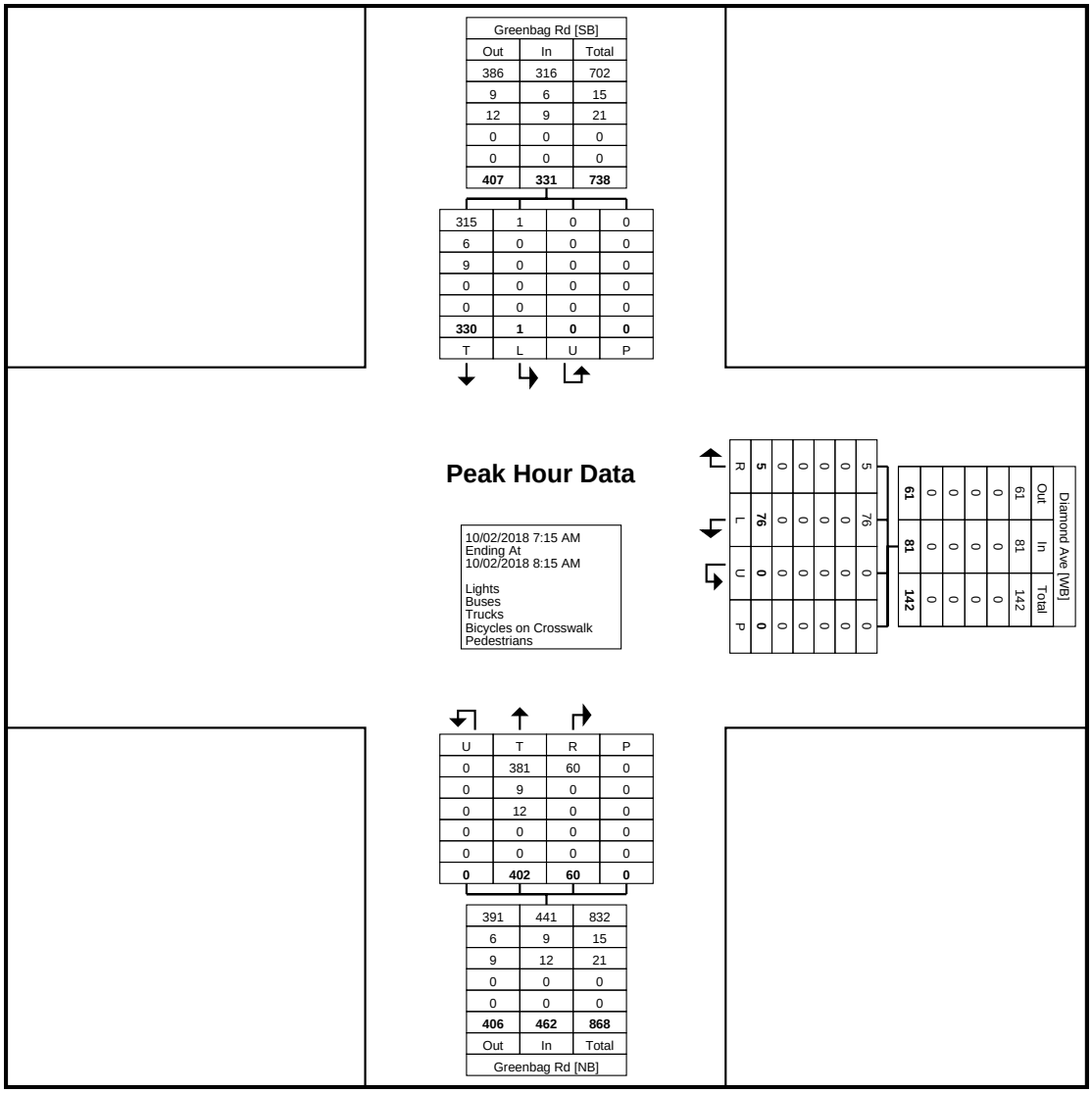
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Greenbag Rd & Diamond Ave
Tuesday, October 2, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:15 AM	12	0	0	0	12	116	19	0	0	135	1	51	0	0	52	199
7:30 AM	19	0	0	0	19	89	13	0	0	102	0	78	0	0	78	199
7:45 AM	26	0	0	0	26	99	12	0	0	111	0	111	0	0	111	248
8:00 AM	19	5	0	0	24	98	16	0	0	114	0	90	0	0	90	228
Total	76	5	0	0	81	402	60	0	0	462	1	330	0	0	331	874
Approach %	93.8	6.2	0.0	-	-	87.0	13.0	0.0	-	-	0.3	99.7	0.0	-	-	-
Total %	8.7	0.6	0.0	-	9.3	46.0	6.9	0.0	-	52.9	0.1	37.8	0.0	-	37.9	-
PHF	0.731	0.250	0.000	-	0.779	0.866	0.789	0.000	-	0.856	0.250	0.743	0.000	-	0.745	0.881
Lights	76	5	0	-	81	381	60	0	-	441	1	315	0	-	316	838
% Lights	100.0	100.0	-	-	100.0	94.8	100.0	-	-	95.5	100.0	95.5	-	-	95.5	95.9
Buses	0	0	0	-	0	9	0	0	-	9	0	6	0	-	6	15
% Buses	0.0	0.0	-	-	0.0	2.2	0.0	-	-	1.9	0.0	1.8	-	-	1.8	1.7
Trucks	0	0	0	-	0	12	0	0	-	12	0	9	0	-	9	21
% Trucks	0.0	0.0	-	-	0.0	3.0	0.0	-	-	2.6	0.0	2.7	-	-	2.7	2.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (7:15 AM)

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Morgantown, WV
Greenbag Rd & Diamond Ave
Tuesday, October 2, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (3:15 PM)

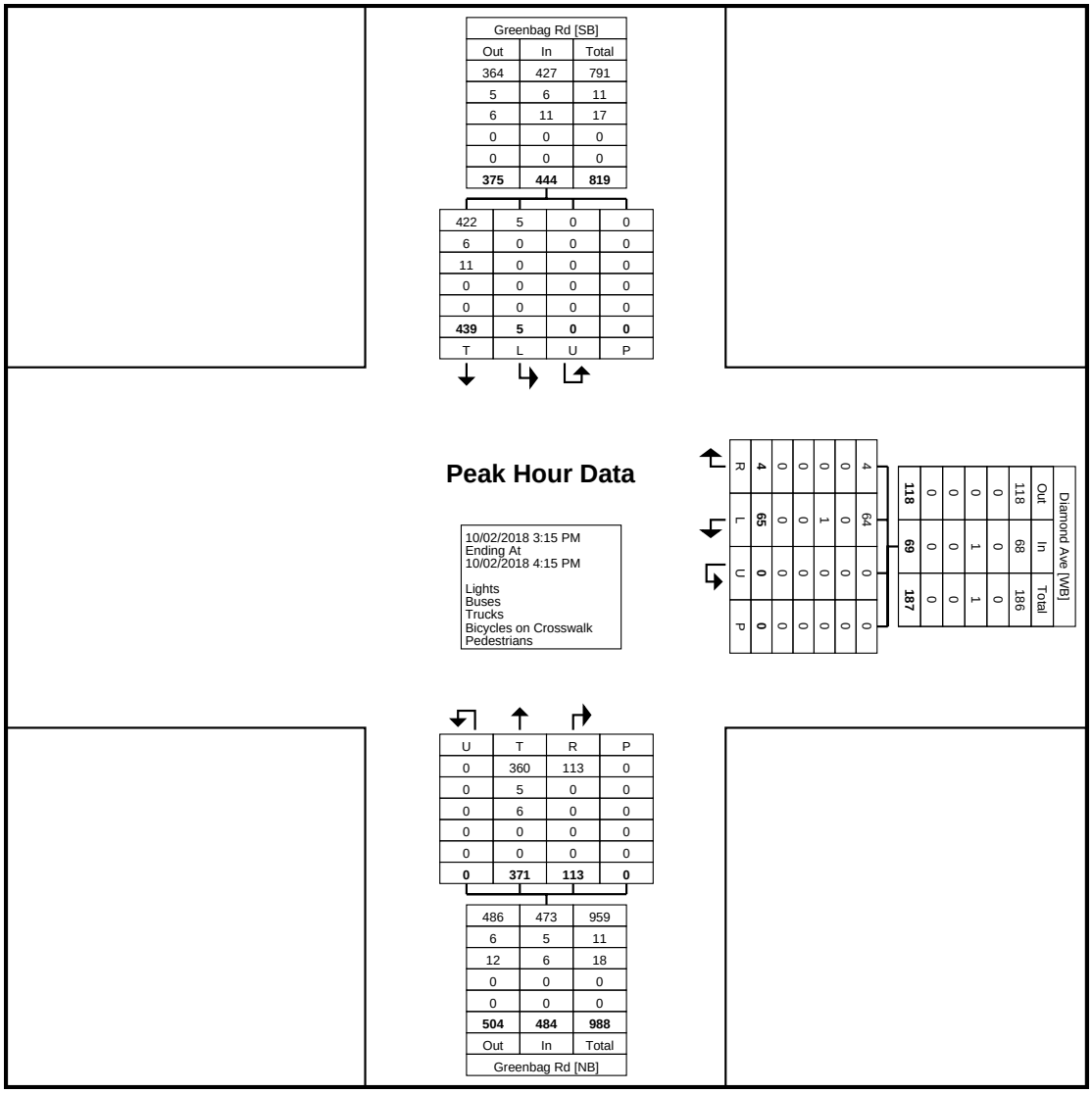
Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
3:15 PM	15	1	0	0	16	73	21	0	0	94	1	116	0	0	117	227
3:30 PM	19	0	0	0	19	92	33	0	0	125	1	116	0	0	117	261
3:45 PM	21	2	0	0	23	101	28	0	0	129	1	102	0	0	103	255
4:00 PM	10	1	0	0	11	105	31	0	0	136	2	105	0	0	107	254
Total	65	4	0	0	69	371	113	0	0	484	5	439	0	0	444	997
Approach %	94.2	5.8	0.0	-	-	76.7	23.3	0.0	-	-	1.1	98.9	0.0	-	-	-
Total %	6.5	0.4	0.0	-	6.9	37.2	11.3	0.0	-	48.5	0.5	44.0	0.0	-	44.5	-
PHF	0.774	0.500	0.000	-	0.750	0.883	0.856	0.000	-	0.890	0.625	0.946	0.000	-	0.949	0.955
Lights	64	4	0	-	68	360	113	0	-	473	5	422	0	-	427	968
% Lights	98.5	100.0	-	-	98.6	97.0	100.0	-	-	97.7	100.0	96.1	-	-	96.2	97.1
Buses	0	0	0	-	0	5	0	0	-	5	0	6	0	-	6	11
% Buses	0.0	0.0	-	-	0.0	1.3	0.0	-	-	1.0	0.0	1.4	-	-	1.4	1.1
Trucks	1	0	0	-	1	6	0	0	-	6	0	11	0	-	11	18
% Trucks	1.5	0.0	-	-	1.4	1.6	0.0	-	-	1.2	0.0	2.5	-	-	2.5	1.8
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Diamond Ave
Tuesday, October 2, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 10/02/2018



Turning Movement Peak Hour Data Plot (3:15 PM)

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018

Turning Movement Data

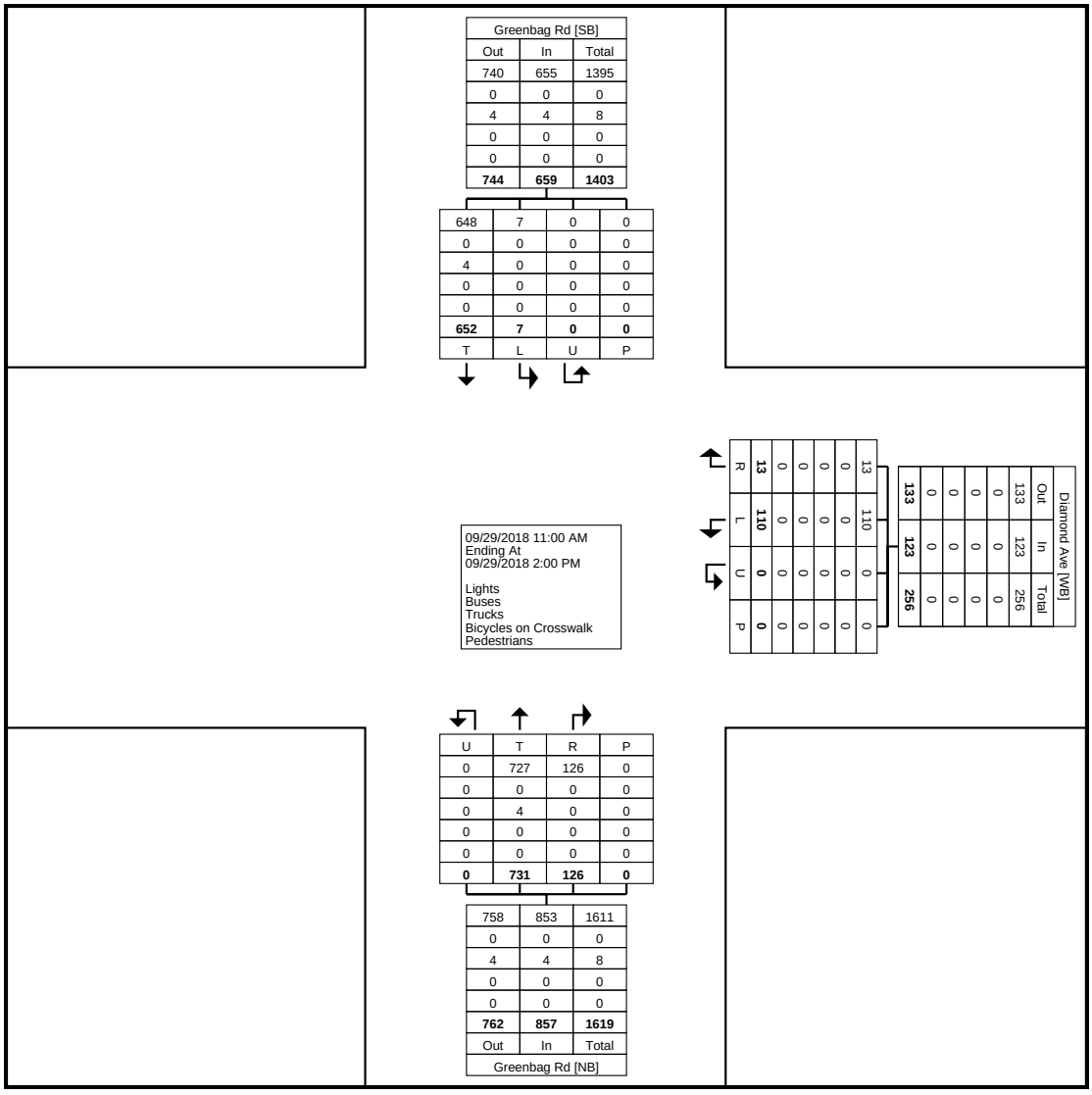
Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:00 AM	15	1	0	0	16	63	14	0	0	77	0	48	0	0	48	141
11:15 AM	10	1	0	0	11	67	10	0	0	77	0	71	0	0	71	159
11:30 AM	7	0	0	0	7	85	11	0	0	96	0	49	0	0	49	152
11:45 AM	8	1	0	0	9	83	18	0	0	101	0	70	0	0	70	180
Hourly Total	40	3	0	0	43	298	53	0	0	351	0	238	0	0	238	632
12:00 PM	15	2	0	0	17	66	6	0	0	72	2	53	0	0	55	144
12:15 PM	7	1	0	0	8	70	10	0	0	80	0	42	0	0	42	130
12:30 PM	2	1	0	0	3	46	14	0	0	60	0	64	0	0	64	127
12:45 PM	5	1	0	0	6	48	13	0	0	61	0	48	0	0	48	115
Hourly Total	29	5	0	0	34	230	43	0	0	273	2	207	0	0	209	516
1:00 PM	8	1	0	0	9	44	5	0	0	49	0	57	0	0	57	115
1:15 PM	14	0	0	0	14	51	6	0	0	57	1	52	0	0	53	124
1:30 PM	9	0	0	0	9	64	8	0	0	72	1	50	0	0	51	132
1:45 PM	10	4	0	0	14	44	11	0	0	55	3	48	0	0	51	120
Hourly Total	41	5	0	0	46	203	30	0	0	233	5	207	0	0	212	491
Grand Total	110	13	0	0	123	731	126	0	0	857	7	652	0	0	659	1639
Approach %	89.4	10.6	0.0	-	-	85.3	14.7	0.0	-	-	1.1	98.9	0.0	-	-	-
Total %	6.7	0.8	0.0	-	7.5	44.6	7.7	0.0	-	52.3	0.4	39.8	0.0	-	40.2	-
Lights	110	13	0	-	123	727	126	0	-	853	7	648	0	-	655	1631
% Lights	100.0	100.0	-	-	100.0	99.5	100.0	-	-	99.5	100.0	99.4	-	-	99.4	99.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	0	0	-	0	4	0	0	-	4	0	4	0	-	4	8
% Trucks	0.0	0.0	-	-	0.0	0.5	0.0	-	-	0.5	0.0	0.6	-	-	0.6	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018



Turning Movement Data Plot

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018

Turning Movement Peak Hour Data (11:00 AM)

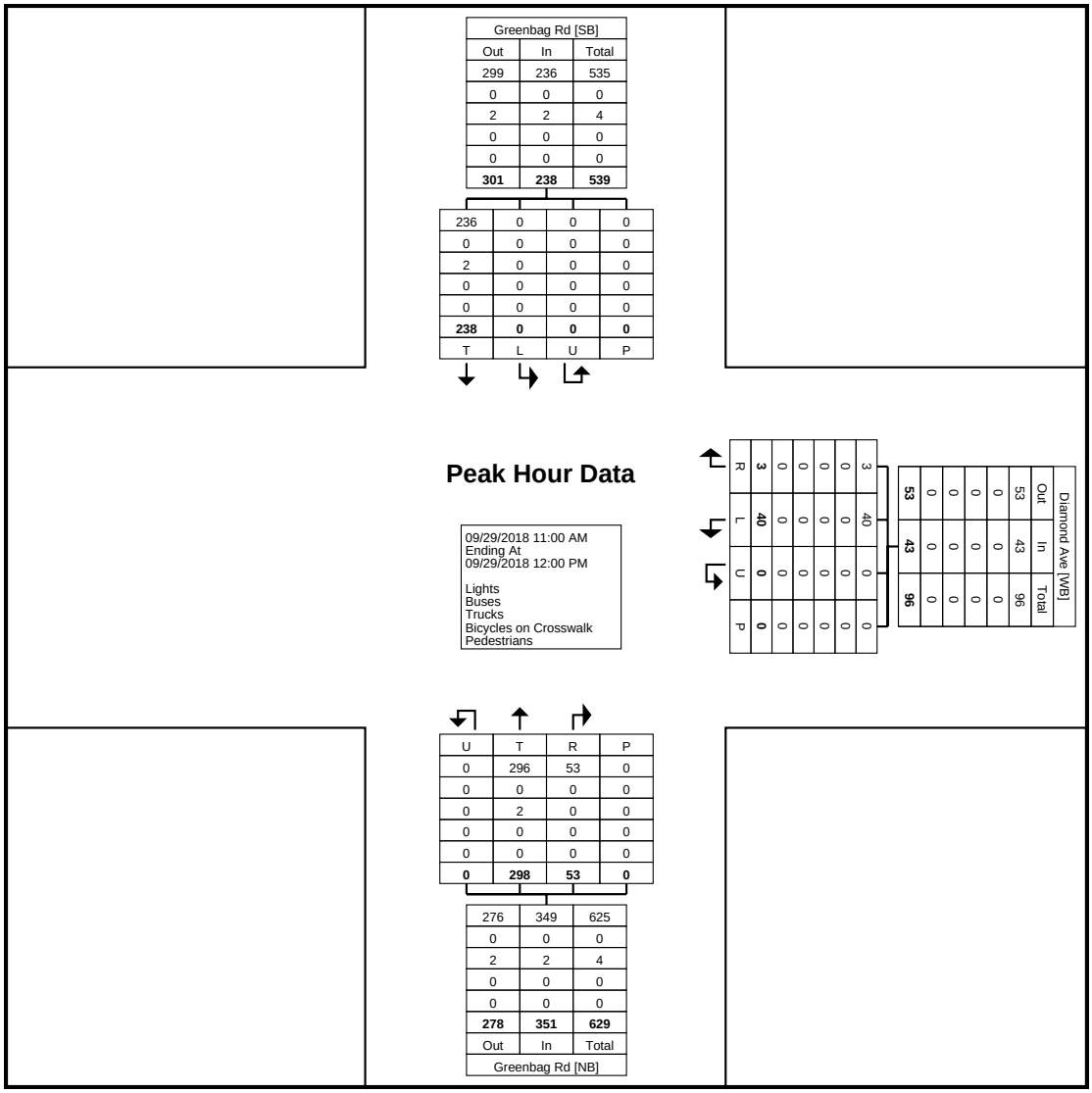
Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:00 AM	15	1	0	0	16	63	14	0	0	77	0	48	0	0	48	141
11:15 AM	10	1	0	0	11	67	10	0	0	77	0	71	0	0	71	159
11:30 AM	7	0	0	0	7	85	11	0	0	96	0	49	0	0	49	152
11:45 AM	8	1	0	0	9	83	18	0	0	101	0	70	0	0	70	180
Total	40	3	0	0	43	298	53	0	0	351	0	238	0	0	238	632
Approach %	93.0	7.0	0.0	-	-	84.9	15.1	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	6.3	0.5	0.0	-	6.8	47.2	8.4	0.0	-	55.5	0.0	37.7	0.0	-	37.7	-
PHF	0.667	0.750	0.000	-	0.672	0.876	0.736	0.000	-	0.869	0.000	0.838	0.000	-	0.838	0.878
Lights	40	3	0	-	43	296	53	0	-	349	0	236	0	-	236	628
% Lights	100.0	100.0	-	-	100.0	99.3	100.0	-	-	99.4	-	99.2	-	-	99.2	99.4
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0
Trucks	0	0	0	-	0	2	0	0	-	2	0	2	0	-	2	4
% Trucks	0.0	0.0	-	-	0.0	0.7	0.0	-	-	0.6	-	0.8	-	-	0.8	0.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018



Turning Movement Peak Hour Data Plot (11:00 AM)

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018

Turning Movement Peak Hour Data (12:00 PM)

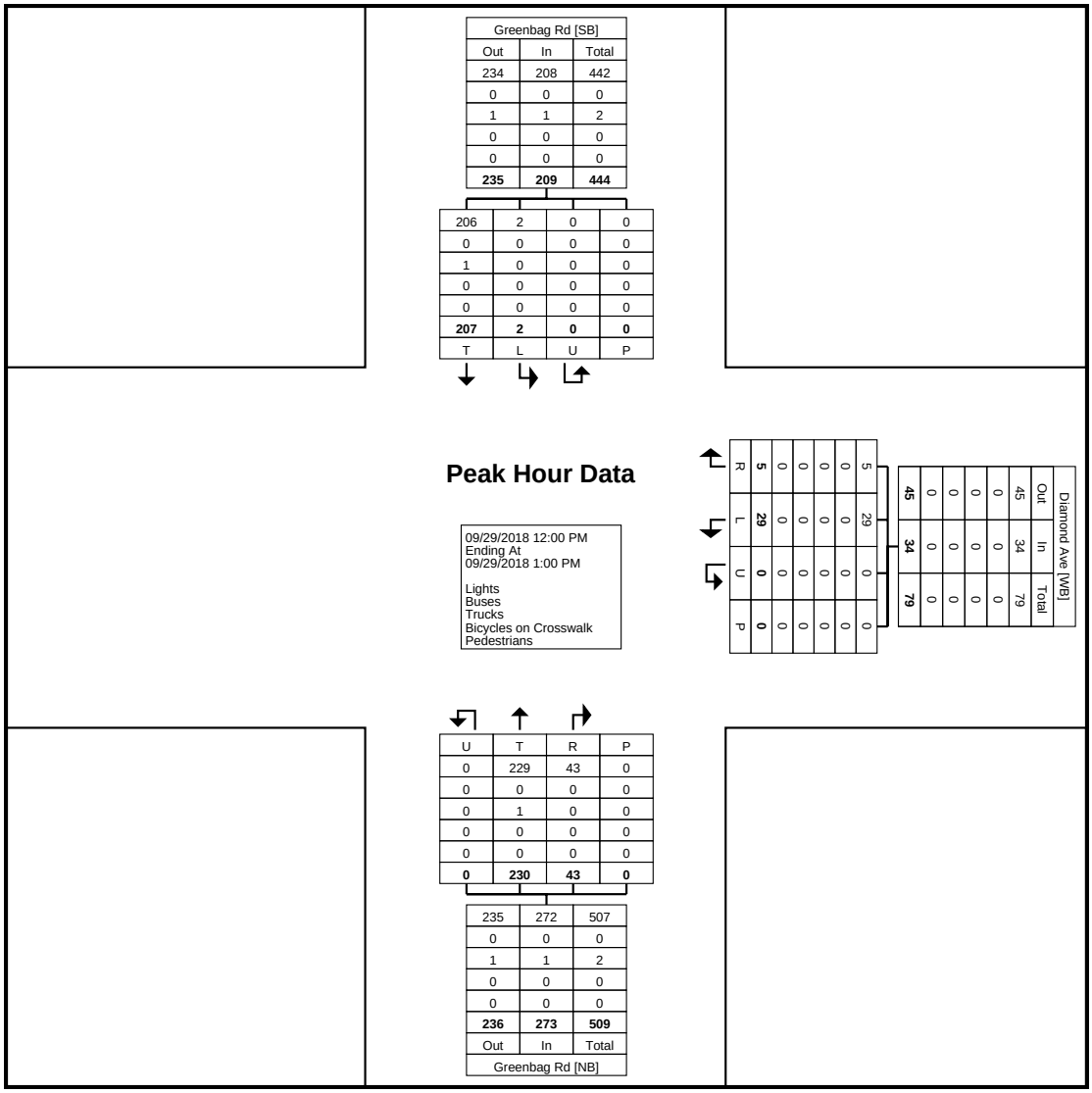
Start Time	Diamond Ave Westbound					Greenbag Rd Northbound					Greenbag Rd Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
12:00 PM	15	2	0	0	17	66	6	0	0	72	2	53	0	0	55	144
12:15 PM	7	1	0	0	8	70	10	0	0	80	0	42	0	0	42	130
12:30 PM	2	1	0	0	3	46	14	0	0	60	0	64	0	0	64	127
12:45 PM	5	1	0	0	6	48	13	0	0	61	0	48	0	0	48	115
Total	29	5	0	0	34	230	43	0	0	273	2	207	0	0	209	516
Approach %	85.3	14.7	0.0	-	-	84.2	15.8	0.0	-	-	1.0	99.0	0.0	-	-	-
Total %	5.6	1.0	0.0	-	6.6	44.6	8.3	0.0	-	52.9	0.4	40.1	0.0	-	40.5	-
PHF	0.483	0.625	0.000	-	0.500	0.821	0.768	0.000	-	0.853	0.250	0.809	0.000	-	0.816	0.896
Lights	29	5	0	-	34	229	43	0	-	272	2	206	0	-	208	514
% Lights	100.0	100.0	-	-	100.0	99.6	100.0	-	-	99.6	100.0	99.5	-	-	99.5	99.6
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Trucks	0.0	0.0	-	-	0.0	0.4	0.0	-	-	0.4	0.0	0.5	-	-	0.5	0.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Morgantown, WV
Greenbag Rd & Diamond Ave
Saturday, September 29, 2018
Location: 39.614154, -79.931369

Count Name: greenbag diamond
Site Code:
Start Date: 09/29/2018



Turning Movement Peak Hour Data Plot (12:00 PM)

Approach	Movement	2018 Existing Conditions (RAW DATA FROM TMC's)											
		Weekday AM Peak Hour				Weekday PM Peak Hour				Saturday Peak Hour			
		Volume	% HV (Trucks + Buses)		Int. PHF	Volume	% HV (Trucks + Buses)		Int. PHF	Volume	% HV (Trucks + Buses)		Int. PHF
Intersection:	**Greenbag Road (CR 857) & Mississippi Avenue**												
Eastbound	Left Turn	109	4.59%	2.87%	0.855	140	0.71%	1.10%	0.925	34	2.94%	1.58%	0.938
Greenbag Rd	Through	240	2.08%			497	1.21%			345	1.45%		
Westbound	Through	412	4.37%	5.91%		372	2.42%	1.79%		256	1.56%	1.40%	
Greenbag Rd	Right Turn	163	9.82%			132	0.00%			30	0.00%		
Southbound	Left Turn	107	17.76%	12.80%		41	0.00%	0.92%		21	0.00%	0.00%	
Mississippi Ave	Right Turn	104	10.58%			68	1.47%			27	0.00%		
Intersection:	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**												
Eastbound	Left Turn	51	7.84%	7.83%	0.917	108	0.00%	0.53%	0.892	67	2.99%	1.68%	0.979
Greenbag Rd	Through	255	6.67%			346	0.87%			232	1.29%		
	Right Turn	26	19.23%			110	0.00%			58	1.72%		
Westbound	Left Turn	22	4.55%	6.23%		77	0.00%	0.54%		46	0.00%	0.79%	
Greenbag Rd	Through	334	6.59%			275	0.73%			189	1.06%		
	Right Turn	13	0.00%			19	0.00%			18	0.00%		
Northbound	Left Turn	142	0.70%	0.72%		52	3.85%	3.25%		43	0.00%	0.00%	
Kingwood Pike	Through	149	0.67%			58	3.45%			42	0.00%		
	Right Turn	123	0.81%			44	2.27%			31	0.00%		
Southbound	Left Turn	60	0.00%	6.70%		89	1.12%	0.85%		34	0.00%	1.40%	
Dorsey Ave	Through	19	0.00%			157	0.00%			47	0.00%		
	Right Turn	115	11.30%			107	1.87%			62	3.23%		
Intersection:	**Greenbag Road (CR 857) & Luckey Lane**												
Eastbound	Left Turn	0	0.00%	7.82%	0.842	0	0.00%	0.47%	0.971	0	0.00%	1.04%	0.912
Greenbag Rd	Through	409	7.82%			423	0.47%			289	1.04%		
Westbound	Through	390	4.62%	3.96%		418	1.20%	0.92%		251	0.40%	0.34%	
Greenbag Rd	Right Turn	90	1.11%			127	0.00%			46	0.00%		
Southbound	Left Turn	44	0.00%	0.00%		55	0.00%	0.00%		44	0.00%	0.00%	
Luckey Ln	Right Turn	0	0.00%			2	0.00%			1	0.00%		
Intersection:	**Greenbag Road (CR 857) & Richard Avenue**												
Eastbound	Left Turn	59	25.42%	7.27%	0.861	13	0.00%	0.42%	0.983	7	0.00%	1.20%	0.915
Greenbag Rd	Through	395	4.56%			464	0.43%			327	1.22%		
Westbound	Through	417	4.80%	5.56%		521	0.96%	1.13%		290	0.34%	0.67%	
Greenbag Rd	Right Turn	51	11.76%			10	10.00%			10	10.00%		
Southbound	Left Turn	34	0.00%	0.00%		19	0.00%	0.00%		7	0.00%	0.00%	
Richard Ave	Right Turn	63	0.00%			23	0.00%			7	0.00%		
Intersection:	**Greenbag Road (CR 857) & Lower Aarons Creek Road (CR 64)**												
Eastbound	Through	444	4.28%	4.25%	0.809	471	2.12%	2.08%	0.941	327	0.92%	0.91%	0.0921
Greenbag Rd	Right Turn	3	0.00%			9	0.00%			4	0.00%		
Westbound	Left Turn	4	0.00%	3.23%		31	12.90%	3.74%		8	0.00%	0.69%	
Greenbag Rd	Through	399	3.26%			477	3.14%			282	0.71%		
Northbound	Left Turn	17	0.00%	0.00%		8	12.50%	15.00%		3	0.00%	0.00%	
Lower Aarons	Right Turn	16	0.00%			12	16.67%			17	0.00%		
Intersection:	**Greenbag Road (CR 857) & Diamond Avenue**												
Northbound	Through	402	5.22%	4.55%	0.881	371	2.96%	2.27%	0.955	298	0.67%	0.57%	0.878
Greenbag Rd	Right Turn	60	0.00%			113	0.00%			53	0.00%		
Southbound	Left Turn	1	0.00%	4.53%		5	0.00%	3.83%		0	0.00%	0.84%	
Greenbag Rd	Through	330	4.55%			439	3.87%			238	0.84%		
Westbound	Left Turn	76	0.00%	0.00%		65	1.54%	1.45%		40	0.00%	0.00%	
Diamond Ave	Right Turn	5	0.00%			4	0.00%			3	0.00%		

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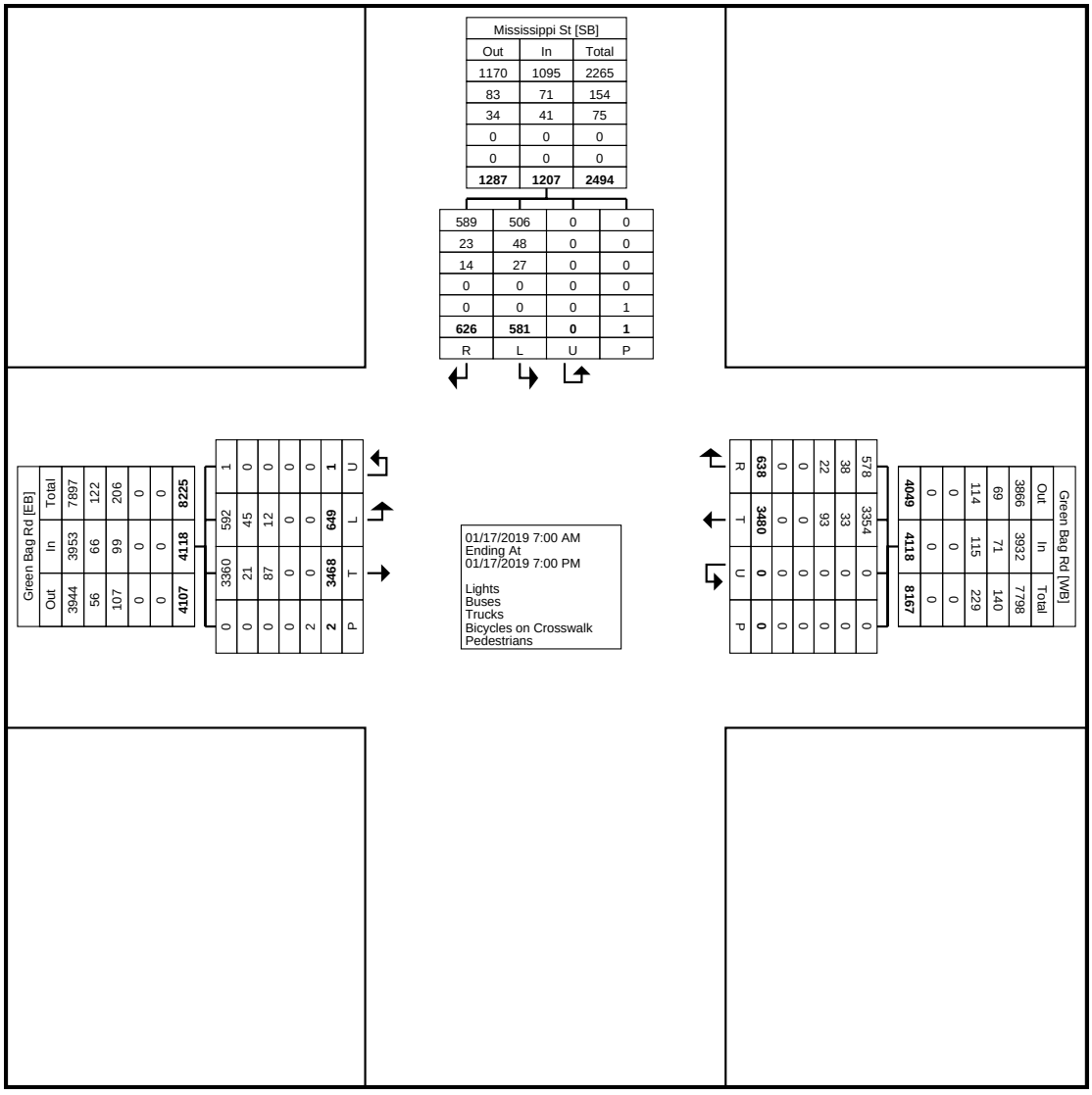
Morgantown, WV
Greenbag Rd & Mississippi Ave
Thursday, January 17, 2019
Location: 39.608313, -79.955142

Count Name: Green Bag Rd/Mississippi St
Site Code:
Start Date: 01/17/2019

Turning Movement Data

Start Time	Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	48	43	0	0	91	68	100	0	0	168	25	34	0	0	59	318
7:15 AM	29	47	0	0	76	94	36	0	0	130	50	44	0	0	94	300
7:30 AM	14	53	0	0	67	76	11	0	0	87	11	11	0	0	22	176
7:45 AM	20	72	0	0	92	141	16	0	0	157	8	14	0	0	22	271
Hourly Total	111	215	0	0	326	379	163	0	0	542	94	103	0	0	197	1065
8:00 AM	3	50	0	0	53	104	7	0	0	111	8	8	0	0	16	180
8:15 AM	3	50	0	0	53	66	12	0	0	78	8	6	0	0	14	145
8:30 AM	3	42	0	0	45	102	22	0	0	124	16	15	0	0	31	200
8:45 AM	5	47	0	0	52	88	12	0	0	100	7	13	0	0	20	172
Hourly Total	14	189	0	0	203	360	53	0	0	413	39	42	0	0	81	697
9:00 AM	4	53	0	0	57	63	6	0	0	69	8	8	0	0	16	142
9:15 AM	4	47	0	0	51	75	12	0	0	87	3	7	0	0	10	148
9:30 AM	6	42	0	0	48	63	5	0	0	68	4	7	0	0	11	127
9:45 AM	8	46	0	0	54	79	10	0	0	89	8	11	0	0	19	162
Hourly Total	22	188	0	0	210	280	33	0	0	313	23	33	0	0	56	579
10:00 AM	3	63	0	0	66	82	10	0	0	92	3	6	0	0	9	167
10:15 AM	12	60	0	0	72	56	10	0	0	66	11	8	0	0	19	157
10:30 AM	4	67	0	0	71	63	8	0	0	71	12	7	0	0	19	161
10:45 AM	7	60	0	0	67	71	10	0	0	81	12	10	0	0	22	170
Hourly Total	26	250	0	0	276	272	38	0	0	310	38	31	0	0	69	655
11:00 AM	14	62	0	0	76	51	11	0	0	62	20	12	0	0	32	170
11:15 AM	9	56	0	0	65	56	9	0	0	65	27	11	0	0	38	168
11:30 AM	13	72	0	2	85	46	17	0	0	63	6	11	0	1	17	165
11:45 AM	6	71	0	0	77	60	9	0	0	69	9	9	0	0	18	164
Hourly Total	42	261	0	2	303	213	46	0	0	259	62	43	0	1	105	667
12:00 PM	16	76	0	0	92	69	13	0	0	82	6	15	0	0	21	195
12:15 PM	9	77	1	0	87	55	9	0	0	64	3	13	0	0	16	167
12:30 PM	13	57	0	0	70	70	6	0	0	76	18	12	0	0	30	176
12:45 PM	5	56	0	0	61	65	4	0	0	69	5	10	0	0	15	145
Hourly Total	43	266	1	0	310	259	32	0	0	291	32	50	0	0	82	683
1:00 PM	9	69	0	0	78	65	6	0	0	71	8	8	0	0	16	165
1:15 PM	14	69	0	0	83	72	14	0	0	86	4	9	0	0	13	182
1:30 PM	11	67	0	0	78	55	7	0	0	62	8	12	0	0	20	160
1:45 PM	28	66	0	0	94	72	12	0	0	84	13	8	0	0	21	199
Hourly Total	62	271	0	0	333	264	39	0	0	303	33	37	0	0	70	706
2:00 PM	35	88	0	0	123	71	27	0	0	98	18	15	0	0	33	254
2:15 PM	15	79	0	0	94	61	14	0	0	75	51	49	0	0	100	269
2:30 PM	4	86	0	0	90	58	7	0	0	65	19	20	0	0	39	194
2:45 PM	12	82	0	0	94	75	5	0	0	80	22	24	0	0	46	220
Hourly Total	66	335	0	0	401	265	53	0	0	318	110	108	0	0	218	937
3:00 PM	9	82	0	0	91	76	8	0	0	84	14	11	0	0	25	200
3:15 PM	11	115	0	0	126	61	10	0	0	71	21	27	0	0	48	245
3:30 PM	7	97	0	0	104	110	10	0	0	120	16	13	0	0	29	253
3:45 PM	13	78	0	0	91	89	16	0	0	105	8	7	0	0	15	211
Hourly Total	40	372	0	0	412	336	44	0	0	380	59	58	0	0	117	909
4:00 PM	13	113	0	0	126	106	9	0	0	115	9	14	0	0	23	264
4:15 PM	19	99	0	0	118	85	15	0	0	100	7	14	0	0	21	239
4:30 PM	30	111	0	0	141	79	26	0	0	105	19	20	0	0	39	285
4:45 PM	24	100	0	0	124	89	13	0	0	102	3	12	0	0	15	241
Hourly Total	86	423	0	0	509	359	63	0	0	422	38	60	0	0	98	1029
5:00 PM	14	131	0	0	145	86	6	0	0	92	9	9	0	0	18	255
5:15 PM	14	93	0	0	107	79	14	0	0	93	5	8	0	0	13	213
5:30 PM	24	131	0	0	155	71	14	0	0	85	6	7	0	0	13	253
5:45 PM	27	87	0	0	114	72	14	0	0	86	7	10	0	0	17	217
Hourly Total	79	442	0	0	521	308	48	0	0	356	27	34	0	0	61	938
6:00 PM	16	89	0	0	105	38	9	0	0	47	3	7	0	0	10	162
6:15 PM	21	66	0	0	87	61	4	0	0	65	11	9	0	0	20	172
6:30 PM	9	56	0	0	65	51	9	0	0	60	7	5	0	0	12	137
6:45 PM	12	45	0	0	57	35	4	0	0	39	5	6	0	0	11	107
Hourly Total	58	256	0	0	314	185	26	0	0	211	26	27	0	0	53	578
Grand Total	649	3468	1	2	4118	3480	638	0	0	4118	581	626	0	1	1207	9443

Approach %	15.8	84.2	0.0	-	-	84.5	15.5	0.0	-	-	48.1	51.9	0.0	-	-	-
Total %	6.9	36.7	0.0	-	43.6	36.9	6.8	0.0	-	43.6	6.2	6.6	0.0	-	12.8	-
Lights	592	3360	1	-	3953	3354	578	0	-	3932	506	589	0	-	1095	8980
% Lights	91.2	96.9	100.0	-	96.0	96.4	90.6	-	-	95.5	87.1	94.1	-	-	90.7	95.1
Buses	45	21	0	-	66	33	38	0	-	71	48	23	0	-	71	208
% Buses	6.9	0.6	0.0	-	1.6	0.9	6.0	-	-	1.7	8.3	3.7	-	-	5.9	2.2
Trucks	12	87	0	-	99	93	22	0	-	115	27	14	0	-	41	255
% Trucks	1.8	2.5	0.0	-	2.4	2.7	3.4	-	-	2.8	4.6	2.2	-	-	3.4	2.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-



Turning Movement Data Plot

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184 Baker Rd

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Morgantown, WV
Greenbag Rd & Mississippi Ave
Thursday, January 17, 2019
Location: 39.608313, -79.955142

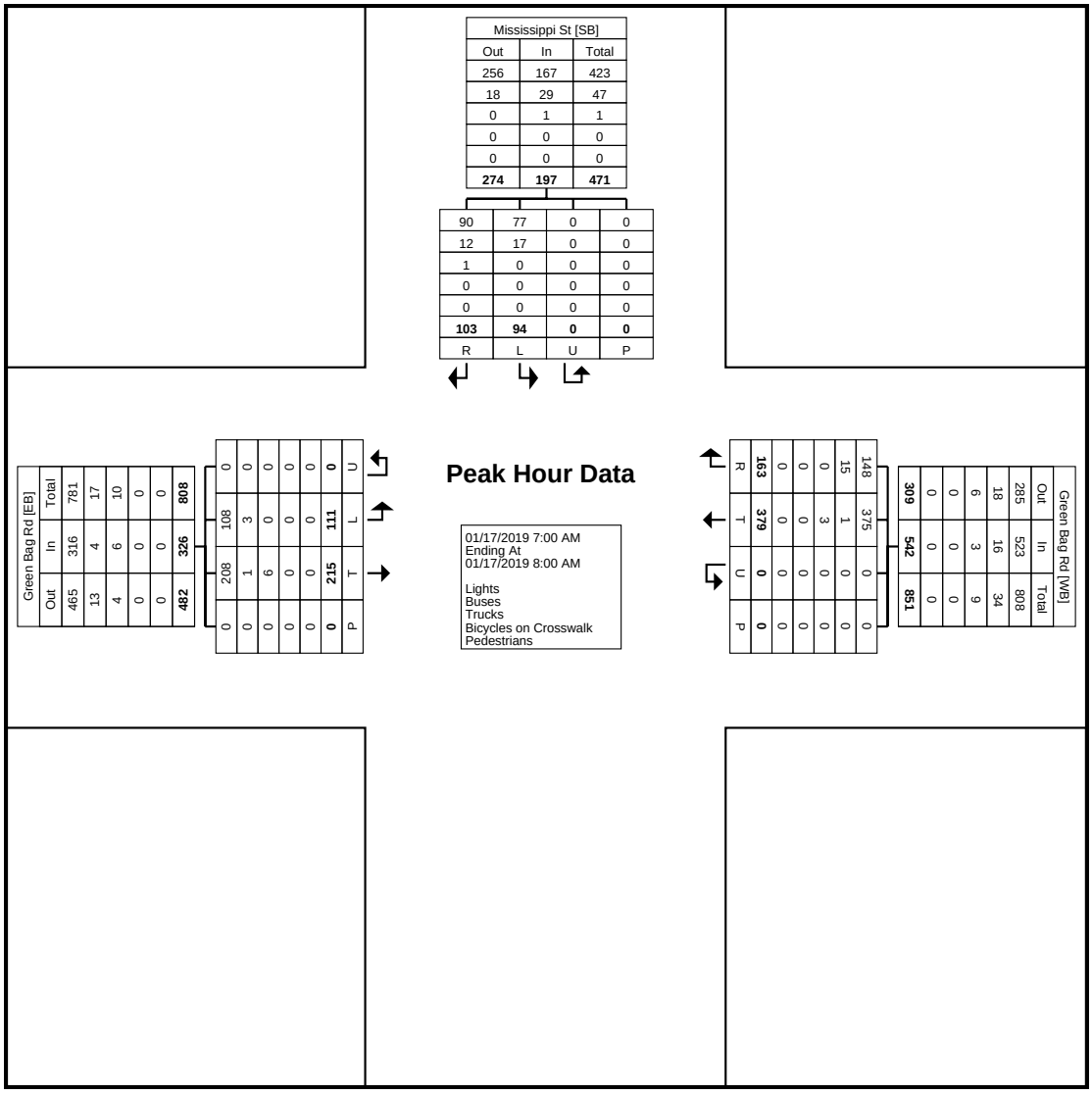
Count Name: Green Bag Rd/Mississippi St
Site Code:
Start Date: 01/17/2019

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	48	43	0	0	91	68	100	0	0	168	25	34	0	0	59	318
7:15 AM	29	47	0	0	76	94	36	0	0	130	50	44	0	0	94	300
7:30 AM	14	53	0	0	67	76	11	0	0	87	11	11	0	0	22	176
7:45 AM	20	72	0	0	92	141	16	0	0	157	8	14	0	0	22	271
Total	111	215	0	0	326	379	163	0	0	542	94	103	0	0	197	1065
Approach %	34.0	66.0	0.0	-	-	69.9	30.1	0.0	-	-	47.7	52.3	0.0	-	-	-
Total %	10.4	20.2	0.0	-	30.6	35.6	15.3	0.0	-	50.9	8.8	9.7	0.0	-	18.5	-
PHF	0.578	0.747	0.000	-	0.886	0.672	0.408	0.000	-	0.807	0.470	0.585	0.000	-	0.524	0.837
Lights	108	208	0	-	316	375	148	0	-	523	77	90	0	-	167	1006
% Lights	97.3	96.7	-	-	96.9	98.9	90.8	-	-	96.5	81.9	87.4	-	-	84.8	94.5
Buses	3	1	0	-	4	1	15	0	-	16	17	12	0	-	29	49
% Buses	2.7	0.5	-	-	1.2	0.3	9.2	-	-	3.0	18.1	11.7	-	-	14.7	4.6
Trucks	0	6	0	-	6	3	0	0	-	3	0	1	0	-	1	10
% Trucks	0.0	2.8	-	-	1.8	0.8	0.0	-	-	0.6	0.0	1.0	-	-	0.5	0.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Morgantown, WV
Greenbag Rd & Mississippi Ave
Thursday, January 17, 2019
Location: 39.608313, -79.955142

Count Name: Green Bag Rd/Mississippi St
Site Code:
Start Date: 01/17/2019



Turning Movement Peak Hour Data Plot (7:00 AM)

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184 Baker Rd

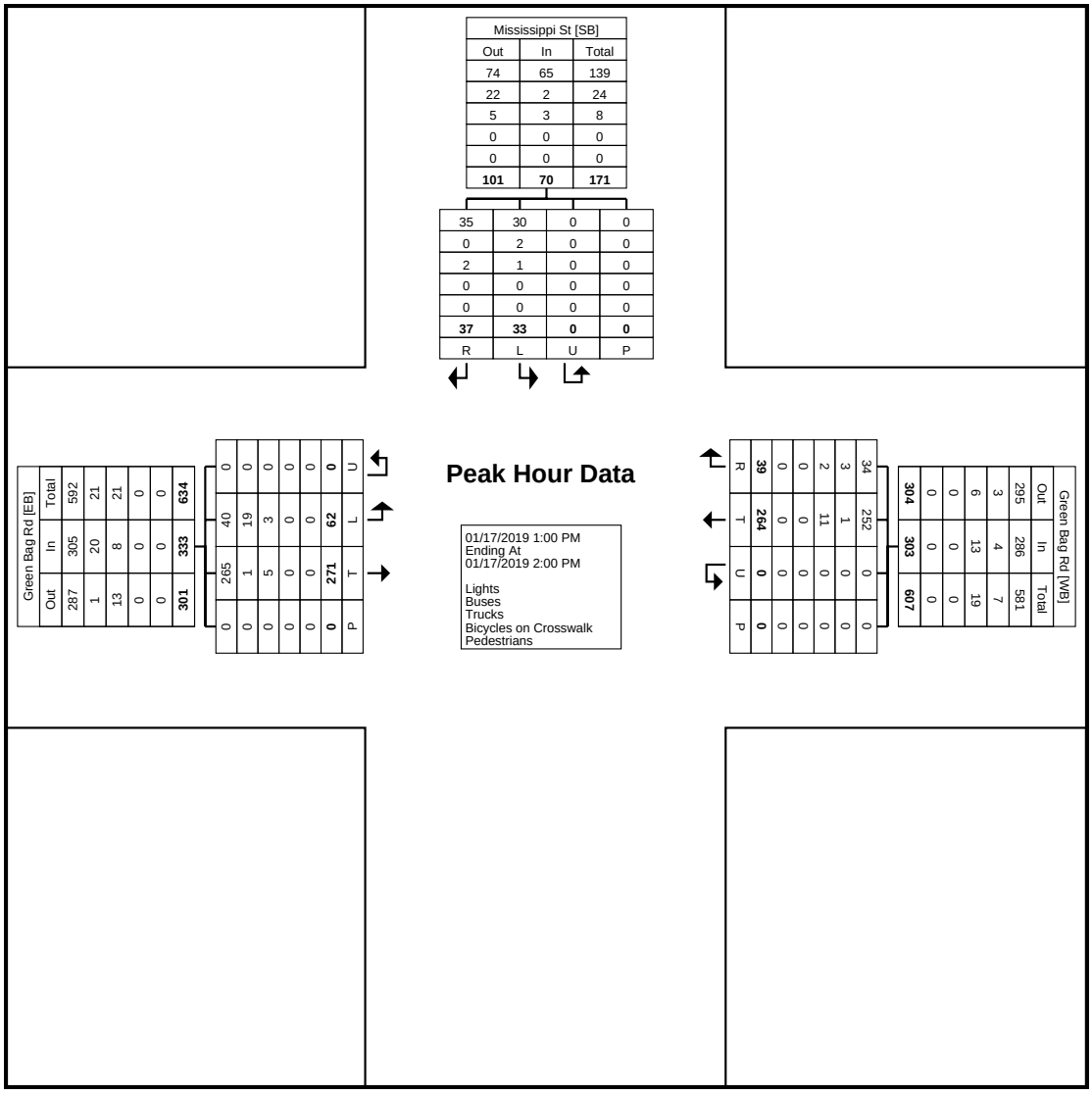
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Morgantown, WV
Greenbag Rd & Mississippi Ave
Thursday, January 17, 2019
Location: 39.608313, -79.955142

Count Name: Green Bag Rd/Mississippi St
Site Code:
Start Date: 01/17/2019

Turning Movement Peak Hour Data (1:00 PM)

Start Time	Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
1:00 PM	9	69	0	0	78	65	6	0	0	71	8	8	0	0	16	165
1:15 PM	14	69	0	0	83	72	14	0	0	86	4	9	0	0	13	182
1:30 PM	11	67	0	0	78	55	7	0	0	62	8	12	0	0	20	160
1:45 PM	28	66	0	0	94	72	12	0	0	84	13	8	0	0	21	199
Total	62	271	0	0	333	264	39	0	0	303	33	37	0	0	70	706
Approach %	18.6	81.4	0.0	-	-	87.1	12.9	0.0	-	-	47.1	52.9	0.0	-	-	-
Total %	8.8	38.4	0.0	-	47.2	37.4	5.5	0.0	-	42.9	4.7	5.2	0.0	-	9.9	-
PHF	0.554	0.982	0.000	-	0.886	0.917	0.696	0.000	-	0.881	0.635	0.771	0.000	-	0.833	0.887
Lights	40	265	0	-	305	252	34	0	-	286	30	35	0	-	65	656
% Lights	64.5	97.8	-	-	91.6	95.5	87.2	-	-	94.4	90.9	94.6	-	-	92.9	92.9
Buses	19	1	0	-	20	1	3	0	-	4	2	0	0	-	2	26
% Buses	30.6	0.4	-	-	6.0	0.4	7.7	-	-	1.3	6.1	0.0	-	-	2.9	3.7
Trucks	3	5	0	-	8	11	2	0	-	13	1	2	0	-	3	24
% Trucks	4.8	1.8	-	-	2.4	4.2	5.1	-	-	4.3	3.0	5.4	-	-	4.3	3.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (1:00 PM)

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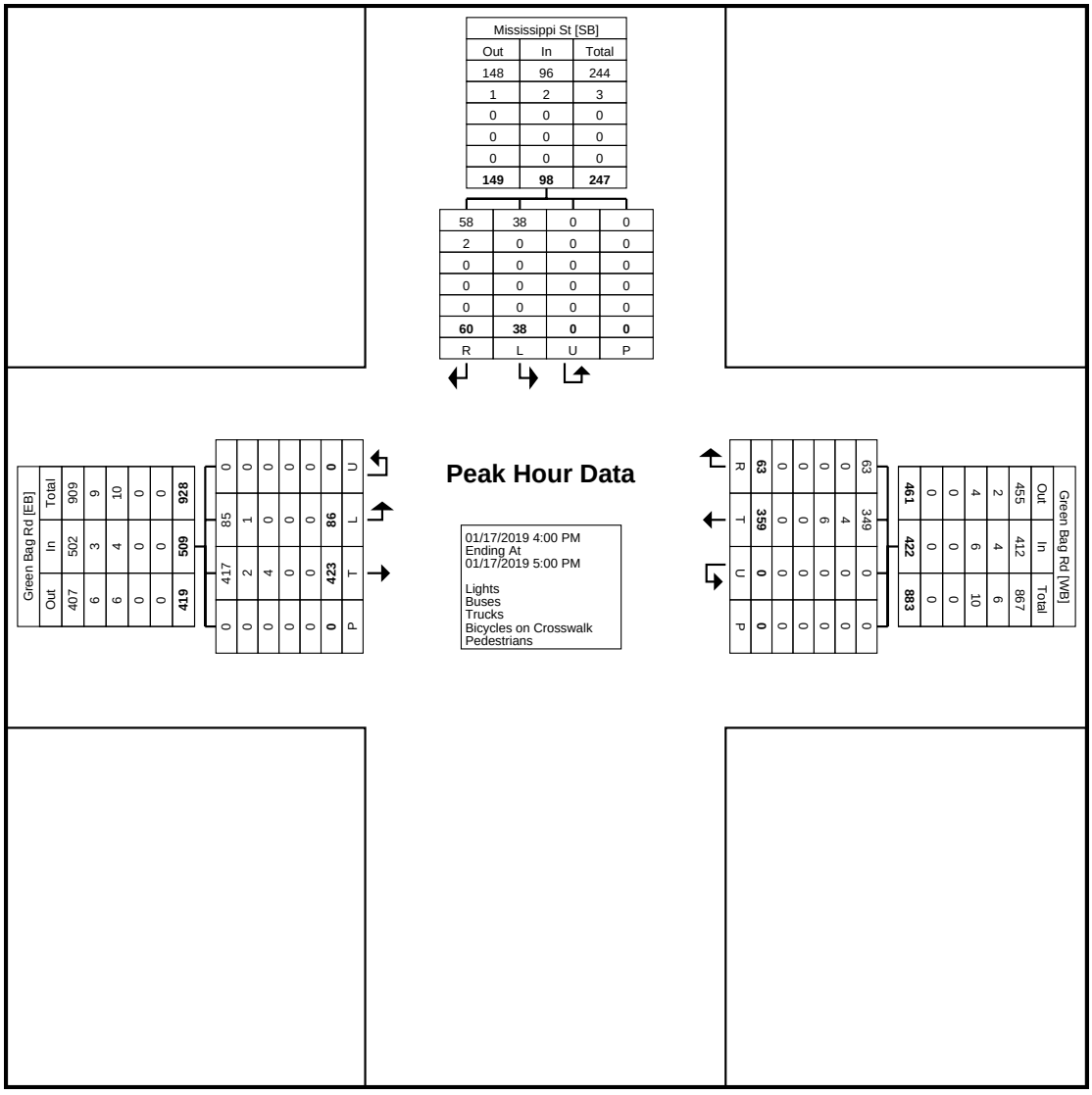
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Morgantown, WV
Greenbag Rd & Mississippi Ave
Thursday, January 17, 2019
Location: 39.608313, -79.955142

Count Name: Green Bag Rd/Mississippi St
Site Code:
Start Date: 01/17/2019

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:00 PM	13	113	0	0	126	106	9	0	0	115	9	14	0	0	23	264
4:15 PM	19	99	0	0	118	85	15	0	0	100	7	14	0	0	21	239
4:30 PM	30	111	0	0	141	79	26	0	0	105	19	20	0	0	39	285
4:45 PM	24	100	0	0	124	89	13	0	0	102	3	12	0	0	15	241
Total	86	423	0	0	509	359	63	0	0	422	38	60	0	0	98	1029
Approach %	16.9	83.1	0.0	-	-	85.1	14.9	0.0	-	-	38.8	61.2	0.0	-	-	-
Total %	8.4	41.1	0.0	-	49.5	34.9	6.1	0.0	-	41.0	3.7	5.8	0.0	-	9.5	-
PHF	0.717	0.936	0.000	-	0.902	0.847	0.606	0.000	-	0.917	0.500	0.750	0.000	-	0.628	0.903
Lights	85	417	0	-	502	349	63	0	-	412	38	58	0	-	96	1010
% Lights	98.8	98.6	-	-	98.6	97.2	100.0	-	-	97.6	100.0	96.7	-	-	98.0	98.2
Buses	1	2	0	-	3	4	0	0	-	4	0	2	0	-	2	9
% Buses	1.2	0.5	-	-	0.6	1.1	0.0	-	-	0.9	0.0	3.3	-	-	2.0	0.9
Trucks	0	4	0	-	4	6	0	0	-	6	0	0	0	-	0	10
% Trucks	0.0	0.9	-	-	0.8	1.7	0.0	-	-	1.4	0.0	0.0	-	-	0.0	1.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Turning Movement Peak Hour Data Plot (4:00 PM)

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	108	208	0	0	0	375	148	0	0	0	77	90	0	0	0
	Trucks	0	6	0	0	0	3	0	0	0	0	0	1	0	0	0
	Buses	3	1	0	0	0	1	15	0	0	0	17	12	0	0	0
	Total	111	215	0	0	0	379	163	0	0	0	94	103	0	0	0
	%HV Mvmt	2.70%	3.26%				1.06%	9.20%				18.09%	12.62%			
	%HV App	3.07%					3.51%					15.23%				
8AM	Light Vehicles	13	178	0	0	0	339	35	0	0	0	33	37	0	0	0
	Trucks	0	3	0	0	0	10	11	0	0	0	2	1	0	0	0
	Buses	1	8	0	0	0	11	7	0	0	0	4	4	0	0	0
	Total	14	189	0	0	0	360	53	0	0	0	39	42	0	0	0
	%HV Mvmt	7.14%	5.82%				5.83%	33.96%				15.38%	11.90%			
	%HV App	5.91%					9.44%					13.58%				
9AM	Light Vehicles	20	179	0	0	0	268	28	0	0	0	20	29	0	0	0
	Trucks	1	9	0	0	0	11	3	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	1	2	0	0	0	0	1	0	0	0
	Total	22	188	0	0	0	280	33	0	0	0	23	33	0	0	0
	%HV Mvmt	9.09%	4.79%				4.29%	15.15%				13.04%	12.12%			
	%HV App	5.24%					5.43%					12.50%				
10AM	Light Vehicles	23	237	0	0	0	256	32	0	0	0	32	29	0	0	0
	Trucks	0	13	0	0	0	15	3	0	0	0	3	0	0	0	0
	Buses	3	0	0	0	0	1	3	0	0	0	3	2	0	0	0
	Total	26	250	0	0	0	272	38	0	0	0	38	31	0	0	0
	%HV Mvmt	11.54%	5.20%				5.88%	15.79%				15.79%	6.45%			
	%HV App	5.80%					7.10%					11.59%				
11AM	Light Vehicles	37	251	0	0	0	205	43	0	0	0	52	41	0	0	0
	Trucks	3	10	0	0	0	7	0	0	0	0	0	2	0	0	0
	Buses	2	0	0	0	0	1	3	0	0	0	10	0	0	0	0
	Total	42	261	0	0	0	213	46	0	0	0	62	43	0	0	0
	%HV Mvmt	11.90%	3.83%				3.76%	6.52%				16.13%	4.65%			
	%HV App	4.95%					4.25%					11.43%				
12PM	Light Vehicles	39	256	1	0	0	253	31	0	0	0	29	47	0	0	0
	Trucks	3	10	0	0	0	6	0	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	43	266	1	0	0	259	32	0	0	0	32	50	0	0	0
	%HV Mvmt	9.30%	3.76%				2.32%	3.13%				9.38%	6.00%			
	%HV App	4.53%					2.41%					7.32%				
1PM	Light Vehicles	40	265	0	0	0	252	34	0	0	0	30	35	0	0	0
	Trucks	3	5	0	0	0	11	2	0	0	0	1	2	0	0	0
	Buses	19	1	0	0	0	1	3	0	0	0	2	0	0	0	0
	Total	62	271	0	0	0	264	39	0	0	0	33	37	0	0	0
	%HV Mvmt	35.48%	2.21%				4.55%	12.82%				9.09%	5.41%			
	%HV App	8.41%					5.61%					7.14%				
2PM	Light Vehicles	55	313	0	0	0	252	48	0	0	0	86	105	0	0	0
	Trucks	0	18	0	0	0	8	2	0	0	0	14	1	0	0	0
	Buses	11	4	0	0	0	5	3	0	0	0	10	2	0	0	0
	Total	66	335	0	0	0	265	53	0	0	0	110	108	0	0	0
	%HV Mvmt	16.67%	6.57%				4.91%	9.43%				21.82%	2.78%			
	%HV App	8.23%					5.66%					12.39%				

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	37	361	0	0	0	321	42	0	0	0	56	58	0	0	0
	Trucks	1	7	0	0	0	9	1	0	0	0	1	0	0	0	0
	Buses	2	4	0	0	0	6	1	0	0	0	2	0	0	0	0
	Total	40	372	0	0	0	336	44	0	0	0	59	58	0	0	0
	%HV Mvmt	7.50%	2.96%				4.46%	4.55%				5.08%	0.00%			
	%HV App	3.40%					4.47%					2.56%				
4PM	Light Vehicles	85	417	0	0	0	349	63	0	0	0	38	58	0	0	0
	Trucks	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0
	Buses	1	2	0	0	0	4	0	0	0	0	0	2	0	0	0
	Total	86	423	0	0	0	359	63	0	0	0	38	60	0	0	0
	%HV Mvmt	1.16%	1.42%				2.79%	0.00%				0.00%	3.33%			
	%HV App	1.38%					2.37%					2.04%				
5PM	Light Vehicles	78	439	0	0	0	299	48	0	0	0	27	34	0	0	0
	Trucks	1	2	0	0	0	7	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
	Total	79	442	0	0	0	308	48	0	0	0	27	34	0	0	0
	%HV Mvmt	1.27%	0.68%				2.92%	0.00%				0.00%	0.00%			
	%HV App	0.77%					2.53%					0.00%				
6PM	Light Vehicles	57	256	0	0	0	185	26	0	0	0	26	26	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	58	256	0	0	0	185	26	0	0	0	26	27	0	0	0
	%HV Mvmt	1.72%	0.00%				0.00%	0.00%				0.00%	3.70%			
	%HV App	0.32%					0.00%					1.89%				

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	144	278	0	0	0	501	198	0	0	0	103	120	0	0	0
	Trucks	0	8	0	0	0	4	0	0	0	0	0	1	0	0	0
	Buses	4	1	0	0	0	1	20	0	0	0	23	16	0	0	0
	Total	148	287	0	0	0	506	218	0	0	0	126	137	0	0	0
	%HV Mvmt															
	%HV App															
8AM	Light Vehicles	17	238	0	0	0	453	47	0	0	0	44	49	0	0	0
	Trucks	0	4	0	0	0	13	15	0	0	0	3	1	0	0	0
	Buses	1	11	0	0	0	15	9	0	0	0	5	5	0	0	0
	Total	18	253	0	0	0	481	71	0	0	0	52	55	0	0	0
	%HV Mvmt															
	%HV App															
9AM	Light Vehicles	27	239	0	0	0	358	37	0	0	0	27	39	0	0	0
	Trucks	1	12	0	0	0	15	4	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	1	3	0	0	0	0	1	0	0	0
	Total	29	251	0	0	0	374	44	0	0	0	31	44	0	0	0
	%HV Mvmt															
	%HV App															
10AM	Light Vehicles	31	317	0	0	0	342	43	0	0	0	43	39	0	0	0
	Trucks	0	17	0	0	0	20	4	0	0	0	4	0	0	0	0
	Buses	4	0	0	0	0	1	4	0	0	0	4	3	0	0	0
	Total	35	334	0	0	0	363	51	0	0	0	51	42	0	0	0
	%HV Mvmt															
	%HV App															
11AM	Light Vehicles	49	335	0	0	0	274	57	0	0	0	69	55	0	0	0
	Trucks	4	13	0	0	0	9	0	0	0	0	0	3	0	0	0
	Buses	3	0	0	0	0	1	4	0	0	0	13	0	0	0	0
	Total	56	348	0	0	0	284	61	0	0	0	82	58	0	0	0
	%HV Mvmt															
	%HV App															
12PM	Light Vehicles	52	342	1	0	0	338	41	0	0	0	39	63	0	0	0
	Trucks	4	13	0	0	0	8	0	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	57	355	1	0	0	346	42	0	0	0	43	67	0	0	0
	%HV Mvmt															
	%HV App															
1PM	Light Vehicles	53	354	0	0	0	337	45	0	0	0	40	47	0	0	0
	Trucks	4	7	0	0	0	15	3	0	0	0	1	3	0	0	0
	Buses	25	1	0	0	0	1	4	0	0	0	3	0	0	0	0
	Total	82	362	0	0	0	353	52	0	0	0	44	50	0	0	0
	%HV Mvmt															
	%HV App															
2PM	Light Vehicles	74	418	0	0	0	337	64	0	0	0	115	140	0	0	0
	Trucks	0	24	0	0	0	11	3	0	0	0	19	1	0	0	0
	Buses	15	5	0	0	0	7	4	0	0	0	13	3	0	0	0
	Total	89	447	0	0	0	355	71	0	0	0	147	144	0	0	0
	%HV Mvmt															
	%HV App															

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	49	482	0	0	0	429	56	0	0	0	75	78	0	0	0
	Trucks	1	9	0	0	0	12	1	0	0	0	1	0	0	0	0
	Buses	3	5	0	0	0	8	1	0	0	0	3	0	0	0	0
	Total	53	496	0	0	0	449	58	0	0	0	79	78	0	0	0
	%HV Mvmt															
	%HV App															
4PM	Light Vehicles	114	557	0	0	0	466	84	0	0	0	51	78	0	0	0
	Trucks	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0
	Buses	1	3	0	0	0	5	0	0	0	0	0	3	0	0	0
	Total	115	565	0	0	0	479	84	0	0	0	51	81	0	0	0
	%HV Mvmt															
	%HV App															
5PM	Light Vehicles	104	587	0	0	0	400	64	0	0	0	36	45	0	0	0
	Trucks	1	3	0	0	0	9	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
	Total	105	591	0	0	0	412	64	0	0	0	36	45	0	0	0
	%HV Mvmt															
	%HV App															
6PM	Light Vehicles	76	342	0	0	0	247	35	0	0	0	35	35	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	77	342	0	0	0	247	35	0	0	0	35	36	0	0	0
	%HV Mvmt															
	%HV App															

growth rat	1.16%
yrs	29
factor	1.3364

Appendix C. Automatic Traffic Recorder Counts

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	3	257	66	**19**	23	1	0	1	2	0	0	0	0	372
14:00	1	279	62	11	**28**	3	**2**	5	2	0	0	0	0	393
15:00	4	313	80	5	25	**8**	0	**6**	**3**	0	0	0	0	444
16:00	3	418	**87**	4	28	4	0	0	0	0	0	0	0	**544**
17:00	**5**	**426**	86	1	16	3	0	0	1	0	0	0	0	538
18:00	3	259	55	0	17	0	0	0	1	0	0	0	0	335
19:00	1	158	47	1	10	0	0	0	0	0	0	0	0	217
20:00	2	151	45	0	5	3	0	0	0	0	0	0	0	206
21:00	1	110	23	0	3	0	0	0	0	0	0	0	0	137
22:00	0	71	9	0	0	0	0	1	0	0	0	0	0	81
23:00	0	48	6	0	0	0	0	0	0	0	0	0	0	54
Day Total	23	2490	566	41	155	22	2	13	9	0	0	0	0	3321
Percent	0.7%	75.0%	17.0%	1.2%	4.7%	0.7%	0.1%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	17:00 5	17:00 426	16:00 87	13:00 19	14:00 28	15:00 8	14:00 2	15:00 6	15:00 3					16:00 544

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/29/18	0	30	1	0	0	0	0	0	0	0	0	0	0	31
01:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
02:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
03:00	0	10	3	0	0	0	0	0	0	0	0	0	0	13
04:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
05:00	0	8	3	0	3	0	0	0	0	0	0	0	0	14
06:00	1	27	6	0	1	0	0	0	0	0	0	0	0	35
07:00	1	56	16	0	3	0	0	1	0	0	0	0	0	77
08:00	1	88	32	0	**12**	1	0	0	0	0	0	0	0	134
09:00	1	155	46	**1**	8	1	0	0	0	0	0	0	0	212
10:00	0	224	57	0	10	1	0	1	0	0	0	0	0	293
11:00	**4**	**269**	**81**	0	8	**3**	0	**3**	0	0	0	0	0	**368**
12 PM	3	**208**	**69**	0	**12**	0	**1**	0	0	0	0	0	0	**293**
13:00	3	178	53	0	5	0	0	1	0	0	0	0	0	240
14:00	2	207	57	0	9	**2**	0	**3**	0	0	0	0	0	280
15:00	**4**	191	46	0	6	0	0	0	0	0	0	0	0	247
16:00	3	183	57	0	7	1	0	0	0	0	0	0	0	251
17:00	1	182	45	0	5	2	0	0	0	0	0	0	0	235
18:00	2	180	39	0	8	1	0	0	**1**	0	0	0	0	231
19:00	0	121	33	0	4	0	0	0	0	0	0	0	0	158
20:00	0	130	25	0	3	0	0	0	0	0	0	0	0	158
21:00	0	103	13	0	3	0	0	0	0	0	0	0	0	119
22:00	0	51	14	0	1	0	0	0	0	0	0	0	0	66
23:00	0	45	7	0	1	0	0	0	0	0	0	0	0	53
Day Total	26	2678	709	1	109	12	1	9	1	0	0	0	0	3546
Percent	0.7%	75.5%	20.0%	0.0%	3.1%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	09:00	08:00	11:00		11:00						11:00
Vol.	4	269	81	1	12	3		3						368
PM Peak	15:00	12:00	12:00		12:00	14:00	12:00	14:00	18:00					12:00
Vol.	4	208	69		12	2	1	3	1					293

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/30/18	0	25	3	0	2	0	0	1	0	0	0	0	0	31
01:00	0	9	4	0	2	0	0	0	0	0	0	0	0	15
02:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
03:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
04:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
05:00	0	3	4	0	0	0	0	0	0	0	0	0	0	7
06:00	0	24	4	0	2	0	0	0	0	0	0	0	0	30
07:00	0	40	8	0	1	0	0	0	0	0	0	0	0	49
08:00	1	58	14	0	1	0	0	1	0	0	0	0	0	75
09:00	2	97	25	0	7	0	0	0	0	0	0	0	0	131
10:00	**3**	120	**45**	0	8	0	0	**2**	0	0	0	0	0	178
11:00	3	**160**	38	0	**9**	0	0	2	0	0	0	0	0	**212**
12 PM	4	210	**55**	0	5	0	0	0	0	0	0	0	0	274
13:00	**12**	209	55	0	**12**	**1**	0	**1**	0	0	0	0	0	**290**
14:00	5	211	45	0	8	0	0	0	0	0	0	0	0	269
15:00	6	207	36	0	9	0	0	1	0	0	0	0	0	259
16:00	8	**215**	51	0	10	0	0	0	0	0	0	0	0	284
17:00	3	206	44	0	3	0	0	1	0	0	0	0	0	257
18:00	1	146	32	0	10	0	0	0	0	0	0	0	0	189
19:00	1	124	28	**1**	6	0	0	1	0	0	0	0	0	161
20:00	1	123	26	0	7	0	0	1	0	0	0	0	0	158
21:00	0	62	6	0	3	0	0	0	0	0	0	0	0	71
22:00	0	32	6	0	1	0	0	1	0	0	0	0	0	40
23:00	0	18	7	0	0	0	0	0	0	0	0	0	0	25
Day Total	50	2320	542	1	106	1	0	12	0	0	0	0	0	3032
Percent	1.6%	76.5%	17.9%	0.0%	3.5%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	10:00		11:00			10:00						11:00
Vol.	3	160	45		9			2						212
PM Peak	13:00	16:00	12:00	19:00	13:00	13:00		13:00						13:00
Vol.	12	215	55	1	12	1		1						290

Tri-State Traffic Data, Inc.

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610-466-1469

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Site Code:
Station ID:

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Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/01/18	1	9	2	2	0	0	0	0	0	0	0	0	0	14
01:00	0	9	3	0	1	0	0	0	0	0	0	0	0	13
02:00	0	5	0	0	1	1	0	0	0	0	0	0	0	7
03:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
04:00	0	8	4	0	4	2	0	0	0	0	0	0	0	18
05:00	0	38	12	2	6	0	0	1	0	0	0	0	0	59
06:00	2	111	48	1	24	0	0	1	0	0	0	0	0	187
07:00	**4**	**236**	**109**	5	**28**	0	0	1	0	0	0	0	0	**383**
08:00	1	211	51	**7**	19	3	0	2	**1**	**1**	0	0	0	296
09:00	3	135	60	2	18	2	**2**	0	0	0	0	0	0	222
10:00	0	156	65	2	20	**4**	0	1	1	0	0	0	0	249
11:00	1	234	54	2	19	3	0	**4**	1	0	0	0	0	318
12 PM	3	273	98	2	29	**4**	0	3	**2**	0	0	0	0	414
13:00	2	253	67	**27**	28	3	**1**	**4**	1	0	0	0	0	386
14:00	**9**	269	77	6	**31**	3	0	2	0	0	0	0	0	397
15:00	5	288	98	4	31	4	0	4	1	0	0	0	0	435
16:00	6	364	89	1	20	2	0	3	2	0	0	0	0	487
17:00	3	**458**	**115**	1	25	0	0	2	1	0	0	0	0	**605**
18:00	0	283	72	0	14	0	0	3	1	0	0	0	0	373
19:00	0	214	52	0	11	0	0	0	0	0	0	0	0	277
20:00	0	134	29	1	3	0	0	1	0	0	0	0	0	168
21:00	0	78	17	0	4	0	0	0	0	0	0	0	0	99
22:00	1	35	6	0	0	0	0	1	1	0	0	0	0	44
23:00	0	30	9	0	0	0	0	0	0	0	0	0	0	39
Day Total	41	3835	1137	65	337	31	3	33	12	1	0	0	0	5495
Percent	0.7%	69.8%	20.7%	1.2%	6.1%	0.6%	0.1%	0.6%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	07:00	10:00	09:00	11:00	08:00	08:00				07:00
Vol.	4	236	109	7	28	4	2	4	1	1				383
PM Peak	14:00	17:00	17:00	13:00	14:00	12:00	13:00	13:00	12:00					17:00
Vol.	9	458	115	27	31	4	1	4	2					605

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EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/02/18	0	19	2	0	0	0	0	0	0	0	0	0	0	21
01:00	0	6	0	0	2	0	0	0	0	0	0	0	0	8
02:00	0	2	1	0	1	0	0	0	0	0	0	0	0	4
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	6	5	0	0	0	0	1	0	0	0	0	0	12
05:00	**3**	35	13	2	7	1	0	0	0	0	0	0	0	61
06:00	1	112	56	2	**28**	0	0	0	0	0	0	0	0	199
07:00	2	**285**	**111**	4	21	3	0	**3**	0	0	0	0	0	**429**
08:00	0	163	57	4	21	1	0	2	**2**	0	0	0	0	250
09:00	1	144	55	3	24	**4**	**1**	0	1	0	0	0	0	233
10:00	2	144	55	**7**	16	4	0	3	1	0	0	0	0	232
11:00	1	231	73	2	28	2	0	2	2	0	0	0	0	341
12 PM	**7**	279	77	3	35	1	0	**5**	2	0	0	0	0	409
13:00	2	240	66	**21**	26	0	0	1	3	0	0	0	0	359
14:00	5	233	75	16	21	**3**	0	2	3	0	0	0	0	358
15:00	2	300	99	8	30	2	0	0	**4**	0	0	0	0	445
16:00	1	399	99	3	28	1	0	0	1	0	0	0	0	532
17:00	3	**492**	**123**	1	**41**	1	0	0	0	0	0	0	0	**661**
18:00	2	277	83	0	15	1	0	1	0	0	0	0	0	379
19:00	2	197	45	0	6	1	0	0	0	0	0	0	0	251
20:00	0	123	24	0	4	0	0	2	0	0	0	0	0	153
21:00	1	72	17	0	5	0	0	0	0	0	0	0	0	95
22:00	0	52	8	0	0	0	0	0	0	0	0	0	0	60
23:00	0	31	7	0	0	0	0	0	0	0	0	0	0	38
Day Total	35	3845	1151	76	359	25	1	22	19	0	0	0	0	5533
Percent	0.6%	69.5%	20.8%	1.4%	6.5%	0.5%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	07:00	10:00	06:00	09:00	09:00	07:00	08:00					07:00
Vol.	3	285	111	7	28	4	1	3	2					429
PM Peak	12:00	17:00	17:00	13:00	17:00	14:00		12:00	15:00					17:00
Vol.	7	492	123	21	41	3		5	4					661

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Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/03/18	0	16	2	0	2	0	0	0	0	0	0	0	0	20
01:00	0	8	1	0	1	0	0	0	**1**	0	0	0	0	11
02:00	0	6	3	0	2	0	0	0	0	0	0	0	0	11
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	1	4	7	0	3	1	0	0	0	0	0	0	0	16
05:00	1	28	9	2	7	**3**	0	0	1	0	0	0	0	51
06:00	1	110	37	3	**29**	1	0	2	0	0	0	0	0	183
07:00	0	**273**	**105**	2	24	2	0	0	0	0	0	0	0	**406**
08:00	**5**	203	55	**9**	23	2	0	0	1	0	0	0	0	298
09:00	2	155	54	3	26	1	0	1	1	0	0	0	0	243
10:00	3	170	64	6	21	3	**1**	**3**	1	0	0	0	0	272
11:00	4	217	78	1	26	0	0	3	0	0	0	0	0	329
12 PM	3	261	80	1	23	2	0	1	0	0	0	0	0	371
13:00	3	219	71	**21**	29	3	0	**2**	0	0	0	0	0	348
14:00	3	225	90	10	33	6	0	2	**3**	0	0	0	0	372
15:00	**7**	277	67	7	**37**	**7**	0	0	1	0	0	0	0	403
16:00	3	410	113	1	36	2	0	2	0	0	0	0	0	567
17:00	1	**444**	**114**	0	26	2	0	2	0	0	0	0	0	**589**
18:00	0	292	78	0	26	1	0	0	0	0	0	0	0	397
19:00	3	204	41	0	14	0	0	0	0	0	0	0	0	262
20:00	1	163	26	0	7	0	0	0	0	0	0	0	0	197
21:00	0	79	20	0	1	0	0	1	0	0	0	0	0	101
22:00	1	53	12	0	3	0	0	0	0	0	0	0	0	69
23:00	1	29	3	0	4	0	0	0	0	0	0	0	0	37
Day Total	43	3850	1130	66	403	36	1	19	9	0	0	0	0	5557
Percent	0.8%	69.3%	20.3%	1.2%	7.3%	0.6%	0.0%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	08:00	06:00	05:00	10:00	10:00	01:00					07:00
Vol.	5	273	105	9	29	3	1	3	1					406
PM Peak	15:00	17:00	17:00	13:00	15:00	15:00		13:00	14:00					17:00
Vol.	7	444	114	21	37	7		2	3					589

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Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/04/18	0	26	1	0	0	0	0	0	0	0	0	0	0	27
01:00	0	16	2	0	0	0	0	0	0	0	0	0	0	18
02:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
03:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
04:00	0	4	6	0	5	2	0	0	**1**	0	0	0	0	18
05:00	0	28	10	2	10	0	0	1	0	0	0	0	0	51
06:00	2	108	36	3	29	2	1	2	0	0	0	0	0	183
07:00	1	**281**	**99**	2	**34**	3	1	0	0	0	0	0	0	**421**
08:00	3	168	63	**7**	31	**4**	1	**4**	1	0	0	0	0	282
09:00	0	156	44	1	31	3	**2**	3	1	0	0	0	0	241
10:00	**7**	189	61	6	28	4	0	2	0	0	0	0	0	297
11:00	1	233	73	1	31	3	0	2	0	0	0	0	0	344
12 PM	4	284	86	3	26	3	0	**4**	0	0	0	0	0	410
13:00	2	208	89	**22**	32	**5**	0	2	1	0	0	0	0	361
14:00	3	268	74	12	36	3	0	3	**3**	0	0	0	0	402
15:00	**5**	275	86	5	30	5	0	2	0	0	0	0	0	408
16:00	2	377	92	2	31	4	0	2	0	0	0	0	0	510
17:00	1	**448**	**104**	2	**44**	2	0	2	1	0	0	0	0	**604**
18:00	1	260	72	2	16	2	0	0	0	0	0	0	0	353
19:00	1	174	49	1	17	0	0	1	0	0	0	0	0	243
20:00	0	122	29	0	5	0	0	0	0	0	0	0	0	156
21:00	1	65	7	0	6	1	0	0	0	0	0	0	0	80
22:00	0	52	13	0	1	0	0	0	0	0	0	0	0	66
23:00	0	46	7	0	3	0	0	0	0	0	0	0	0	56
Day Total	34	3797	1105	71	447	46	5	30	8	0	0	0	0	5543
Percent	0.6%	68.5%	19.9%	1.3%	8.1%	0.8%	0.1%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	08:00	07:00	08:00	09:00	08:00	04:00					07:00
Vol.	7	281	99	7	34	4	2	4	1					421
PM Peak	15:00	17:00	17:00	13:00	17:00	13:00		12:00	14:00					17:00
Vol.	5	448	104	22	44	5		4	3					604

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/05/18	0	19	1	0	1	0	0	0	0	0	0	0	0	21
01:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
02:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
03:00	0	7	0	0	2	0	0	0	0	0	0	0	0	9
04:00	0	5	1	0	6	1	0	0	0	0	0	0	0	13
05:00	1	22	12	2	8	2	0	0	0	0	0	0	0	47
06:00	2	114	39	4	30	1	0	0	0	0	0	0	0	190
07:00	2	**275**	**100**	4	**34**	1	0	1	1	0	0	0	0	**418**
08:00	3	169	57	6	20	**3**	0	0	1	0	0	0	0	259
09:00	3	157	53	3	25	3	0	2	**5**	0	0	0	0	251
10:00	0	171	52	3	31	2	0	**3**	3	0	0	0	0	265
11:00	**4**	255	85	**7**	29	1	0	2	1	0	0	0	0	384
12 PM	2	271	65	3	29	2	0	2	0	0	0	0	0	374
13:00	**4**	249	65	**20**	39	**6**	0	**5**	**2**	**1**	0	0	0	391
14:00	2	254	83	12	**42**	3	0	2	2	0	0	0	0	400
15:00	3	**351**	**86**	5	36	1	**1**	1	0	0	0	0	0	**484**
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	26	2343	703	69	333	26	1	18	15	1	0	0	0	3535
Percent	0.7%	66.3%	19.9%	2.0%	9.4%	0.7%	0.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	11:00	07:00	08:00		10:00	09:00					07:00
Vol.	4	275	100	7	34	3		3	5					418
PM Peak	13:00	15:00	15:00	13:00	14:00	13:00	15:00	13:00	13:00	13:00				15:00
Vol.	4	351	86	20	42	6	1	5	2	1				484
Grand Total	278	25158	7043	390	2249	199	14	156	73	2	0	0	0	35562
Percent	0.8%	70.7%	19.8%	1.1%	6.3%	0.6%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	1	259	70	0	36	**5**	0	**5**	1	0	0	0	0	377
14:00	2	277	82	**6**	41	2	0	1	0	0	0	0	0	411
15:00	3	283	**106**	5	**43**	3	0	4	**2**	0	0	0	**1**	450
16:00	**4**	**326**	99	4	34	5	0	4	0	0	0	0	0	**476**
17:00	3	281	72	5	31	2	0	0	0	0	0	0	0	394
18:00	2	227	57	1	14	2	0	3	0	0	0	0	0	306
19:00	2	142	35	0	11	0	0	1	0	0	0	0	0	191
20:00	3	117	15	0	8	1	0	0	0	0	0	0	0	144
21:00	0	94	22	0	8	0	0	0	0	0	0	0	0	124
22:00	0	56	14	0	7	0	0	0	0	0	0	0	0	77
23:00	2	31	8	0	0	1	0	0	0	0	0	0	0	42
Day Total	22	2093	580	21	233	21	0	18	3	0	0	0	1	2992
Percent	0.7%	70.0%	19.4%	0.7%	7.8%	0.7%	0.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak	16:00	16:00	15:00	14:00	15:00	13:00		13:00	15:00				15:00	16:00
Vol.	4	326	106	6	43	5		5	2				1	476

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/29/18	0	31	11	0	1	1	0	0	0	0	0	0	0	44
01:00	3	15	0	**1**	1	0	0	0	0	0	0	0	0	20
02:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
03:00	0	7	4	0	1	0	0	0	0	0	0	0	0	12
04:00	0	10	5	0	1	0	0	0	0	0	0	0	0	16
05:00	0	24	14	0	8	0	**2**	0	0	0	0	0	0	48
06:00	0	41	13	0	5	0	0	0	0	0	0	0	0	59
07:00	0	78	19	0	2	0	1	1	0	**1**	0	0	**1**	103
08:00	0	136	38	0	12	1	1	2	0	0	0	0	0	190
09:00	**4**	172	50	0	9	**2**	1	**3**	0	0	0	0	0	241
10:00	2	**202**	**62**	1	**18**	0	1	0	0	0	0	0	0	**286**
11:00	0	184	54	0	16	2	0	0	0	0	0	0	0	256
12 PM	0	181	50	0	16	**2**	0	0	0	0	0	0	0	249
13:00	**3**	185	50	**1**	**17**	0	0	0	0	0	0	0	0	256
14:00	2	189	60	0	9	0	0	1	0	0	0	0	0	261
15:00	3	185	48	0	8	0	0	0	0	0	0	0	0	244
16:00	2	**191**	**63**	0	12	0	0	1	0	0	0	0	0	**269**
17:00	1	171	45	0	5	0	0	1	0	0	0	0	0	223
18:00	3	121	34	0	3	0	0	0	0	0	0	0	0	161
19:00	3	108	41	0	5	0	0	**2**	0	0	0	0	0	159
20:00	0	86	24	0	8	0	0	0	0	0	0	0	0	118
21:00	0	49	11	0	3	0	0	0	0	0	0	0	0	63
22:00	0	49	18	0	3	0	0	0	0	0	0	0	0	70
23:00	0	32	4	0	1	0	0	0	0	0	0	0	0	37
Day Total	26	2459	720	3	164	8	6	11	0	1	0	0	1	3399
Percent	0.8%	72.3%	21.2%	0.1%	4.8%	0.2%	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	10:00	10:00	01:00	10:00	09:00	05:00	09:00		07:00			07:00	10:00
Vol.	4	202	62	1	18	2	2	3		1			1	286
PM Peak	13:00	16:00	16:00	13:00	13:00	12:00		19:00						16:00
Vol.	3	191	63	1	17	2		2						269

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
09/30/18	0	20	3	0	2	0	0	0	0	0	0	0	0	25
01:00	0	9	3	0	1	0	0	0	0	0	0	0	0	13
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
04:00	0	8	0	0	1	0	0	0	0	0	0	0	0	9
05:00	0	12	9	0	3	0	0	**2**	0	0	0	0	0	26
06:00	0	37	5	0	5	0	0	0	0	0	0	0	0	47
07:00	0	52	15	0	4	0	0	1	0	0	0	0	0	72
08:00	0	64	13	**1**	6	0	0	0	0	0	0	0	0	84
09:00	0	100	16	0	13	0	0	1	0	0	0	0	0	130
10:00	**4**	128	**40**	0	**15**	0	0	2	0	0	0	0	0	189
11:00	2	**179**	30	0	7	0	0	0	0	0	0	0	0	**218**
12 PM	**8**	201	52	0	**18**	**1**	0	2	0	0	0	0	0	282
13:00	4	**227**	43	0	11	0	0	0	0	0	0	0	0	**285**
14:00	1	198	40	0	12	0	0	1	0	0	0	0	0	252
15:00	6	187	39	0	8	0	0	0	0	0	0	0	0	240
16:00	4	190	**53**	0	13	0	0	**3**	0	0	0	0	0	263
17:00	6	156	40	0	9	0	0	0	0	0	0	0	0	211
18:00	4	127	21	**2**	5	0	0	0	0	0	0	0	0	159
19:00	1	91	23	0	2	0	0	0	0	0	0	0	0	117
20:00	0	67	23	0	8	0	0	1	0	0	0	0	0	99
21:00	0	40	11	0	1	0	0	0	0	0	0	0	0	52
22:00	0	20	8	0	3	0	0	0	0	0	0	0	0	31
23:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
Day Total	40	2143	493	3	147	1	0	13	0	0	0	0	0	2840
Percent	1.4%	75.5%	17.4%	0.1%	5.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	10:00	08:00	10:00			05:00						11:00
Vol.	4	179	40	1	15			2						218
PM Peak	12:00	13:00	16:00	18:00	12:00	12:00		16:00						13:00
Vol.	8	227	53	2	18	1		3						285

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Weather: Clear
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/01/18	0	2	1	0	1	0	0	0	0	0	0	0	0	4
01:00	0	4	1	0	1	0	0	0	0	0	0	0	0	6
02:00	0	4	1	0	0	0	0	0	**1**	0	0	0	0	6
03:00	0	11	1	0	2	0	0	0	0	0	0	0	0	14
04:00	0	14	6	0	3	0	0	0	0	0	0	0	0	23
05:00	0	38	26	2	21	1	0	**4**	1	0	0	0	0	93
06:00	3	141	49	2	18	0	1	1	0	**3**	0	0	**1**	219
07:00	3	333	84	10	37	**4**	4	0	0	0	0	0	0	475
08:00	7	**342**	**99**	**17**	**44**	2	**6**	2	1	0	0	0	0	**520**
09:00	**8**	201	66	4	21	3	4	2	0	1	0	0	0	310
10:00	3	171	45	2	28	3	2	1	0	0	0	0	0	255
11:00	3	213	53	3	34	4	6	1	1	1	0	0	0	319
12 PM	**10**	251	82	4	**35**	**6**	**7**	1	0	**3**	0	0	**1**	400
13:00	5	226	69	2	21	3	5	**5**	1	0	0	0	1	338
14:00	6	303	98	2	34	3	1	1	1	1	0	0	1	451
15:00	8	**324**	115	**6**	22	4	2	1	0	0	0	0	0	**482**
16:00	3	294	**117**	3	29	0	0	1	**2**	1	0	0	0	450
17:00	4	309	102	1	24	0	0	0	0	1	0	0	0	441
18:00	7	212	47	1	11	0	0	0	0	0	0	0	0	278
19:00	2	176	34	0	14	1	0	0	1	0	0	0	0	228
20:00	0	111	27	0	7	0	0	0	0	0	0	0	0	145
21:00	0	43	8	0	2	0	0	0	0	0	0	0	0	53
22:00	0	30	7	0	2	0	0	0	0	0	0	0	0	39
23:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
Day Total	72	3771	1142	59	411	34	38	20	9	11	0	0	4	5571
Percent	1.3%	67.7%	20.5%	1.1%	7.4%	0.6%	0.7%	0.4%	0.2%	0.2%	0.0%	0.0%	0.1%	
AM Peak	09:00	08:00	08:00	08:00	08:00	07:00	08:00	05:00	02:00	06:00			06:00	08:00
Vol.	8	342	99	17	44	4	6	4	1	3			1	520
PM Peak	12:00	15:00	16:00	15:00	12:00	12:00	12:00	13:00	16:00	12:00			12:00	15:00
Vol.	10	324	117	6	35	6	7	5	2	3			1	482

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/02/18	0	9	1	0	0	0	0	0	0	0	0	0	0	10
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	6	4	0	3	0	0	0	0	0	0	0	0	13
04:00	0	14	6	0	2	0	0	0	0	0	0	0	0	22
05:00	1	48	28	1	16	1	2	1	0	0	0	0	1	99
06:00	1	122	46	3	20	4	1	0	0	0	0	0	1	198
07:00	2	**349**	**92**	10	36	1	**7**	2	0	0	0	0	0	**499**
08:00	**6**	313	78	**17**	41	3	0	2	1	0	0	0	1	462
09:00	1	174	53	2	**45**	2	3	1	0	0	0	0	**2**	283
10:00	4	180	65	4	27	**5**	4	2	2	**3**	0	0	0	296
11:00	4	215	61	10	28	5	2	**4**	**3**	0	0	0	1	333
12 PM	4	287	69	3	26	**3**	**7**	1	**2**	**3**	0	0	**1**	406
13:00	2	217	57	1	28	1	4	2	1	1	0	0	1	315
14:00	**5**	228	88	4	38	2	0	0	1	0	0	0	1	367
15:00	4	305	**99**	**6**	**52**	2	2	**5**	0	0	0	0	0	**475**
16:00	1	**310**	99	3	49	1	0	1	2	0	0	0	0	466
17:00	0	278	93	2	38	1	0	0	0	0	0	0	0	412
18:00	2	273	86	2	33	0	0	0	0	0	0	0	0	396
19:00	1	145	45	0	19	1	0	2	0	0	0	0	0	213
20:00	0	108	27	2	31	0	0	0	0	0	0	0	0	168
21:00	0	49	10	0	6	0	0	0	0	0	0	0	0	65
22:00	0	28	6	0	5	1	0	0	0	0	0	0	0	40
23:00	0	22	5	0	3	0	0	0	0	0	0	0	0	30
Day Total	38	3687	1119	70	547	33	32	23	12	7	0	0	9	5577
Percent	0.7%	66.1%	20.1%	1.3%	9.8%	0.6%	0.6%	0.4%	0.2%	0.1%	0.0%	0.0%	0.2%	
AM Peak	08:00	07:00	07:00	08:00	09:00	10:00	07:00	11:00	11:00	10:00			09:00	07:00
Vol.	6	349	92	17	45	5	7	4	3	3			2	499
PM Peak	14:00	16:00	15:00	15:00	15:00	12:00	12:00	15:00	12:00	12:00			12:00	15:00
Vol.	5	310	99	6	52	3	7	5	2	3			1	475

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/03/18	0	7	2	0	3	0	0	0	0	0	0	0	0	12
01:00	0	9	1	1	0	0	0	0	0	0	0	0	0	11
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
03:00	0	6	4	0	4	0	0	0	0	0	0	0	0	14
04:00	0	8	8	1	6	0	0	0	0	0	0	0	0	23
05:00	1	46	16	0	20	1	1	0	0	0	0	0	0	85
06:00	2	120	35	2	28	1	3	1	1	2	0	0	0	195
07:00	2	**321**	**79**	9	**48**	0	0	0	2	0	0	0	0	**461**
08:00	1	293	67	**18**	48	**6**	**6**	2	1	1	0	0	**1**	444
09:00	**6**	199	61	3	36	3	1	3	**3**	2	0	0	0	317
10:00	4	180	66	5	37	1	2	1	2	**3**	0	0	1	302
11:00	3	228	65	4	41	4	5	**4**	1	0	0	0	0	355
12 PM	4	231	64	1	41	3	3	**6**	1	2	0	0	0	356
13:00	**14**	189	54	3	30	**5**	2	1	2	2	0	0	**1**	303
14:00	6	285	77	**6**	**62**	2	**4**	2	**4**	**3**	0	0	1	452
15:00	4	278	94	6	52	1	0	2	0	0	0	0	0	437
16:00	6	**314**	**109**	3	54	0	0	1	0	0	0	0	0	**487**
17:00	1	288	68	0	41	1	0	0	1	0	0	0	0	400
18:00	4	243	79	0	25	0	0	1	0	0	0	0	0	352
19:00	2	182	39	0	24	0	0	1	0	0	0	0	0	248
20:00	0	130	38	0	15	0	0	0	0	0	0	0	0	183
21:00	0	57	17	0	8	0	0	0	0	0	0	0	0	82
22:00	0	34	6	0	4	0	0	0	0	0	0	0	0	44
23:00	0	23	3	0	5	0	0	0	0	0	0	0	0	31
Day Total	60	3675	1053	62	632	28	27	25	18	15	0	0	4	5599
Percent	1.1%	65.6%	18.8%	1.1%	11.3%	0.5%	0.5%	0.4%	0.3%	0.3%	0.0%	0.0%	0.1%	
AM Peak	09:00	07:00	07:00	08:00	07:00	08:00	08:00	11:00	09:00	10:00			08:00	07:00
Vol.	6	321	79	18	48	6	6	4	3	3			1	461
PM Peak	13:00	16:00	16:00	14:00	14:00	13:00	14:00	12:00	14:00	14:00			13:00	16:00
Vol.	14	314	109	6	62	5	4	6	4	3			1	487

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/04/18	0	7	0	0	2	0	0	0	0	0	0	0	0	9
01:00	0	7	1	1	0	0	0	0	0	0	0	0	0	9
02:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
03:00	0	6	1	0	3	0	0	0	0	0	0	0	0	10
04:00	0	14	9	0	5	0	0	0	0	0	0	0	0	28
05:00	1	51	14	2	22	1	2	2	1	0	0	0	0	96
06:00	0	123	40	0	32	3	1	0	0	1	0	0	0	200
07:00	2	**321**	**91**	7	45	2	3	1	0	0	0	0	0	**472**
08:00	5	295	83	**12**	47	4	2	2	**2**	0	0	0	**1**	453
09:00	**11**	234	69	4	**64**	1	**6**	**4**	0	**2**	0	0	0	395
10:00	3	187	56	3	42	**5**	4	3	1	0	0	0	0	304
11:00	6	228	63	5	45	2	1	3	2	1	0	0	0	356
12 PM	4	261	73	1	39	**4**	**4**	0	0	0	0	0	0	386
13:00	3	208	70	4	40	4	0	**6**	**3**	**2**	0	0	0	340
14:00	**7**	285	78	**8**	52	0	3	1	2	1	0	0	**1**	438
15:00	2	246	**100**	7	38	4	2	1	0	2	0	0	0	402
16:00	3	**312**	91	3	**59**	1	0	3	1	0	0	0	0	**473**
17:00	2	266	69	0	40	1	0	0	0	0	0	0	0	378
18:00	0	214	66	1	30	0	0	0	0	0	0	0	0	311
19:00	1	146	49	0	16	0	0	0	0	0	0	0	0	212
20:00	0	105	30	0	14	0	0	0	0	0	0	0	0	149
21:00	0	47	11	1	3	0	0	0	0	0	0	0	0	62
22:00	0	35	7	0	5	0	0	0	0	0	0	0	0	47
23:00	0	21	6	0	2	0	0	0	0	0	0	0	0	29
Day Total	50	3631	1079	59	645	32	28	26	12	9	0	0	2	5573
Percent	0.9%	65.2%	19.4%	1.1%	11.6%	0.6%	0.5%	0.5%	0.2%	0.2%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	08:00	09:00	10:00	09:00	09:00	08:00	09:00			08:00	07:00
Vol.	11	321	91	12	64	5	6	4	2	2			1	472
PM Peak	14:00	16:00	15:00	14:00	16:00	12:00	12:00	13:00	13:00	13:00			14:00	16:00
Vol.	7	312	100	8	59	4	4	6	3	2			1	473

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/05/18	0	10	3	0	2	0	0	0	0	0	0	0	0	15
01:00	0	6	1	0	2	0	0	1	0	0	0	0	0	10
02:00	1	3	0	0	1	0	0	0	0	0	0	0	0	5
03:00	0	4	1	0	5	0	0	0	0	0	0	0	0	10
04:00	0	16	8	0	7	0	0	0	0	0	0	0	0	31
05:00	2	47	14	2	18	1	1	0	1	0	0	0	0	86
06:00	0	101	36	4	35	3	4	1	0	0	0	0	1	185
07:00	3	**312**	**82**	14	**54**	2	2	**3**	1	1	0	0	0	**474**
08:00	2	256	81	**16**	40	2	3	0	0	1	0	0	1	402
09:00	**6**	206	76	4	46	4	**7**	1	**2**	**2**	0	0	**2**	356
10:00	3	193	69	3	35	**8**	2	3	2	2	0	0	0	320
11:00	3	223	71	4	44	0	0	2	1	1	0	0	0	349
12 PM	**9**	263	90	**7**	52	2	**7**	**6**	0	1	0	0	0	437
13:00	5	225	84	2	41	**3**	5	2	2	**2**	0	0	**1**	372
14:00	6	**282**	85	4	**71**	1	6	3	**3**	1	0	0	0	**462**
15:00	4	271	**99**	6	66	1	1	0	1	0	0	0	0	449
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	44	2418	800	66	519	27	38	22	13	11	0	0	5	3963
Percent	1.1%	61.0%	20.2%	1.7%	13.1%	0.7%	1.0%	0.6%	0.3%	0.3%	0.0%	0.0%	0.1%	
AM Peak	09:00	07:00	07:00	08:00	07:00	10:00	09:00	07:00	09:00	09:00			09:00	07:00
Vol.	6	312	82	16	54	8	7	3	2	2			2	474
PM Peak	12:00	14:00	15:00	12:00	14:00	13:00	12:00	12:00	14:00	13:00			13:00	14:00
Vol.	9	282	99	7	71	3	7	6	3	2			1	462
Grand Total	352	23877	6986	343	3298	184	169	158	67	54	0	0	26	35514
Percent	1.0%	67.2%	19.7%	1.0%	9.3%	0.5%	0.5%	0.4%	0.2%	0.2%	0.0%	0.0%	0.1%	

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610-466-1469

Street: Greenbag Rd
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Weather: Clear
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	16	2	14	23	49	133	106	28	2	0	0	0	0	0	373	43	47
14:00	12	3	9	17	69	155	101	27	2	1	0	0	0	0	396	43	46
15:00	**29**	**6**	**17**	28	54	143	123	34	**6**	**3**	**1**	0	0	0	444	44	48
16:00	20	5	11	25	86	**213**	149	34	2	1	0	0	0	0	**546**	43	46
17:00	20	1	7	**31**	**96**	171	**172**	**38**	3	1	0	**1**	0	0	541	43	47
18:00	12	0	4	11	29	99	145	34	3	0	0	0	0	0	337	44	47
19:00	3	0	1	12	27	72	81	20	1	1	0	0	0	0	218	44	47
20:00	3	2	2	9	24	79	70	15	1	1	0	0	**1**	0	207	44	47
21:00	1	0	0	2	23	40	55	10	6	0	0	0	0	0	137	44	49
22:00	1	0	0	1	8	31	28	10	2	0	0	0	0	0	81	44	48
23:00	2	0	0	1	4	16	21	8	2	1	0	0	0	0	55	46	50
Total	119	19	65	160	469	1152	1051	258	30	9	1	1	1	0	3335		
Percent	3.6%	0.6%	1.9%	4.8%	14.1%	34.5%	31.5%	7.7%	0.9%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	15:00 29	15:00 6	15:00 17	17:00 31	17:00 96	16:00 213	17:00 172	17:00 38	15:00 6	15:00 3	15:00 1	17:00 1	20:00 1		16:00 546		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/29/18	0	0	0	0	1	12	11	5	1	1	0	0	0	0	31	47	52
01:00	1	0	0	0	0	6	2	5	0	0	0	0	**1**	0	15	48	71
02:00	0	0	0	1	2	6	5	1	1	0	0	0	0	0	16	44	50
03:00	0	0	0	0	0	4	4	4	1	0	0	0	0	0	13	48	51
04:00	0	0	0	0	0	3	1	3	0	0	0	0	0	0	7	48	49
05:00	0	0	0	0	1	5	5	2	1	0	0	0	0	0	14	47	51
06:00	0	0	2	0	4	8	12	8	1	0	0	0	0	0	35	47	49
07:00	1	0	0	0	3	20	26	23	4	0	0	0	0	0	77	48	50
08:00	2	1	1	3	7	31	49	29	**9**	**2**	0	0	0	0	134	48	52
09:00	7	**4**	5	12	18	66	65	30	3	2	0	0	0	0	212	45	49
10:00	7	1	4	8	27	**120**	87	**33**	7	0	0	0	0	0	294	44	48
11:00	**13**	2	**7**	**13**	**32**	119	**145**	29	8	1	**1**	0	0	0	**370**	44	48
12 PM	4	**1**	1	2	20	**102**	**113**	40	9	**2**	0	0	0	0	**294**	45	49
13:00	5	1	**7**	9	23	66	87	33	10	0	0	0	0	0	241	46	49
14:00	**8**	0	1	**10**	24	94	104	36	3	1	0	0	0	0	281	44	48
15:00	0	0	1	2	17	78	94	**48**	6	1	0	0	0	0	247	46	49
16:00	5	0	1	3	**26**	64	101	45	6	1	0	0	0	0	252	46	49
17:00	6	0	0	2	9	76	94	36	**12**	2	0	0	0	0	237	47	50
18:00	5	0	0	1	9	80	84	44	10	0	0	0	0	0	233	47	49
19:00	1	0	1	4	11	54	58	25	3	1	0	0	0	0	158	46	49
20:00	1	0	0	1	10	63	59	22	1	1	0	0	0	0	158	45	48
21:00	0	0	0	3	9	41	44	17	3	2	0	0	0	0	119	46	49
22:00	0	0	0	0	6	31	19	8	2	0	0	0	0	0	66	45	49
23:00	1	0	0	1	3	16	18	12	1	1	0	0	0	0	53	47	49
Total	67	10	31	75	262	1165	1287	538	102	18	1	0	1	0	3557		
Percent	1.9%	0.3%	0.9%	2.1%	7.4%	32.8%	36.2%	15.1%	2.9%	0.5%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	11:00	11:00	11:00	10:00	11:00	10:00	08:00	08:00	11:00		01:00		11:00		
Vol.	13	4	7	13	32	120	145	33	9	2	1		1		370		
PM Peak	14:00	12:00	13:00	14:00	16:00	12:00	12:00	15:00	17:00	12:00					12:00		
Vol.	8	1	7	10	26	102	113	48	12	2					294		

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Street: Greenbag Rd
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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/30/18	0	0	0	0	1	10	13	6	1	0	0	0	0	0	31	46	49
01:00	0	0	0	0	2	7	2	2	2	0	0	0	0	0	15	49	53
02:00	0	0	0	0	2	3	5	1	0	0	0	0	0	0	11	44	47
03:00	0	0	0	0	0	2	3	2	1	0	0	0	0	0	8	49	52
04:00	0	0	0	0	0	4	3	1	0	0	0	0	0	0	8	44	47
05:00	0	0	0	0	1	2	0	2	1	1	0	0	0	0	7	54	58
06:00	0	0	2	0	0	4	12	10	2	0	0	0	0	0	30	48	51
07:00	0	0	0	0	3	16	17	12	1	0	0	0	0	0	49	47	49
08:00	0	0	0	0	5	17	26	21	5	1	0	0	0	0	75	48	52
09:00	0	1	1	4	9	32	54	25	3	**2**	0	0	0	0	131	47	49
10:00	0	0	3	2	**14**	35	74	**39**	**9**	2	0	0	0	0	178	47	51
11:00	**2**	**4**	**7**	**6**	10	**62**	**89**	29	3	0	0	0	0	0	**212**	45	48
12 PM	6	**1**	**2**	1	19	96	107	39	3	1	**1**	0	0	0	276	45	48
13:00	2	0	0	0	22	**100**	**121**	35	8	**2**	0	0	0	0	**290**	45	49
14:00	**7**	1	2	**7**	14	87	115	33	4	1	0	0	0	0	271	44	48
15:00	4	0	1	1	11	87	105	42	7	2	0	0	0	0	260	46	49
16:00	2	1	1	6	**24**	94	108	41	5	1	1	0	0	0	284	45	49
17:00	1	0	1	3	20	78	105	**43**	5	1	0	0	0	0	257	46	49
18:00	5	0	0	3	12	57	78	24	**10**	0	0	0	0	0	189	46	50
19:00	3	0	0	1	11	46	64	34	2	1	0	0	0	0	162	46	49
20:00	2	0	0	3	23	46	55	26	4	0	0	0	0	0	159	46	49
21:00	0	0	0	0	7	24	23	13	4	0	0	0	0	0	71	47	50
22:00	0	0	0	2	4	9	17	7	0	1	0	0	0	0	40	46	49
23:00	0	0	0	0	1	6	5	12	1	0	0	0	0	0	25	48	49
Total	34	8	20	39	215	924	1201	499	81	16	2	0	0	0	3039		
Percent	1.1%	0.3%	0.7%	1.3%	7.1%	30.4%	39.5%	16.4%	2.7%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	10:00	11:00	11:00	10:00	10:00	09:00					11:00		
Vol.	2	4	7	6	14	62	89	39	9	2					212		
PM Peak	14:00	12:00	12:00	14:00	16:00	13:00	13:00	17:00	18:00	13:00	12:00				13:00		
Vol.	7	1	2	7	24	100	121	43	10	2	1				290		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/01/18	0	0	2	0	2	1	5	3	1	0	0	0	0	0	14	48	51
01:00	0	0	0	0	0	5	4	4	0	0	0	0	0	0	13	47	49
02:00	0	0	0	0	0	2	4	0	1	0	0	0	0	0	7	44	53
03:00	0	0	0	0	0	2	3	0	0	0	0	0	0	0	5	43	44
04:00	0	0	0	0	1	3	10	4	0	0	0	0	0	0	18	46	48
05:00	1	0	1	0	1	15	24	12	4	1	0	0	0	0	59	48	52
06:00	7	2	**11**	5	17	57	67	18	3	**3**	0	0	0	0	190	44	49
07:00	12	1	1	**19**	**61**	**125**	**119**	**42**	5	0	0	0	0	0	**385**	44	48
08:00	**22**	**9**	10	14	22	88	98	27	**7**	1	0	0	0	0	298	44	48
09:00	12	2	6	8	25	62	77	24	6	1	0	0	0	0	223	44	49
10:00	21	0	2	19	30	84	65	23	4	1	0	0	0	0	249	44	48
11:00	8	0	2	14	47	112	103	29	5	0	0	0	0	0	320	44	48
12 PM	19	1	5	19	62	156	116	26	8	**3**	**1**	0	0	0	416	43	48
13:00	18	2	6	16	79	126	101	33	6	1	0	0	0	0	388	44	48
14:00	**32**	5	9	11	34	129	144	31	5	0	1	0	0	0	401	44	47
15:00	21	**7**	11	3	52	161	134	44	3	0	0	0	0	0	436	44	47
16:00	17	0	7	**23**	64	150	168	49	**9**	1	0	0	0	0	488	44	48
17:00	27	1	**12**	18	**91**	**247**	**170**	37	3	0	0	0	0	0	**606**	43	46
18:00	8	0	1	6	23	109	166	**52**	8	0	0	0	0	0	373	45	48
19:00	8	0	3	2	36	109	89	30	1	0	0	0	0	0	278	44	47
20:00	2	0	0	2	16	61	60	25	2	0	0	0	0	0	168	45	48
21:00	1	0	0	0	8	21	42	21	6	0	0	0	0	0	99	47	50
22:00	0	0	0	0	1	11	23	7	2	0	0	0	0	0	44	46	49
23:00	0	0	0	0	1	6	13	15	3	1	0	0	0	0	39	49	53
Total	236	30	89	179	673	1842	1805	556	92	13	2	0	0	0	5517		
Percent	4.3%	0.5%	1.6%	3.2%	12.2%	33.4%	32.7%	10.1%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	06:00	07:00	07:00	07:00	07:00	07:00	08:00	06:00					07:00		
Vol.	22	9	11	19	61	125	119	42	7	3					385		
PM Peak	14:00	15:00	17:00	16:00	17:00	17:00	17:00	18:00	16:00	12:00	12:00				17:00		
Vol.	32	7	12	23	91	247	170	52	9	3	1				606		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/02/18	0	0	1	0	2	2	13	1	2	0	0	0	0	0	21	44	52
01:00	0	0	0	0	1	3	1	2	1	0	0	0	0	0	8	49	52
02:00	0	0	0	0	0	1	1	1	1	0	0	0	0	0	4	52	54
03:00	0	0	0	0	0	1	1	1	0	0	0	0	0	0	3	47	49
04:00	1	0	0	0	0	3	4	4	0	0	0	0	0	0	12	47	49
05:00	2	0	0	0	5	14	24	11	5	0	0	0	0	0	61	48	51
06:00	4	1	1	8	22	64	55	33	**11**	0	**1**	0	0	0	200	47	50
07:00	**25**	2	**14**	**19**	**70**	**153**	114	31	2	**1**	0	0	0	0	**431**	43	47
08:00	16	**6**	11	5	12	60	93	**37**	10	0	0	0	0	0	250	46	49
09:00	7	2	5	7	35	79	68	26	4	0	0	0	0	0	233	44	48
10:00	10	5	1	9	45	65	71	25	1	1	0	0	0	0	233	44	48
11:00	10	2	3	9	43	127	**122**	21	5	0	0	0	0	0	342	43	47
12 PM	21	0	5	10	79	149	106	32	7	1	0	0	0	0	410	43	48
13:00	18	1	5	14	50	131	111	30	2	0	0	0	0	0	362	43	47
14:00	19	2	10	15	50	119	103	36	5	0	0	0	0	0	359	44	48
15:00	17	3	7	21	49	157	140	45	7	**2**	0	0	0	0	448	44	48
16:00	16	0	4	19	74	192	175	45	7	1	0	0	0	0	533	44	47
17:00	**28**	**6**	**11**	**37**	**103**	**210**	**216**	40	8	1	**1**	0	0	0	**661**	43	47
18:00	16	1	2	2	36	107	146	**56**	**13**	0	1	0	0	0	380	46	49
19:00	2	0	1	2	17	85	114	28	2	0	0	0	0	0	251	44	48
20:00	4	0	0	4	12	53	53	21	5	1	0	0	0	0	153	45	49
21:00	0	0	0	2	9	28	39	14	3	0	0	0	0	0	95	45	49
22:00	2	0	0	0	5	10	32	8	3	0	0	0	0	0	60	46	49
23:00	0	0	0	1	1	15	9	9	3	0	0	0	0	0	38	48	51
Total	218	31	81	184	720	1828	1811	557	107	8	3	0	0	0	5548		
Percent	3.9%	0.6%	1.5%	3.3%	13.0%	32.9%	32.6%	10.0%	1.9%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	07:00	07:00	07:00	07:00	11:00	08:00	06:00	07:00	06:00				07:00		
Vol.	25	6	14	19	70	153	122	37	11	1	1				431		
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	17:00	18:00	18:00	15:00	17:00				17:00		
Vol.	28	6	11	37	103	210	216	56	13	2	1				661		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
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Weather: Clear
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/03/18	0	0	0	1	4	3	8	2	2	0	0	0	0	0	20	47	52
01:00	0	0	0	0	1	5	1	3	1	0	0	0	0	0	11	48	52
02:00	0	0	0	0	0	5	2	4	0	0	0	0	0	0	11	47	49
03:00	1	0	0	0	1	1	0	1	0	0	0	0	0	0	4	47	49
04:00	2	0	0	1	1	4	6	1	1	0	0	0	0	0	16	44	50
05:00	2	0	0	0	7	13	21	5	4	0	0	0	0	0	52	46	51
06:00	9	0	0	3	24	59	56	25	**9**	0	0	0	0	0	185	46	49
07:00	12	0	0	**15**	43	**154**	**147**	28	7	**3**	0	0	0	0	**409**	44	48
08:00	**22**	0	**21**	6	44	93	80	28	3	2	0	0	0	0	299	44	48
09:00	16	0	10	11	29	78	77	16	8	0	0	0	0	0	245	44	48
10:00	4	0	5	8	**47**	87	89	25	6	1	0	0	0	0	272	44	48
11:00	12	**5**	5	6	33	112	104	**45**	7	0	**1**	0	0	0	330	45	49
12 PM	25	6	**13**	15	40	118	118	31	5	1	0	0	0	0	372	44	47
13:00	17	6	7	19	32	116	105	39	7	1	0	0	0	0	349	44	48
14:00	25	3	5	18	38	127	124	31	2	**2**	0	0	0	0	375	44	47
15:00	13	**8**	13	16	44	114	140	48	6	2	0	0	0	0	404	44	48
16:00	**27**	1	6	**20**	67	206	173	**59**	7	1	**1**	0	0	0	568	44	48
17:00	20	2	3	9	**76**	**221**	**198**	52	7	1	0	0	0	0	**589**	44	47
18:00	11	1	1	3	28	125	159	55	**14**	0	0	**1**	0	0	398	45	49
19:00	6	1	0	3	15	82	110	42	3	2	1	0	0	0	265	45	49
20:00	2	0	0	2	9	63	91	29	2	0	0	0	0	0	198	45	48
21:00	1	0	0	0	3	32	38	25	2	0	0	0	0	0	101	47	49
22:00	1	0	0	1	2	17	28	11	7	2	0	0	0	0	69	49	53
23:00	0	0	0	1	1	5	19	9	1	1	0	0	0	0	37	48	50
Total	228	33	89	158	589	1840	1894	614	111	19	3	1	0	0	5579		
Percent	4.1%	0.6%	1.6%	2.8%	10.6%	33.0%	33.9%	11.0%	2.0%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	08:00	07:00	10:00	07:00	07:00	11:00	06:00	07:00	11:00				07:00		
Vol.	22	5	21	15	47	154	147	45	9	3	1				409		
PM Peak	16:00	15:00	12:00	16:00	17:00	17:00	17:00	16:00	18:00	14:00	16:00	18:00			17:00		
Vol.	27	8	13	20	76	221	198	59	14	2	1	1			589		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/04/18	0	0	1	0	2	5	11	6	1	1	0	0	0	0	27	48	53
01:00	0	0	0	0	0	3	7	5	0	3	0	0	0	0	18	55	58
02:00	0	0	0	0	0	2	2	2	2	0	0	0	0	**1**	9	52	54
03:00	0	0	0	0	0	2	0	1	0	0	0	0	0	0	3	47	49
04:00	0	0	0	0	2	4	7	5	0	0	0	0	0	0	18	47	49
05:00	1	0	0	1	1	8	20	15	4	1	0	0	0	0	51	49	53
06:00	4	0	1	2	16	60	63	29	**6**	2	0	0	0	0	183	46	49
07:00	12	3	3	8	**59**	**144**	**151**	40	2	1	0	0	0	0	**423**	44	47
08:00	**22**	**6**	**10**	15	35	70	78	**41**	3	**5**	0	0	0	0	285	45	49
09:00	9	0	4	5	29	78	74	38	3	1	0	0	0	0	241	45	48
10:00	6	2	6	**20**	24	109	88	39	4	0	0	0	0	0	298	44	48
11:00	11	2	7	17	44	121	125	15	2	2	**1**	0	0	0	347	43	45
12 PM	13	0	4	10	59	143	135	39	10	0	0	0	0	0	413	44	48
13:00	11	1	5	10	67	137	96	32	3	1	0	0	0	0	363	44	47
14:00	**21**	5	11	**24**	45	127	127	37	7	0	0	0	**1**	0	405	44	48
15:00	19	**9**	7	3	47	123	137	**51**	**13**	0	0	0	0	**1**	410	45	49
16:00	19	1	**16**	20	48	160	188	51	7	1	0	0	0	1	512	44	48
17:00	19	0	3	23	**80**	**220**	**202**	51	4	**3**	0	0	0	0	**605**	44	47
18:00	11	0	0	3	49	126	116	41	7	0	0	0	0	1	354	44	48
19:00	6	0	3	14	40	83	75	19	4	0	0	0	1	0	245	44	48
20:00	0	0	0	4	36	56	53	7	0	0	0	0	0	0	156	43	44
21:00	2	0	0	3	8	24	31	13	0	0	0	0	0	0	81	45	48
22:00	0	0	0	1	5	20	22	14	4	0	0	0	0	0	66	47	50
23:00	0	0	0	0	3	15	22	14	2	0	0	0	0	0	56	47	49
Total	186	29	81	183	699	1840	1830	605	88	21	1	0	2	4	5569		
Percent	3.3%	0.5%	1.5%	3.3%	12.6%	33.0%	32.9%	10.9%	1.6%	0.4%	0.0%	0.0%	0.0%	0.1%			
AM Peak	08:00	08:00	08:00	10:00	07:00	07:00	07:00	08:00	06:00	08:00	11:00			02:00	07:00		
Vol.	22	6	10	20	59	144	151	41	6	5	1			1	423		
PM Peak	14:00	15:00	16:00	14:00	17:00	17:00	17:00	15:00	15:00	17:00			14:00	15:00	17:00		
Vol.	21	9	16	24	80	220	202	51	13	3			1	1	605		

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/05/18	0	0	0	0	0	6	10	3	2	0	0	0	0	0	21	48	52
01:00	0	0	0	0	4	2	7	2	2	0	0	0	0	0	17	48	52
02:00	0	0	0	0	1	3	3	3	2	0	0	0	0	0	12	50	53
03:00	0	0	0	0	0	2	4	1	1	1	0	0	0	0	9	53	57
04:00	0	0	0	0	0	4	5	4	0	0	0	0	0	0	13	47	49
05:00	0	0	0	2	1	11	19	10	4	0	0	0	0	0	47	48	52
06:00	12	1	3	2	11	52	64	40	4	1	0	0	0	0	190	47	49
07:00	**19**	0	1	6	40	**137**	**142**	**70**	5	0	0	0	0	0	**420**	45	48
08:00	12	1	4	7	25	59	97	42	**9**	**3**	**1**	0	0	0	260	46	50
09:00	12	0	4	**12**	35	68	86	31	3	1	0	0	0	0	252	44	48
10:00	16	**4**	4	6	38	92	73	27	7	0	0	0	0	0	267	44	48
11:00	9	0	**6**	3	**51**	132	138	44	1	0	0	0	0	0	384	44	47
12 PM	13	5	3	7	42	137	135	30	2	**2**	0	0	0	0	376	44	47
13:00	20	2	**9**	**20**	50	129	116	42	4	0	0	0	0	0	392	44	48
14:00	16	2	6	13	**57**	115	140	43	8	1	0	0	0	0	401	44	48
15:00	18	1	3	7	44	**161**	**179**	**62**	**10**	1	0	0	0	0	**486**	45	48
16:00	**31**	**12**	2	13	23	37	31	4	0	0	**1**	0	0	0	154	42	44
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	178	28	45	98	422	1147	1249	458	64	10	2	0	0	0	3701		
Percent	4.8%	0.8%	1.2%	2.6%	11.4%	31.0%	33.7%	12.4%	1.7%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	11:00	09:00	11:00	07:00	07:00	07:00	08:00	08:00	08:00				07:00		
Vol.	19	4	6	12	51	137	142	70	9	3	1				420		
PM Peak	16:00	16:00	13:00	13:00	14:00	15:00	15:00	15:00	15:00	12:00	16:00				15:00		
Vol.	31	12	9	20	57	161	179	62	10	2	1				486		

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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/07/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/08/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/09/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	
Total	1266	188	501	1076	4049	11738	12128	4085	675	114	15	2	4	4	35845		
Percent	3.5%	0.5%	1.4%	3.0%	11.3%	32.7%	33.8%	11.4%	1.9%	0.3%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	32 MPH
	50th Percentile :	39 MPH
	85th Percentile :	44 MPH
	95th Percentile :	48 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	23866
	Percent in Pace :	66.6%
	Number of Vehicles > 55 MPH :	139
	Percent of Vehicles > 55 MPH :	0.4%
	Mean Speed(Average) :	39 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	28	2	**12**	10	36	103	136	45	6	**2**	0	0	0	0	380	44	48
14:00	22	**3**	6	8	45	117	136	58	**15**	1	0	0	0	0	411	46	49
15:00	**30**	1	4	12	46	128	160	**64**	4	0	0	0	0	0	449	45	48
16:00	27	0	4	**14**	**69**	**153**	**161**	46	3	0	0	0	0	0	**477**	44	47
17:00	17	0	5	2	33	136	146	52	5	1	0	0	0	0	397	44	48
18:00	15	0	0	7	22	81	125	50	7	1	0	0	0	0	308	46	49
19:00	11	0	0	9	17	69	55	27	3	1	0	0	0	0	192	45	48
20:00	5	0	2	2	21	66	33	15	1	0	0	0	0	0	145	44	47
21:00	0	0	0	9	16	42	32	22	3	0	0	0	0	0	124	46	49
22:00	1	0	0	3	12	21	25	10	4	0	0	**1**	0	0	77	46	51
23:00	0	0	1	0	8	11	16	5	1	0	0	0	0	0	42	44	48
Total	156	6	34	76	325	927	1025	394	52	6	0	1	0	0	3002		
Percent	5.2%	0.2%	1.1%	2.5%	10.8%	30.9%	34.1%	13.1%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	15:00 30	14:00 3	13:00 12	16:00 14	16:00 69	16:00 153	16:00 161	15:00 64	14:00 15	13:00 2		22:00 1			16:00 477		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/29/18	0	0	0	5	9	12	14	2	2	0	0	0	0	0	44	44	49
01:00	1	1	0	1	5	3	4	3	1	1	0	0	0	0	20	48	55
02:00	0	0	0	1	0	3	3	6	1	0	0	0	0	0	14	49	51
03:00	0	0	0	0	0	3	5	4	0	0	0	0	0	0	12	47	49
04:00	0	0	0	0	1	7	6	1	1	0	0	0	0	0	16	44	50
05:00	0	0	0	2	11	3	20	9	2	1	0	0	0	0	48	47	51
06:00	0	0	0	1	4	12	24	15	2	0	0	**1**	0	0	59	48	50
07:00	1	0	0	0	5	19	49	22	4	**2**	**1**	0	0	0	103	48	52
08:00	3	0	1	1	11	42	82	46	2	2	0	0	0	0	190	47	49
09:00	11	**2**	**7**	4	**25**	**80**	73	35	5	0	1	0	0	0	243	45	49
10:00	11	0	6	**15**	24	70	100	**52**	**10**	1	0	0	0	0	**289**	46	49
11:00	**14**	2	7	6	19	56	**102**	45	6	0	0	0	0	0	257	46	49
12 PM	**10**	**2**	2	3	16	66	91	50	9	1	0	0	0	0	250	47	49
13:00	8	0	**5**	**5**	17	75	98	38	11	1	0	0	0	0	258	46	49
14:00	9	1	2	4	**29**	**78**	90	43	6	0	0	0	0	0	262	46	49
15:00	5	0	1	5	27	78	81	29	**16**	1	**1**	0	0	0	244	46	51
16:00	6	0	2	5	19	59	**117**	**53**	8	1	0	0	0	0	**270**	47	49
17:00	8	0	1	2	18	68	81	42	2	1	0	0	0	0	223	46	49
18:00	6	0	0	0	6	33	79	28	7	**4**	0	0	0	0	163	47	52
19:00	2	0	1	1	12	54	60	22	6	0	1	0	0	0	159	46	49
20:00	1	0	0	5	15	40	36	20	1	0	0	0	0	0	118	45	48
21:00	1	0	0	0	7	25	24	3	2	1	0	0	0	0	63	44	49
22:00	0	0	0	0	15	24	21	9	1	0	0	0	0	0	70	44	48
23:00	0	0	0	2	4	14	11	6	0	0	0	0	0	0	37	45	48
Total	97	8	35	68	299	924	1271	583	105	17	4	1	0	0	3412		
Percent	2.8%	0.2%	1.0%	2.0%	8.8%	27.1%	37.3%	17.1%	3.1%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	09:00	10:00	09:00	09:00	11:00	10:00	10:00	07:00	07:00	06:00			10:00		
Vol.	14	2	7	15	25	80	102	52	10	2	1	1			289		
PM Peak	12:00	12:00	13:00	13:00	14:00	14:00	16:00	16:00	15:00	18:00	15:00				16:00		
Vol.	10	2	5	5	29	78	117	53	16	4	1				270		

Tri-State Traffic Data, Inc.

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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
09/30/18	0	0	0	0	4	6	8	3	4	0	0	0	0	0	25	50	53
01:00	0	0	0	0	2	5	3	3	0	0	0	0	0	0	13	46	48
02:00	0	0	0	1	1	2	2	0	0	0	0	0	0	0	6	42	44
03:00	0	0	0	0	0	5	5	2	0	0	0	0	0	0	12	45	48
04:00	0	0	0	0	0	3	2	2	1	1	0	0	0	0	9	53	57
05:00	0	0	0	0	1	2	14	6	2	0	**1**	0	0	0	26	49	54
06:00	1	0	0	1	0	15	20	6	4	0	0	0	0	0	47	47	52
07:00	0	0	0	1	5	26	19	15	6	0	0	0	0	0	72	48	51
08:00	0	0	1	1	3	27	35	13	4	0	0	0	0	0	84	46	49
09:00	2	0	1	1	**12**	35	40	31	**7**	1	1	0	0	0	131	48	51
10:00	1	0	**6**	**2**	8	40	**86**	37	7	**2**	0	0	0	0	189	47	49
11:00	**5**	**1**	2	2	7	**57**	83	**52**	7	2	0	0	0	0	**218**	47	49
12 PM	10	**2**	**2**	3	18	67	**130**	44	6	1	0	0	0	0	283	45	49
13:00	6	0	0	0	**25**	68	127	**51**	8	2	0	0	0	0	**287**	46	49
14:00	**13**	0	1	3	14	62	97	48	**13**	2	0	0	0	0	253	47	50
15:00	5	0	0	1	13	67	99	45	9	1	0	0	0	0	240	47	49
16:00	5	0	1	**4**	12	**85**	93	49	11	**3**	0	0	0	0	263	47	50
17:00	7	0	1	4	8	54	90	40	7	1	0	0	0	0	212	47	49
18:00	4	0	0	1	11	51	60	29	2	1	0	0	0	0	159	46	49
19:00	2	0	1	1	9	31	58	11	4	0	0	0	0	0	117	44	49
20:00	2	0	0	2	8	35	31	17	3	1	0	0	0	0	99	46	49
21:00	0	0	0	1	8	18	12	9	3	0	**1**	0	0	0	52	47	52
22:00	0	0	0	0	0	13	9	4	4	0	1	0	0	0	31	50	54
23:00	0	0	0	0	1	7	9	1	0	0	0	0	0	0	18	44	45
Total	63	3	16	29	170	781	1132	518	112	18	4	0	0	0	2846		
Percent	2.2%	0.1%	0.6%	1.0%	6.0%	27.4%	39.8%	18.2%	3.9%	0.6%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	10:00	09:00	11:00	10:00	11:00	09:00	10:00	05:00				11:00		
Vol.	5	1	6	2	12	57	86	52	7	2	1				218		
PM Peak	14:00	12:00	12:00	16:00	13:00	16:00	12:00	13:00	14:00	16:00	21:00				13:00		
Vol.	13	2	2	4	25	85	130	51	13	3	1				287		

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/01/18	0	0	0	0	1	1	1	1	0	0	0	0	0	0	4	47	49
01:00	0	0	0	0	0	1	4	1	0	0	0	0	0	0	6	45	48
02:00	0	0	0	0	0	1	1	3	1	0	0	0	0	0	6	50	53
03:00	0	0	0	0	3	4	4	3	0	0	0	0	0	0	14	46	48
04:00	0	0	0	0	1	5	10	6	1	0	0	0	0	0	23	47	49
05:00	1	0	0	2	5	20	39	19	**7**	0	0	0	0	0	93	48	51
06:00	8	0	1	4	22	61	78	41	4	1	0	0	0	0	220	46	49
07:00	25	0	1	5	48	**178**	**158**	**57**	6	1	0	0	0	0	479	44	48
08:00	**32**	**7**	**28**	**38**	**69**	152	146	41	6	1	0	0	0	0	**520**	43	47
09:00	21	0	5	19	49	96	87	28	6	**2**	0	0	0	0	313	44	48
10:00	15	2	4	9	27	84	85	23	6	1	0	0	0	0	256	44	48
11:00	26	3	5	12	31	105	97	38	4	1	0	0	0	0	322	44	48
12 PM	33	2	4	15	54	134	122	32	2	**2**	0	0	0	0	400	44	47
13:00	16	**3**	4	**18**	39	120	101	33	2	2	0	0	0	0	338	44	48
14:00	33	0	4	13	**64**	162	132	39	3	0	0	0	0	0	450	44	47
15:00	18	2	3	9	56	159	**170**	62	4	0	0	0	0	0	**483**	44	48
16:00	22	1	**6**	11	30	**164**	145	**63**	**7**	0	0	0	0	0	449	45	48
17:00	**37**	1	6	12	45	158	137	41	4	1	0	0	0	0	442	44	47
18:00	12	0	1	3	28	101	94	39	1	0	0	0	0	0	279	44	48
19:00	7	0	3	7	36	85	69	21	1	0	0	0	0	0	229	44	47
20:00	5	0	0	2	7	48	55	24	4	0	0	0	0	0	145	46	49
21:00	0	0	0	0	3	24	14	8	2	2	0	0	0	0	53	47	53
22:00	0	0	0	2	6	8	14	4	4	1	0	0	0	0	39	48	53
23:00	0	0	0	0	1	6	10	4	0	0	**1**	0	0	0	22	47	49
Total	311	21	75	181	625	1877	1773	631	75	15	1	0	0	0	5585		
Percent	5.6%	0.4%	1.3%	3.2%	11.2%	33.6%	31.7%	11.3%	1.3%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00	07:00	07:00	05:00	09:00					08:00		
Vol.	32	7	28	38	69	178	158	57	7	2					520		
PM Peak	17:00	13:00	16:00	13:00	14:00	16:00	15:00	16:00	16:00	12:00	23:00				15:00		
Vol.	37	3	6	18	64	164	170	63	7	2	1				483		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/02/18	0	0	0	2	1	3	1	1	1	1	0	0	0	0	10	52	57
01:00	0	0	0	0	0	2	2	1	0	0	0	0	0	0	5	46	48
02:00	0	0	0	0	2	1	1	0	0	0	0	0	0	0	4	42	43
03:00	0	0	0	0	0	6	3	3	1	0	0	0	0	0	13	48	51
04:00	1	0	0	1	0	5	7	6	1	0	**1**	0	0	0	22	48	54
05:00	3	0	0	1	5	24	37	24	3	2	0	0	0	0	99	47	50
06:00	5	0	2	3	11	70	75	30	3	0	0	0	0	0	199	45	48
07:00	**37**	**6**	3	12	**54**	**169**	**177**	36	**6**	0	0	0	0	0	**500**	44	47
08:00	20	3	9	**26**	31	153	174	**44**	3	0	0	0	0	0	463	44	47
09:00	10	0	7	12	47	88	79	35	6	0	0	0	0	0	284	44	48
10:00	15	3	**11**	9	46	99	76	29	6	**3**	0	0	0	0	297	44	48
11:00	16	2	5	11	48	114	95	38	5	0	0	0	0	0	334	44	48
12 PM	22	3	10	**15**	**70**	137	102	45	2	0	0	0	0	0	406	44	47
13:00	16	4	6	13	33	98	120	24	4	0	0	0	0	0	318	44	47
14:00	19	**7**	**14**	9	41	100	125	47	7	1	0	0	0	0	370	44	48
15:00	28	3	6	12	60	122	171	59	10	**2**	0	0	0	0	**473**	45	49
16:00	27	1	2	6	36	**150**	**175**	**64**	6	0	0	0	0	0	467	44	48
17:00	**39**	1	3	10	41	117	133	58	8	2	0	0	0	0	412	45	49
18:00	30	0	2	5	35	121	141	48	**14**	2	0	0	0	0	398	45	49
19:00	8	0	0	4	14	81	81	23	5	1	0	0	0	0	217	44	48
20:00	8	0	3	2	21	70	41	20	5	0	0	0	0	0	170	44	49
21:00	2	0	0	1	3	21	22	8	6	2	0	0	0	0	65	48	53
22:00	1	0	0	0	4	12	13	7	3	0	0	0	0	0	40	47	51
23:00	0	0	0	1	2	8	8	10	1	0	0	0	0	0	30	48	49
Total	307	33	83	155	605	1771	1859	660	106	16	1	0	0	0	5596		
Percent	5.5%	0.6%	1.5%	2.8%	10.8%	31.6%	33.2%	11.8%	1.9%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	10:00	08:00	07:00	07:00	07:00	08:00	07:00	10:00	04:00				07:00		
Vol.	37	6	11	26	54	169	177	44	6	3	1				500		
PM Peak	17:00	14:00	14:00	12:00	12:00	16:00	16:00	16:00	18:00	15:00					15:00		
Vol.	39	7	14	15	70	150	175	64	14	2					473		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/03/18	0	0	0	0	3	3	3	1	0	**2**	0	0	0	0	12	55	58
01:00	0	0	0	0	2	5	1	2	1	0	0	0	0	0	11	48	52
02:00	0	0	0	0	1	1	2	0	0	1	0	0	0	0	5	56	58
03:00	0	0	0	0	3	3	7	1	0	0	0	0	0	0	14	44	46
04:00	0	0	0	1	0	6	9	5	2	0	0	0	0	0	23	48	52
05:00	1	1	0	2	3	25	33	18	2	0	0	0	0	0	85	47	49
06:00	7	0	5	7	19	58	70	24	3	2	0	0	0	0	195	44	49
07:00	22	0	1	10	55	**172**	**142**	**47**	**12**	1	**1**	0	0	0	**463**	44	49
08:00	**23**	2	7	**24**	**63**	159	128	35	5	0	0	0	0	0	446	43	47
09:00	14	**10**	8	15	42	112	89	24	4	0	0	0	0	0	318	43	47
10:00	19	4	9	17	39	106	86	20	4	1	0	0	0	0	305	43	47
11:00	20	10	**11**	13	32	119	111	34	7	0	0	0	0	0	357	44	48
12 PM	25	6	3	10	44	112	117	39	1	0	0	0	0	0	357	44	47
13:00	17	**13**	9	20	42	91	82	27	1	1	0	0	0	0	303	43	47
14:00	**33**	7	**13**	**34**	**53**	121	138	43	8	0	1	0	0	0	451	44	48
15:00	25	0	3	19	28	136	152	64	**12**	0	0	0	0	0	439	45	49
16:00	32	0	1	13	35	**163**	**167**	**65**	11	1	0	0	0	0	**488**	45	49
17:00	32	1	2	11	26	121	153	46	9	0	0	0	0	0	401	44	48
18:00	23	0	2	1	25	83	152	60	5	**2**	0	0	0	0	353	46	49
19:00	6	0	0	2	20	70	99	44	7	0	0	0	0	0	248	46	49
20:00	3	0	0	0	11	54	80	30	5	1	0	0	0	0	184	46	49
21:00	1	0	0	1	5	20	33	14	4	2	**2**	0	0	0	82	48	54
22:00	1	0	0	0	1	16	14	10	2	0	0	0	0	0	44	47	49
23:00	0	0	0	0	3	10	10	7	1	0	0	0	0	0	31	47	49
Total	304	54	74	200	555	1766	1878	660	106	14	4	0	0	0	5615		
Percent	5.4%	1.0%	1.3%	3.6%	9.9%	31.5%	33.4%	11.8%	1.9%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	09:00	11:00	08:00	08:00	07:00	07:00	07:00	07:00	00:00	07:00				07:00		
Vol.	23	10	11	24	63	172	142	47	12	2	1				463		
PM Peak	14:00	13:00	14:00	14:00	14:00	16:00	16:00	16:00	15:00	18:00	21:00				16:00		
Vol.	33	13	13	34	53	163	167	65	12	2	2				488		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/04/18	0	0	0	0	1	5	1	0	2	0	0	0	0	0	9	51	53
01:00	0	0	0	0	1	1	3	3	0	1	0	0	0	0	9	49	57
02:00	0	0	2	0	0	3	3	3	2	0	**1**	0	0	0	14	52	61
03:00	0	0	0	0	1	6	1	0	1	1	0	0	0	0	10	52	57
04:00	0	0	0	0	1	5	9	6	6	0	1	0	0	0	28	52	54
05:00	1	0	2	0	2	22	34	25	8	2	0	0	0	0	96	49	53
06:00	8	0	0	4	15	40	69	45	**17**	2	0	0	0	0	200	48	52
07:00	**29**	1	12	10	44	142	**148**	**77**	7	0	0	0	0	0	**470**	45	48
08:00	25	**2**	**15**	**23**	**51**	120	142	70	6	0	0	0	0	0	454	45	48
09:00	17	1	8	18	36	**148**	117	42	8	0	0	0	0	0	395	44	48
10:00	17	0	5	12	28	97	96	41	7	2	0	0	0	0	305	45	49
11:00	20	2	10	18	31	98	126	41	9	**3**	0	0	0	0	358	44	49
12 PM	20	0	6	9	43	**133**	134	35	6	1	0	0	0	0	387	44	48
13:00	19	1	10	9	36	92	130	39	4	0	0	0	0	0	340	44	48
14:00	30	**23**	**17**	10	45	104	130	63	13	**3**	**1**	0	0	0	439	46	49
15:00	12	3	1	**15**	**64**	101	122	72	10	3	1	0	0	0	404	46	49
16:00	**31**	0	2	9	38	128	**176**	**73**	**15**	3	0	0	0	0	**475**	46	49
17:00	30	0	1	6	25	116	133	54	12	2	0	0	0	0	379	46	49
18:00	22	0	2	6	22	113	99	41	9	0	0	0	0	0	314	45	49
19:00	12	0	2	4	41	72	63	19	2	0	0	0	0	0	215	44	47
20:00	1	0	1	5	29	57	46	10	0	0	0	0	0	0	149	43	46
21:00	1	0	0	2	7	24	16	9	3	0	0	0	0	0	62	46	49
22:00	0	0	0	1	4	18	18	3	3	0	0	0	0	0	47	44	51
23:00	0	0	0	0	3	4	14	7	1	0	0	0	0	0	29	47	49
Total	295	33	96	161	568	1649	1830	778	151	23	4	0	0	0	5588		
Percent	5.3%	0.6%	1.7%	2.9%	10.2%	29.5%	32.7%	13.9%	2.7%	0.4%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	08:00	09:00	07:00	07:00	06:00	11:00	02:00				07:00		
Vol.	29	2	15	23	51	148	148	77	17	3	1				470		
PM Peak	16:00	14:00	14:00	15:00	15:00	12:00	16:00	16:00	16:00	14:00	14:00				16:00		
Vol.	31	23	17	15	64	133	176	73	15	3	1				475		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/05/18	0	0	0	0	1	3	7	4	0	0	0	0	0	0	15	47	49
01:00	0	0	0	0	1	7	0	2	0	0	0	0	0	0	10	46	48
02:00	1	1	0	1	1	0	0	1	0	0	0	0	0	0	5	46	48
03:00	0	0	0	0	0	4	2	2	2	0	0	0	0	0	10	51	53
04:00	0	0	0	0	1	7	8	8	4	2	**1**	0	0	0	31	52	58
05:00	3	1	0	2	3	23	25	22	7	1	0	0	0	0	87	48	52
06:00	11	0	2	3	19	49	64	30	8	1	0	0	0	0	187	46	49
07:00	**29**	0	1	14	48	**144**	**165**	**60**	**12**	2	0	0	0	0	**475**	45	49
08:00	12	2	4	14	42	113	152	56	6	**3**	0	0	0	0	404	45	49
09:00	24	**3**	**14**	16	**58**	118	86	33	5	0	0	0	0	0	357	44	48
10:00	15	0	3	**20**	28	110	111	32	1	0	1	0	0	0	321	44	47
11:00	16	0	3	9	26	110	126	51	6	2	0	0	0	0	349	45	49
12 PM	24	**7**	**16**	**26**	45	127	131	49	12	0	0	0	0	0	437	44	48
13:00	**32**	5	14	14	21	90	107	68	**21**	2	0	0	0	0	374	47	51
14:00	29	2	15	11	**56**	**130**	145	59	13	**3**	0	0	0	0	**463**	45	49
15:00	24	1	6	7	31	99	**189**	**72**	20	0	0	**1**	0	0	450	46	49
16:00	30	0	0	2	8	48	55	19	1	0	0	0	0	0	163	44	48
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	250	22	78	139	389	1182	1373	568	118	16	2	1	0	0	4138		
Percent	6.0%	0.5%	1.9%	3.4%	9.4%	28.6%	33.2%	13.7%	2.9%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	09:00	10:00	09:00	07:00	07:00	07:00	07:00	08:00	04:00				07:00		
Vol.	29	3	14	20	58	144	165	60	12	3	1				475		
PM Peak	13:00	12:00	12:00	12:00	14:00	14:00	15:00	15:00	13:00	14:00		15:00			14:00		
Vol.	32	7	16	26	56	130	189	72	21	3		1			463		

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
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Site Code:
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Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	12	14
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
Percent	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	18:00														18:00		
Vol.	1														1		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/07/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/08/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: West of Mississippi
Weather: Clear
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/09/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.																	
Total	1784	180	491	1009	3536	10877	12141	4792	825	125	20	3	0	0	35783		
Percent	5.0%	0.5%	1.4%	2.8%	9.9%	30.4%	33.9%	13.4%	2.3%	0.3%	0.1%	0.0%	0.0%	0.0%			

	15th Percentile :	32 MPH
	50th Percentile :	40 MPH
	85th Percentile :	45 MPH
	95th Percentile :	49 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	23018
	Percent in Pace :	64.3%
	Number of Vehicles > 55 MPH :	148
	Percent of Vehicles > 55 MPH :	0.4%
	Mean Speed(Average) :	39 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/19/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	**3**	**102**	**17**	**1**	**10**	0	0	0	0	0	0	0	0	**133**
22:00	0	63	14	0	5	0	0	**2**	0	0	0	0	0	84
23:00	0	43	4	0	0	0	0	0	**1**	0	0	0	0	48
Day Total	3	208	35	1	15	0	0	2	1	0	0	0	0	265
Percent	1.1%	78.5%	13.2%	0.4%	5.7%	0.0%	0.0%	0.8%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	21:00 3	21:00 102	21:00 17	21:00 1	21:00 10			22:00 2	23:00 1					21:00 133

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/20/18	0	24	1	0	1	0	0	0	0	0	0	0	0	26
01:00	0	17	4	0	0	0	0	0	0	0	0	0	0	21
02:00	0	8	1	0	2	0	0	0	0	0	0	0	0	11
03:00	0	3	0	0	2	0	0	0	0	0	0	0	0	5
04:00	0	5	2	0	2	**1**	0	0	0	0	0	0	0	10
05:00	0	6	3	0	1	0	0	0	**1**	0	0	0	0	11
06:00	0	24	13	0	3	0	0	0	0	0	0	0	0	40
07:00	0	42	15	0	8	1	0	0	0	0	0	0	0	66
08:00	0	67	15	0	11	1	0	0	0	0	0	0	0	94
09:00	**2**	119	29	**1**	10	1	0	0	0	0	0	0	0	162
10:00	1	177	39	0	**26**	1	0	0	0	0	0	0	0	244
11:00	1	**192**	**51**	1	16	0	0	0	1	0	0	0	0	**262**
12 PM	0	**247**	**75**	0	**31**	0	0	**1**	**1**	0	0	0	0	**355**
13:00	0	215	53	0	29	0	0	1	0	0	0	0	0	298
14:00	1	219	55	0	25	**1**	0	0	0	0	0	0	0	301
15:00	**4**	188	50	0	19	0	0	0	0	0	0	0	0	261
16:00	4	172	49	0	23	0	0	0	0	0	0	0	0	248
17:00	0	171	44	0	20	0	0	0	0	0	0	0	0	235
18:00	1	172	38	0	12	0	0	0	0	0	0	0	0	223
19:00	0	128	23	0	12	0	0	0	0	0	0	0	0	163
20:00	1	78	14	0	9	0	0	0	0	0	0	0	0	102
21:00	0	86	19	0	7	0	0	0	0	0	0	0	0	112
22:00	1	46	17	0	9	0	0	0	0	0	0	0	0	73
23:00	3	32	7	0	2	0	0	0	0	0	0	0	0	44
Day Total	19	2438	617	2	280	6	0	2	3	0	0	0	0	3367
Percent	0.6%	72.4%	18.3%	0.1%	8.3%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	09:00	10:00	04:00			05:00					11:00
Vol.	2	192	51	1	26	1			1					262
PM Peak	15:00	12:00	12:00		12:00	14:00		12:00	12:00					12:00
Vol.	4	247	75		31	1		1	1					355

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/21/18	0	23	5	0	5	0	0	0	0	0	0	0	0	33
01:00	0	14	0	0	1	0	0	0	0	0	0	0	0	15
02:00	0	10	1	0	3	0	0	0	0	0	0	0	0	14
03:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
06:00	0	10	6	0	0	0	0	0	0	0	0	0	0	16
07:00	0	31	9	0	3	0	0	0	0	0	0	0	0	43
08:00	0	48	8	0	3	0	0	0	0	0	0	0	0	59
09:00	0	81	26	0	8	0	0	**1**	0	0	0	0	0	116
10:00	0	123	22	0	**22**	0	0	0	0	0	0	0	0	167
11:00	0	**136**	**39**	0	16	**1**	0	0	0	0	0	0	0	**192**
12 PM	0	190	44	0	17	0	0	0	0	0	0	0	0	251
13:00	1	**206**	32	0	20	0	0	**1**	**1**	0	0	0	0	261
14:00	**19**	205	38	**2**	11	0	0	0	1	0	0	0	0	**276**
15:00	0	175	45	0	**21**	1	0	1	0	0	0	0	0	243
16:00	2	205	**51**	0	10	**2**	0	1	1	0	0	0	0	272
17:00	0	202	34	0	11	1	0	0	0	0	0	0	0	248
18:00	1	155	28	0	13	0	0	0	0	0	0	0	0	197
19:00	0	108	23	0	7	0	0	0	0	0	0	0	0	138
20:00	0	86	14	0	10	0	0	1	0	0	0	0	0	111
21:00	0	50	13	0	11	0	0	0	0	0	0	0	0	74
22:00	0	39	5	0	3	0	0	0	0	0	0	0	0	47
23:00	0	9	3	0	2	0	0	0	0	0	0	0	0	14
Day Total	23	2126	449	2	198	5	0	5	3	0	0	0	0	2811
Percent	0.8%	75.6%	16.0%	0.1%	7.0%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00		10:00	11:00		09:00						11:00
Vol.		136	39		22	1		1						192
PM Peak	14:00	13:00	16:00	14:00	15:00	16:00		13:00	13:00					14:00
Vol.	19	206	51	2	21	2		1	1					276

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/22/18	0	6	2	0	0	0	0	0	0	0	0	0	0	8
01:00	0	11	2	1	0	0	0	0	0	0	0	0	0	14
02:00	0	7	1	0	0	1	0	0	0	0	0	0	0	9
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	8	0	0	2	1	0	0	0	0	0	0	0	11
05:00	0	16	7	2	8	1	0	0	1	0	0	0	0	35
06:00	0	58	17	4	12	2	0	0	1	0	0	0	0	94
07:00	0	196	65	**17**	30	3	0	2	0	0	0	0	0	313
08:00	1	**259**	**96**	8	**47**	4	1	**6**	0	0	0	0	0	**422**
09:00	**5**	199	59	2	41	**5**	**2**	3	**4**	0	0	0	0	320
10:00	0	158	54	1	29	0	0	2	2	0	0	0	0	246
11:00	0	215	80	8	43	1	1	1	1	0	0	0	0	350
12 PM	0	220	67	1	40	**5**	0	**3**	2	0	0	0	0	338
13:00	2	197	53	1	33	2	0	0	**6**	0	0	0	0	294
14:00	4	307	86	**15**	35	3	0	2	2	0	0	0	0	454
15:00	2	294	91	4	**45**	2	0	3	0	0	0	0	0	441
16:00	**8**	384	91	1	35	3	0	1	0	0	0	0	0	523
17:00	7	**410**	**96**	0	26	3	**1**	0	0	0	0	0	0	**543**
18:00	1	278	70	1	32	1	0	0	1	0	0	0	0	384
19:00	0	211	48	0	19	1	0	0	0	0	0	0	0	279
20:00	0	132	26	0	15	0	0	1	1	0	0	0	0	175
21:00	0	60	11	0	3	0	0	1	0	0	0	0	0	75
22:00	0	41	4	0	1	0	0	0	0	0	0	0	0	46
23:00	0	31	6	0	0	0	0	0	0	0	0	0	0	37
Day Total	30	3702	1032	66	496	38	5	25	21	0	0	0	0	5415
Percent	0.6%	68.4%	19.1%	1.2%	9.2%	0.7%	0.1%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	07:00	08:00	09:00	09:00	08:00	09:00					08:00
Vol.	5	259	96	17	47	5	2	6	4					422
PM Peak	16:00	17:00	17:00	14:00	15:00	12:00	17:00	12:00	13:00					17:00
Vol.	8	410	96	15	45	5	1	3	6					543

Tri-State Traffic Data, Inc.

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Weather: Varied
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/23/18	0	12	3	0	3	0	0	0	1	0	0	0	0	19
01:00	0	7	1	0	1	0	0	0	1	0	0	0	0	10
02:00	**1**	4	0	0	1	0	0	0	0	0	0	0	0	6
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	6	4	0	4	1	0	0	0	0	0	0	0	15
05:00	0	13	12	2	3	0	0	0	1	0	0	0	0	31
06:00	0	53	16	4	12	2	0	0	0	0	0	0	0	87
07:00	1	190	**70**	**13**	**39**	1	0	2	0	0	0	0	0	316
08:00	1	153	57	5	33	**5**	0	**7**	0	0	0	0	0	261
09:00	0	150	60	0	23	2	**2**	1	1	0	0	0	0	239
10:00	0	126	55	5	27	1	0	5	**2**	0	0	0	0	221
11:00	0	**218**	64	8	35	0	0	4	0	0	0	0	0	**329**
12 PM	2	208	66	1	**43**	2	0	**4**	**2**	0	0	0	0	328
13:00	0	208	68	3	30	**5**	0	3	1	0	0	0	0	318
14:00	1	316	90	**8**	33	3	1	1	2	0	0	0	0	455
15:00	3	317	**102**	4	42	0	0	1	0	0	0	0	0	469
16:00	**7**	340	99	2	36	1	0	0	1	0	0	0	0	486
17:00	3	**391**	102	2	33	3	**2**	4	0	0	0	0	0	**540**
18:00	1	247	69	0	36	0	0	2	0	0	0	0	0	355
19:00	1	196	53	0	25	1	0	1	0	0	0	0	0	277
20:00	0	143	32	0	21	0	0	0	0	0	0	0	0	196
21:00	0	90	18	0	10	0	0	0	1	0	0	0	0	119
22:00	0	23	7	0	6	0	0	0	0	0	0	0	0	36
23:00	0	34	5	0	1	0	0	0	0	0	0	0	0	40
Day Total	21	3448	1054	57	497	27	5	35	13	0	0	0	0	5157
Percent	0.4%	66.9%	20.4%	1.1%	9.6%	0.5%	0.1%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	02:00	11:00	07:00	07:00	07:00	08:00	09:00	08:00	10:00					11:00
Vol.	1	218	70	13	39	5	2	7	2					329
PM Peak	16:00	17:00	15:00	14:00	12:00	13:00	17:00	12:00	12:00					17:00
Vol.	7	391	102	8	43	5	2	4	2					540

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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/24/18	0	15	1	0	1	0	0	0	0	0	0	0	0	17
01:00	0	5	2	0	2	0	0	0	0	0	0	0	0	9
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	2	1	0	1	0	0	0	1	0	0	0	0	5
04:00	0	10	3	0	6	1	0	0	0	0	0	0	0	20
05:00	0	22	9	1	5	1	0	0	**2**	0	0	0	0	40
06:00	0	51	23	4	10	2	0	0	0	0	0	0	0	90
07:00	1	189	71	**15**	27	1	0	0	0	0	0	0	0	304
08:00	1	162	55	5	27	2	0	**5**	1	0	0	0	0	258
09:00	**2**	157	47	3	28	2	**1**	0	2	0	0	0	0	242
10:00	0	185	59	3	29	3	0	1	2	0	0	0	0	282
11:00	1	**245**	**80**	11	**44**	**4**	0	3	2	0	0	0	0	**390**
12 PM	2	238	82	1	50	**6**	0	**8**	**2**	0	0	0	0	389
13:00	1	242	60	2	36	6	1	3	2	0	0	0	0	353
14:00	2	293	81	**15**	43	2	0	2	1	0	0	0	0	439
15:00	1	284	97	4	**52**	1	0	0	0	0	0	0	0	439
16:00	1	361	102	0	41	4	**2**	0	0	0	0	0	0	511
17:00	**5**	**399**	**114**	0	31	3	2	5	0	0	0	0	0	**559**
18:00	0	256	71	0	32	2	0	1	0	0	0	0	0	362
19:00	0	202	71	1	17	1	0	0	0	0	0	0	0	292
20:00	0	141	25	0	12	0	0	0	0	0	0	0	0	178
21:00	0	101	15	0	3	0	0	0	0	0	0	0	0	119
22:00	0	37	11	0	2	0	0	0	0	0	0	0	0	50
23:00	0	39	7	0	1	0	0	0	0	0	0	0	0	47
Day Total	17	3639	1087	65	500	41	6	28	15	0	0	0	0	5398
Percent	0.3%	67.4%	20.1%	1.2%	9.3%	0.8%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	07:00	11:00	11:00	09:00	08:00	05:00					11:00
Vol.	2	245	80	15	44	4	1	5	2					390
PM Peak	17:00	17:00	17:00	14:00	15:00	12:00	16:00	12:00	12:00					17:00
Vol.	5	399	114	15	52	6	2	8	2					559

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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/25/18	0	22	1	1	3	0	0	0	0	0	0	0	0	27
01:00	1	9	1	0	0	0	0	0	0	0	0	0	0	11
02:00	0	7	0	0	3	0	0	0	0	0	0	0	0	10
03:00	0	5	2	0	2	0	0	0	0	0	0	0	0	9
04:00	1	8	3	0	4	0	0	1	0	0	0	0	0	17
05:00	0	18	7	2	9	0	0	0	0	0	0	0	0	36
06:00	1	50	23	3	15	0	0	0	0	0	0	0	0	92
07:00	**4**	187	72	**14**	36	1	0	0	0	0	0	0	0	314
08:00	1	153	66	4	40	**3**	0	1	0	0	0	0	0	268
09:00	1	131	65	1	37	1	**1**	2	**2**	0	0	0	0	241
10:00	1	163	58	5	49	1	0	2	1	0	0	0	0	280
11:00	1	**244**	**96**	2	**50**	1	0	**4**	2	0	0	0	0	**400**
12 PM	4	**357**	110	**7**	**50**	**3**	0	1	**1**	0	0	0	0	**533**
13:00	5	311	77	7	33	2	**1**	3	1	0	0	0	0	440
14:00	0	254	82	1	45	1	0	**4**	0	0	0	0	0	387
15:00	**7**	356	96	1	45	3	0	0	1	0	0	0	0	509
16:00	3	357	**116**	0	43	2	0	1	0	0	0	0	0	522
17:00	1	340	83	0	38	2	0	1	0	0	0	0	0	465
18:00	1	206	37	1	20	1	0	3	0	0	0	0	0	269
19:00	0	116	31	1	15	0	0	0	0	0	0	0	0	163
20:00	0	91	20	0	4	0	0	0	0	0	0	0	0	115
21:00	0	83	20	0	3	0	0	0	0	0	0	0	0	106
22:00	0	67	16	0	8	0	0	0	0	0	0	0	0	91
23:00	0	50	10	0	6	0	0	0	0	0	0	0	0	66
Day Total	32	3585	1092	50	558	21	2	23	8	0	0	0	0	5371
Percent	0.6%	66.7%	20.3%	0.9%	10.4%	0.4%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	07:00	11:00	08:00	09:00	11:00	09:00					11:00
Vol.	4	244	96	14	50	3	1	4	2					400
PM Peak	15:00	12:00	16:00	12:00	12:00	12:00	13:00	14:00	12:00					12:00
Vol.	7	357	116	7	50	3	1	4	1					533

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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/26/18	0	13	7	0	0	0	0	0	0	0	0	0	0	20
01:00	0	8	3	0	3	0	0	0	0	0	0	0	0	14
02:00	0	8	0	1	1	0	0	0	0	0	0	0	0	10
03:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
04:00	0	6	3	0	3	1	0	0	0	0	0	0	0	13
05:00	0	17	7	0	10	1	0	0	0	0	0	0	0	35
06:00	0	44	9	1	10	0	0	1	0	0	0	0	0	65
07:00	**1**	125	43	0	26	1	0	2	0	0	0	0	0	198
08:00	1	126	52	0	35	1	0	1	0	0	0	0	0	216
09:00	0	136	70	**2**	37	0	**1**	**3**	**2**	0	0	0	0	251
10:00	1	152	67	2	**45**	1	0	1	1	0	0	0	0	270
11:00	0	**262**	**86**	1	43	**3**	0	1	0	0	0	0	0	**396**
12 PM	0	247	85	1	**56**	3	0	**5**	**3**	0	0	0	0	400
13:00	1	230	90	**3**	47	3	0	4	1	0	0	0	0	379
14:00	1	270	75	0	36	**4**	0	2	3	0	0	0	0	391
15:00	3	**376**	82	0	50	1	0	1	0	0	0	0	0	**513**
16:00	**4**	364	**95**	1	36	1	**2**	2	0	0	0	0	0	505
17:00	1	322	86	0	34	3	0	1	0	0	0	0	0	447
18:00	1	226	48	1	21	1	0	0	0	0	0	0	0	298
19:00	0	159	40	0	18	0	0	1	0	0	0	0	0	218
20:00	1	117	19	0	9	0	0	0	0	0	0	0	0	146
21:00	0	78	18	0	8	0	0	0	0	0	0	0	0	104
22:00	1	82	9	0	4	0	0	0	0	0	0	0	0	96
23:00	0	26	8	0	4	0	0	1	0	0	0	0	0	39
Day Total	16	3396	1002	13	537	24	3	26	10	0	0	0	0	5027
Percent	0.3%	67.6%	19.9%	0.3%	10.7%	0.5%	0.1%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	09:00	10:00	11:00	09:00	09:00	09:00					11:00
Vol.	1	262	86	2	45	3	1	3	2					396
PM Peak	16:00	15:00	16:00	13:00	12:00	14:00	16:00	12:00	12:00					15:00
Vol.	4	376	95	3	56	4	2	5	3					513

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EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/27/18	0	18	0	0	1	0	0	0	**1**	0	0	0	0	20
01:00	0	12	5	0	1	0	0	0	0	0	0	0	0	18
02:00	0	8	1	0	2	0	0	0	0	0	0	0	0	11
03:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	7	3	0	1	0	0	0	0	0	0	0	0	11
05:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
06:00	0	20	7	0	3	0	0	0	0	0	0	0	0	30
07:00	0	37	11	0	5	0	0	0	0	0	0	0	0	53
08:00	0	62	23	0	11	**1**	0	0	0	0	0	0	0	97
09:00	0	127	41	0	18	0	0	**1**	0	0	0	0	0	187
10:00	0	205	51	0	20	1	0	0	0	0	0	0	0	277
11:00	0	**213**	**60**	**2**	**33**	0	0	1	0	0	0	0	0	**309**
12 PM	**1**	**258**	69	0	35	**3**	0	0	0	0	0	0	0	**366**
13:00	0	199	**75**	0	**36**	1	0	**1**	0	0	0	0	0	312
14:00	0	229	51	0	33	0	0	0	0	0	0	0	0	313
15:00	0	213	45	0	16	0	0	0	0	0	0	0	0	274
16:00	0	229	52	0	28	0	0	0	0	0	0	0	0	309
17:00	0	192	50	0	21	0	0	1	0	0	0	0	0	264
18:00	1	167	42	0	16	0	0	0	0	0	0	0	0	226
19:00	0	116	33	0	11	0	0	0	0	0	0	0	0	160
20:00	0	119	14	0	13	0	0	0	0	0	0	0	0	146
21:00	0	83	15	0	8	0	0	0	0	0	0	0	0	106
22:00	0	64	6	0	5	0	0	0	0	0	0	0	0	75
23:00	0	43	6	0	3	0	0	0	0	0	0	0	0	52
Day Total	2	2633	662	2	321	6	0	4	1	0	0	0	0	3631
Percent	0.1%	72.5%	18.2%	0.1%	8.8%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00	11:00	11:00	08:00		09:00	00:00					11:00
Vol.		213	60	2	33	1		1	1					309
PM Peak	12:00	12:00	13:00		13:00	12:00		13:00						12:00
Vol.	1	258	75		36	3		1						366

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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/28/18	0	28	6	0	1	0	0	0	0	0	0	0	0	35
01:00	0	11	4	0	1	0	0	0	0	0	0	0	0	16
02:00	0	7	1	0	2	0	0	0	0	0	0	0	0	10
03:00	0	6	5	0	1	0	0	0	0	0	0	0	0	12
04:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
05:00	0	5	5	0	2	0	0	0	0	0	0	0	0	12
06:00	0	9	4	0	2	0	0	0	0	0	0	0	0	15
07:00	0	28	6	0	4	0	0	0	0	0	0	0	0	38
08:00	0	46	13	0	6	0	0	0	0	0	0	0	0	65
09:00	0	82	15	0	13	**1**	0	0	0	0	0	0	0	111
10:00	0	100	**37**	0	**18**	0	0	0	0	0	0	0	0	155
11:00	**1**	**128**	24	0	12	1	0	**2**	0	0	0	0	0	**168**
12 PM	**1**	187	**46**	0	20	0	0	0	0	0	0	0	0	254
13:00	0	**209**	41	0	**31**	0	0	2	0	0	0	0	0	**283**
14:00	0	173	39	0	22	**1**	0	0	0	0	0	0	0	235
15:00	1	174	42	0	27	1	0	0	0	0	0	0	0	245
16:00	0	164	41	0	29	0	0	0	0	0	0	0	0	234
17:00	0	169	46	0	13	1	0	**3**	0	0	0	0	0	232
18:00	0	114	19	0	18	0	0	0	**1**	0	0	0	0	152
19:00	0	102	35	0	7	0	0	0	0	0	0	0	0	144
20:00	0	68	11	0	9	0	0	0	0	0	0	0	0	88
21:00	1	62	18	0	7	0	0	0	0	0	0	0	0	88
22:00	0	42	4	0	2	0	0	0	1	0	0	0	0	49
23:00	0	21	3	0	5	0	0	0	0	0	0	0	0	29
Day Total	4	1940	465	0	253	5	0	7	2	0	0	0	0	2676
Percent	0.1%	72.5%	17.4%	0.0%	9.5%	0.2%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		10:00	09:00		11:00						11:00
Vol.	1	128	37		18	1		2						168
PM Peak	12:00	13:00	12:00		13:00	14:00		17:00	18:00					13:00
Vol.	1	209	46		31	1		3	1					283

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/29/18	0	15	3	0	1	0	0	0	0	0	0	0	0	19
01:00	0	8	3	0	2	0	0	0	0	0	0	0	0	13
02:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
03:00	0	4	0	0	0	1	0	0	0	0	0	0	0	5
04:00	0	6	2	0	2	0	0	0	0	0	0	0	0	10
05:00	0	19	10	2	4	0	0	0	0	0	0	0	0	35
06:00	0	57	23	3	9	1	0	0	0	0	0	0	0	93
07:00	0	189	81	**14**	40	1	0	1	0	0	0	0	0	326
08:00	**2**	177	70	5	33	**2**	0	2	1	0	0	0	0	292
09:00	1	133	58	5	35	0	0	2	1	0	0	0	0	235
10:00	1	159	46	5	39	1	0	**4**	1	0	0	0	0	256
11:00	1	**224**	**90**	8	**54**	0	0	2	**5**	0	0	0	0	**384**
12 PM	0	227	83	4	42	2	0	**3**	**4**	0	0	0	0	365
13:00	1	242	68	6	38	**4**	0	2	3	0	0	0	0	364
14:00	2	297	88	**12**	**62**	4	0	2	0	0	0	0	0	467
15:00	6	328	**107**	2	44	3	0	0	0	0	0	0	0	490
16:00	4	330	106	3	43	1	0	0	1	0	0	0	0	488
17:00	**8**	**371**	103	0	50	2	**1**	0	0	0	0	0	0	**535**
18:00	0	286	80	0	36	1	0	0	0	0	0	0	0	403
19:00	0	158	60	0	13	1	0	1	0	0	0	0	0	233
20:00	0	123	30	0	16	0	0	0	0	0	0	0	0	169
21:00	0	78	11	1	5	1	0	0	0	0	0	0	0	96
22:00	0	30	6	0	2	0	0	0	0	0	0	0	0	38
23:00	0	36	5	0	2	0	0	0	0	0	0	0	0	43
Day Total	26	3501	1135	70	572	25	1	19	16	0	0	0	0	5365
Percent	0.5%	65.3%	21.2%	1.3%	10.7%	0.5%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	07:00	11:00	08:00		10:00	11:00					11:00
Vol.	2	224	90	14	54	2		4	5					384
PM Peak	17:00	17:00	15:00	14:00	14:00	13:00	17:00	12:00	12:00					17:00
Vol.	8	371	107	12	62	4	1	3	4					535

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/30/18	0	15	2	0	2	0	0	0	1	0	0	0	0	20
01:00	0	8	2	1	0	0	0	0	0	0	0	0	0	11
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
03:00	0	5	0	0	2	0	0	0	0	0	0	0	0	7
04:00	0	7	2	0	2	0	0	0	0	0	0	0	0	11
05:00	0	17	6	1	5	2	0	0	0	0	0	0	0	31
06:00	0	61	22	6	13	1	0	1	0	0	0	0	0	104
07:00	0	189	80	**16**	44	**3**	0	0	0	0	0	0	0	332
08:00	0	164	74	5	42	1	**1**	2	1	0	0	0	0	290
09:00	1	139	58	4	32	0	0	2	0	0	0	0	0	236
10:00	0	171	45	4	34	1	0	**3**	**3**	0	0	0	0	261
11:00	**4**	**220**	**88**	8	**51**	2	0	1	0	0	0	0	0	**374**
12 PM	2	245	88	3	**58**	3	0	**6**	2	0	0	0	0	407
13:00	1	220	73	1	31	2	0	2	**5**	0	0	0	0	335
14:00	2	270	89	**18**	55	2	1	0	3	0	0	0	0	440
15:00	4	325	98	3	41	**5**	0	5	1	0	0	0	0	482
16:00	**5**	388	**105**	1	47	2	**2**	1	1	0	0	0	0	**552**
17:00	4	**404**	102	2	36	2	0	2	0	0	0	0	0	552
18:00	4	258	60	0	48	0	0	1	0	0	0	0	0	371
19:00	1	184	64	0	26	1	0	0	0	0	0	0	0	276
20:00	1	124	28	0	15	0	0	0	0	0	0	0	0	168
21:00	0	78	16	0	7	0	0	0	0	0	0	0	0	101
22:00	0	40	6	0	0	0	0	0	0	0	0	0	0	46
23:00	0	34	4	0	1	0	0	0	0	0	0	0	0	39
Day Total	29	3570	1113	73	592	27	4	26	17	0	0	0	0	5451
Percent	0.5%	65.5%	20.4%	1.3%	10.9%	0.5%	0.1%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	07:00	11:00	07:00	08:00	10:00	10:00					11:00
Vol.	4	220	88	16	51	3	1	3	3					374
PM Peak	16:00	17:00	16:00	14:00	12:00	15:00	16:00	12:00	13:00					16:00
Vol.	5	404	105	18	58	5	2	6	5					552

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Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/31/18	0	21	5	0	2	0	0	0	0	0	0	0	0	28
01:00	0	10	3	0	1	0	0	0	0	0	0	0	0	14
02:00	0	4	1	0	2	0	0	0	0	0	0	0	0	7
03:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	5	4	0	3	0	0	0	0	0	0	0	0	12
05:00	0	18	5	2	6	2	0	0	0	0	0	0	0	33
06:00	0	55	24	4	11	1	0	1	0	0	0	0	0	96
07:00	1	176	81	**13**	35	1	**1**	0	0	0	0	0	0	308
08:00	1	159	74	5	44	**3**	0	**3**	**2**	0	0	0	0	291
09:00	1	193	69	3	29	1	0	3	0	0	0	0	0	299
10:00	0	185	69	2	30	0	0	2	0	0	0	0	0	288
11:00	**2**	**217**	**87**	11	**48**	2	0	3	2	0	0	0	0	**372**
12 PM	3	236	97	2	44	1	0	**4**	0	0	0	0	0	387
13:00	4	232	**122**	1	51	2	0	1	**1**	0	0	0	0	414
14:00	6	287	99	**19**	**57**	**4**	0	3	0	0	0	0	0	475
15:00	6	325	109	5	39	3	**3**	1	0	0	0	0	0	491
16:00	**9**	**396**	119	3	46	3	2	1	0	0	0	0	0	**579**
17:00	3	348	92	1	30	2	2	0	0	0	0	0	0	478
18:00	0	180	42	0	24	0	0	0	1	0	0	0	0	247
19:00	1	151	42	0	18	0	0	0	0	0	0	0	0	212
20:00	0	146	44	1	22	1	0	0	0	0	0	0	0	214
21:00	0	71	14	0	10	0	0	0	0	0	0	0	0	95
22:00	0	28	12	0	5	0	0	1	0	0	0	0	0	46
23:00	0	26	8	0	1	0	0	0	0	0	0	0	0	35
Day Total	37	3475	1222	72	558	26	8	23	6	0	0	0	0	5427
Percent	0.7%	64.0%	22.5%	1.3%	10.3%	0.5%	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	07:00	11:00	08:00	07:00	08:00	08:00					11:00
Vol.	2	217	87	13	48	3	1	3	2					372
PM Peak	16:00	16:00	13:00	14:00	14:00	14:00	15:00	12:00	13:00					16:00
Vol.	9	396	122	19	57	4	3	4	1					579

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/01/18	0	22	5	1	2	0	0	0	0	0	0	0	0	30
01:00	0	8	5	0	0	0	0	0	0	0	0	0	0	13
02:00	1	9	1	0	0	0	0	0	0	0	0	0	0	11
03:00	0	3	4	0	3	0	0	0	0	0	0	0	0	10
04:00	0	5	4	0	5	1	0	0	0	0	0	0	0	15
05:00	0	24	5	2	7	0	0	0	0	0	0	0	0	38
06:00	1	41	24	4	14	1	0	0	0	0	0	0	0	85
07:00	**2**	179	89	**15**	43	2	0	2	**2**	0	0	0	0	334
08:00	2	111	92	6	45	**3**	0	4	0	0	0	0	0	263
09:00	0	155	65	2	32	3	0	**7**	1	0	0	0	0	265
10:00	1	135	76	5	50	3	0	0	0	**1**	0	0	0	271
11:00	2	**195**	**124**	10	**61**	2	0	1	2	0	0	0	0	**397**
12 PM	4	207	122	5	44	**5**	0	**7**	2	0	0	0	0	396
13:00	1	193	82	5	48	1	0	4	2	0	0	0	0	336
14:00	**10**	290	131	**10**	54	1	**1**	2	0	0	0	0	0	499
15:00	7	266	147	7	51	2	1	2	**3**	0	0	0	0	486
16:00	9	296	**165**	2	**58**	3	0	2	0	0	0	0	0	**535**
17:00	4	**300**	135	1	47	1	1	0	1	0	0	0	0	490
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	44	2439	1276	75	564	28	3	31	13	1	0	0	0	4474
Percent	1.0%	54.5%	28.5%	1.7%	12.6%	0.6%	0.1%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	07:00	11:00	08:00		09:00	07:00	10:00				11:00
Vol.	2	195	124	15	61	3		7	2	1				397
PM Peak	14:00	17:00	16:00	14:00	16:00	12:00	14:00	12:00	15:00					16:00
Vol.	10	300	165	10	58	5	1	7	3					535
Grand Total	303	40100	12241	548	5941	279	37	256	129	1	0	0	0	59835
Percent	0.5%	67.0%	20.5%	0.9%	9.9%	0.5%	0.1%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	

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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/19/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	0	**72**	**16**	0	**2**	0	0	0	0	0	0	0	0	**90**
22:00	0	50	8	0	2	0	0	0	0	0	0	0	0	60
23:00	0	33	3	0	0	0	0	0	0	0	0	0	0	36
Day Total	0	155	27	0	4	0	0	0	0	0	0	0	0	186
Percent	0.0%	83.3%	14.5%	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.		21:00 72	21:00 16		21:00 2									21:00 90

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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/20/18	0	21	3	0	1	0	0	0	0	0	0	0	0	25
01:00	0	15	2	0	1	0	0	0	0	0	0	0	0	18
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
04:00	0	15	2	0	2	0	0	0	0	0	0	0	0	19
05:00	0	28	16	0	6	0	0	0	**2**	0	0	0	0	52
06:00	**1**	38	19	**1**	6	1	1	0	0	0	0	0	0	67
07:00	0	87	14	0	6	0	1	0	1	0	0	0	0	109
08:00	0	148	34	0	9	0	1	0	2	0	0	0	0	194
09:00	1	199	35	0	**12**	0	0	**1**	0	0	0	0	0	248
10:00	1	225	56	0	11	**2**	**2**	0	0	0	0	0	0	297
11:00	0	**227**	**65**	0	7	0	0	0	1	0	0	0	0	**300**
12 PM	0	194	45	0	9	0	**1**	**1**	0	0	0	0	0	250
13:00	0	**208**	45	0	**14**	0	0	0	0	0	0	0	0	**267**
14:00	1	180	**51**	0	3	0	0	0	0	0	0	0	0	235
15:00	**2**	176	40	0	4	0	0	0	0	0	0	0	0	222
16:00	2	194	40	0	7	0	0	0	0	0	0	0	0	243
17:00	1	148	37	0	6	0	0	0	0	0	0	0	0	192
18:00	0	141	38	0	2	**1**	0	0	0	0	0	0	0	182
19:00	1	114	24	0	1	0	0	0	0	0	0	0	0	140
20:00	0	90	15	0	2	0	0	0	0	0	0	0	0	107
21:00	0	52	11	0	0	0	0	0	0	0	0	0	0	63
22:00	1	48	7	0	2	0	0	0	0	0	0	0	0	58
23:00	0	21	11	0	2	0	0	0	0	0	0	0	0	34
Day Total	11	2580	612	1	113	4	6	2	6	0	0	0	0	3335
Percent	0.3%	77.4%	18.4%	0.0%	3.4%	0.1%	0.2%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	06:00	09:00	10:00	10:00	09:00	05:00					11:00
Vol.	1	227	65	1	12	2	2	1	2					300
PM Peak	15:00	13:00	14:00		13:00	18:00	12:00	12:00						13:00
Vol.	2	208	51		14	1	1	1						267

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www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/21/18	0	14	1	0	1	0	0	0	0	0	0	0	0	16
01:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	15	2	0	0	0	0	0	0	0	0	0	0	17
04:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
05:00	0	15	5	0	0	0	0	**1**	0	0	0	0	0	21
06:00	0	23	9	0	3	0	0	0	0	0	0	0	0	35
07:00	0	45	3	0	1	0	0	0	0	0	0	0	0	49
08:00	0	70	15	0	5	0	0	0	0	0	0	0	0	90
09:00	0	140	24	0	8	0	0	0	0	0	0	0	0	172
10:00	0	134	**37**	0	2	0	0	0	0	0	0	0	0	173
11:00	**2**	**165**	32	0	**9**	0	0	1	0	0	0	0	0	**209**
12 PM	**26**	**230**	**46**	0	**8**	0	0	**1**	**1**	0	0	0	0	**312**
13:00	1	177	42	0	8	**1**	0	0	0	0	0	0	0	229
14:00	1	175	38	0	3	0	0	1	0	0	0	0	0	218
15:00	1	173	41	0	4	0	0	0	0	0	0	0	0	219
16:00	2	176	32	0	2	0	0	0	1	0	0	0	0	213
17:00	0	162	24	0	5	0	0	0	0	0	0	0	0	191
18:00	0	143	20	0	3	0	0	0	0	0	0	0	0	166
19:00	0	134	16	0	7	0	0	0	0	0	0	0	0	157
20:00	0	58	10	0	0	1	0	0	0	0	0	0	0	69
21:00	0	32	6	0	3	0	0	1	0	0	0	0	0	42
22:00	0	27	5	0	0	0	0	0	0	0	0	0	0	32
23:00	0	10	4	0	0	0	0	0	0	0	0	0	0	14
Day Total	33	2140	415	0	73	2	0	5	2	0	0	0	0	2670
Percent	1.2%	80.1%	15.5%	0.0%	2.7%	0.1%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		11:00			05:00						11:00
Vol.	2	165	37		9			1						209
PM Peak	12:00	12:00	12:00		12:00	13:00		12:00	12:00					12:00
Vol.	26	230	46		8	1		1	1					312

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/22/18	0	7	0	0	1	0	0	0	0	0	0	0	0	8
01:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	21	11	0	7	0	0	0	0	0	0	0	0	39
05:00	**1**	51	32	2	10	0	0	1	0	0	0	0	0	97
06:00	1	177	77	1	17	1	5	2	0	0	0	0	0	281
07:00	0	**426**	**106**	12	27	1	4	1	1	**1**	0	0	0	**579**
08:00	1	354	75	**14**	**31**	1	**7**	2	5	0	0	0	0	490
09:00	1	207	77	1	22	**2**	4	**5**	5	1	0	0	0	325
10:00	0	178	47	2	19	2	3	2	8	0	0	0	0	261
11:00	1	225	76	3	23	2	4	5	**11**	0	0	0	0	350
12 PM	3	245	67	5	25	1	**5**	5	6	0	0	0	0	362
13:00	0	216	71	4	**26**	**4**	5	3	**13**	**1**	0	0	0	343
14:00	4	240	76	2	25	0	1	**6**	3	0	0	0	0	357
15:00	2	279	**89**	**6**	22	1	1	1	0	0	0	0	0	401
16:00	5	284	83	1	16	0	0	0	2	0	0	0	0	391
17:00	**6**	**314**	79	0	21	0	0	0	0	0	0	0	0	**420**
18:00	1	211	47	0	6	0	0	0	0	0	0	0	0	265
19:00	0	139	22	0	7	0	0	0	0	1	0	0	0	169
20:00	0	88	25	0	3	0	0	0	0	0	0	0	0	116
21:00	0	43	11	0	0	0	0	0	0	0	0	0	0	54
22:00	0	26	5	0	0	0	0	0	0	0	0	0	0	31
23:00	0	17	5	0	2	0	0	0	0	0	0	0	0	24
Day Total	26	3770	1082	53	310	15	39	33	54	4	0	0	0	5386
Percent	0.5%	70.0%	20.1%	1.0%	5.8%	0.3%	0.7%	0.6%	1.0%	0.1%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	07:00	08:00	08:00	09:00	08:00	09:00	11:00	07:00				07:00
Vol.	1	426	106	14	31	2	7	5	11	1				579
PM Peak	17:00	17:00	15:00	15:00	13:00	13:00	12:00	14:00	13:00	13:00				17:00
Vol.	6	314	89	6	26	4	5	6	13	1				420

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WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/23/18	1	10	1	0	1	0	0	0	0	0	0	0	0	13
01:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	8	3	1	0	0	0	0	0	0	0	0	0	12
04:00	0	11	9	0	5	1	0	0	0	0	0	0	0	26
05:00	1	57	34	0	14	1	2	0	0	0	0	0	0	109
06:00	1	176	82	1	18	2	4	1	0	0	0	0	0	285
07:00	**2**	**407**	**111**	13	**31**	**3**	2	2	0	0	0	0	0	**571**
08:00	1	292	78	**15**	27	2	**5**	1	2	0	0	0	0	423
09:00	1	170	55	4	21	2	4	2	5	0	0	0	0	264
10:00	2	191	65	4	19	3	5	**4**	**10**	0	0	0	0	303
11:00	0	211	81	7	20	3	3	4	4	0	0	0	0	333
12 PM	0	262	**87**	0	**27**	**4**	**8**	4	**8**	0	0	0	0	**400**
13:00	0	231	79	3	15	2	5	**6**	8	0	0	0	0	349
14:00	1	235	83	2	20	2	3	5	0	0	0	0	0	351
15:00	1	239	70	**7**	27	0	0	1	0	0	0	0	0	345
16:00	**5**	**290**	67	3	21	0	0	1	1	0	0	0	0	388
17:00	5	265	68	0	21	0	0	0	0	0	0	0	0	359
18:00	0	227	75	1	11	0	0	0	0	0	0	0	0	314
19:00	0	143	38	0	11	0	0	1	0	0	0	0	0	193
20:00	0	87	12	0	6	0	0	0	1	0	0	0	0	106
21:00	0	60	17	0	3	0	0	0	0	0	0	0	0	80
22:00	1	36	10	0	2	0	0	0	0	0	0	0	0	49
23:00	0	14	4	0	2	0	0	0	0	0	0	0	0	20
Day Total	22	3631	1130	61	322	25	41	32	39	0	0	0	0	5303
Percent	0.4%	68.5%	21.3%	1.2%	6.1%	0.5%	0.8%	0.6%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	07:00	07:00	08:00	10:00	10:00					07:00
Vol.	2	407	111	15	31	3	5	4	10					571
PM Peak	16:00	16:00	12:00	15:00	12:00	12:00	12:00	13:00	12:00					12:00
Vol.	5	290	87	7	27	4	8	6	8					400

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WB

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10/24/18	0	7	1	0	1	0	0	0	0	0	0	0	0	9
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
02:00	0	10	1	0	2	0	0	0	0	0	0	0	0	13
03:00	0	5	3	0	4	0	0	0	0	0	0	0	0	12
04:00	0	14	8	0	8	0	0	0	1	0	0	0	0	31
05:00	0	50	25	1	21	0	3	0	0	0	0	0	0	100
06:00	0	160	68	2	51	1	5	0	0	**3**	0	0	0	290
07:00	0	**383**	**121**	15	**64**	2	5	1	0	0	0	0	0	**591**
08:00	0	267	72	**21**	39	**3**	6	1	2	0	0	0	0	411
09:00	**1**	202	56	1	41	1	3	2	**7**	0	0	0	0	314
10:00	0	208	81	6	34	0	7	1	4	0	0	0	0	341
11:00	0	221	84	8	44	2	**13**	**8**	7	0	0	0	0	387
12 PM	0	204	81	3	44	0	4	3	**11**	0	0	0	0	350
13:00	1	220	80	5	48	**3**	**8**	1	2	0	0	0	0	368
14:00	3	207	92	3	44	2	4	**5**	0	0	0	0	0	360
15:00	1	244	**100**	**6**	**58**	1	1	3	1	0	0	0	0	**415**
16:00	0	**259**	88	1	47	1	0	0	0	0	0	0	0	396
17:00	**6**	239	81	0	34	1	0	0	0	0	0	0	0	361
18:00	1	189	66	0	24	0	0	2	0	0	0	0	0	282
19:00	1	134	54	0	20	0	0	0	0	0	0	0	0	209
20:00	0	122	40	0	15	1	0	0	0	0	0	0	0	178
21:00	0	51	16	0	7	0	0	0	0	0	0	0	0	74
22:00	0	23	12	0	3	0	0	0	0	0	0	0	0	38
23:00	0	17	9	0	3	0	0	0	0	0	0	0	0	29
Day Total	14	3440	1240	72	656	18	59	27	35	3	0	0	0	5564
Percent	0.3%	61.8%	22.3%	1.3%	11.8%	0.3%	1.1%	0.5%	0.6%	0.1%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	08:00	07:00	08:00	11:00	11:00	09:00	06:00				07:00
Vol.	1	383	121	21	64	3	13	8	7	3				591
PM Peak	17:00	16:00	15:00	15:00	15:00	13:00	13:00	14:00	12:00					15:00
Vol.	6	259	100	6	58	3	8	5	11					415

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WB

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10/25/18	0	12	1	0	0	0	0	0	0	0	0	0	0	13
01:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
03:00	1	4	6	1	1	0	0	0	0	0	0	0	0	13
04:00	0	10	8	0	8	0	0	0	0	0	0	0	0	26
05:00	2	48	19	1	31	2	0	0	0	0	0	0	0	103
06:00	0	138	62	2	58	3	3	2	0	0	0	0	0	268
07:00	2	**333**	**143**	13	**70**	0	5	**3**	0	0	0	0	0	**569**
08:00	1	262	101	**15**	58	1	2	1	0	0	0	0	0	441
09:00	1	186	73	1	51	3	**7**	2	**5**	0	0	0	0	329
10:00	0	179	88	3	47	2	2	3	4	0	0	0	0	328
11:00	**4**	206	91	6	44	**4**	5	1	3	0	0	0	0	364
12 PM	0	214	89	3	49	0	**7**	4	3	**1**	0	0	0	370
13:00	**2**	**265**	**90**	**6**	**54**	0	5	**5**	**5**	0	0	0	0	**432**
14:00	0	241	87	4	47	0	3	1	5	0	0	0	0	388
15:00	2	238	89	1	53	**1**	2	5	0	0	0	0	0	391
16:00	2	238	60	0	32	0	0	1	0	0	0	0	0	333
17:00	0	183	61	0	28	0	0	3	0	0	0	0	0	275
18:00	1	155	42	0	16	0	0	0	0	0	0	0	0	214
19:00	0	82	24	0	14	0	0	0	0	0	0	0	0	120
20:00	0	42	15	0	8	0	0	1	0	0	0	0	0	66
21:00	0	40	9	0	1	0	0	0	0	0	0	0	0	50
22:00	1	45	13	0	8	0	0	0	0	0	0	0	0	67
23:00	1	37	10	0	4	0	0	0	0	0	0	0	0	52
Day Total	20	3170	1181	56	683	16	41	32	25	1	0	0	0	5225
Percent	0.4%	60.7%	22.6%	1.1%	13.1%	0.3%	0.8%	0.6%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	08:00	07:00	11:00	09:00	07:00	09:00					07:00
Vol.	4	333	143	15	70	4	7	3	5					569
PM Peak	13:00	13:00	13:00	13:00	13:00	15:00	12:00	13:00	13:00	12:00				13:00
Vol.	2	265	90	6	54	1	7	5	5	1				432

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10/26/18	0	14	4	0	1	0	0	0	0	0	0	0	0	19
01:00	0	11	3	0	1	0	0	0	0	0	0	0	0	15
02:00	**1**	5	1	0	1	0	0	0	0	0	0	0	0	8
03:00	0	8	2	0	2	0	0	0	0	0	0	0	0	12
04:00	0	10	8	0	6	0	0	0	0	0	0	0	0	24
05:00	0	39	20	2	17	0	0	0	0	0	0	0	0	78
06:00	0	100	54	0	50	0	2	1	0	0	0	0	0	207
07:00	0	**269**	83	**3**	43	2	2	1	1	0	0	0	0	**404**
08:00	0	247	**84**	3	48	1	3	2	3	0	0	0	0	391
09:00	1	204	61	3	38	2	3	1	**7**	0	0	0	0	320
10:00	0	209	67	1	44	**4**	2	4	6	0	0	0	0	337
11:00	0	205	79	1	**54**	0	**6**	**5**	6	**1**	0	0	0	357
12 PM	1	**263**	**100**	**3**	41	1	1	**3**	5	**1**	0	0	0	**419**
13:00	0	226	87	3	45	**3**	**4**	1	2	0	0	0	0	371
14:00	2	234	68	3	**48**	0	4	2	**9**	0	0	0	0	370
15:00	0	244	91	0	39	0	0	1	1	0	0	0	0	376
16:00	**3**	225	63	0	35	1	0	2	0	0	0	0	0	329
17:00	0	222	58	0	30	0	0	1	1	0	0	0	0	312
18:00	0	174	49	0	21	0	0	0	0	0	0	0	0	244
19:00	0	115	21	1	16	0	0	0	0	0	0	0	0	153
20:00	0	82	20	0	7	0	0	0	0	0	0	0	0	109
21:00	2	61	14	0	7	0	0	0	0	0	0	0	0	84
22:00	0	70	10	0	2	0	0	0	0	0	0	0	0	82
23:00	0	27	1	0	3	0	0	0	0	0	0	0	0	31
Day Total	10	3264	1048	23	599	14	27	24	41	2	0	0	0	5052
Percent	0.2%	64.6%	20.7%	0.5%	11.9%	0.3%	0.5%	0.5%	0.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak	02:00	07:00	08:00	07:00	11:00	10:00	11:00	11:00	09:00	11:00				07:00
Vol.	1	269	84	3	54	4	6	5	7	1				404
PM Peak	16:00	12:00	12:00	12:00	14:00	13:00	13:00	12:00	14:00	12:00				12:00
Vol.	3	263	100	3	48	3	4	3	9	1				419

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WB

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10/27/18	0	15	2	0	0	0	0	0	**1**	0	0	0	0	18
01:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	8	3	0	4	0	0	0	0	0	0	0	0	15
04:00	0	3	3	0	0	0	0	0	0	0	0	0	0	6
05:00	0	28	9	0	15	0	0	0	0	0	0	0	0	52
06:00	0	33	12	0	6	0	0	0	0	0	0	0	0	51
07:00	0	61	15	0	10	0	0	0	0	0	0	0	0	86
08:00	**1**	137	23	**1**	11	0	**2**	0	0	0	0	0	0	175
09:00	0	201	44	1	27	0	0	**1**	0	0	0	0	0	274
10:00	0	224	**64**	0	24	0	1	0	0	0	0	0	0	313
11:00	0	**248**	52	1	**32**	**1**	0	0	0	0	0	0	0	**334**
12 PM	0	**233**	71	0	**34**	0	0	**1**	0	0	0	0	0	**339**
13:00	0	205	**72**	**1**	30	0	0	0	0	0	0	0	0	308
14:00	**1**	194	47	0	21	0	0	0	0	0	0	0	0	263
15:00	1	190	51	0	14	0	0	0	0	0	0	0	0	256
16:00	0	170	42	0	23	0	0	0	0	0	0	0	0	235
17:00	0	130	32	0	13	0	0	0	0	0	0	0	0	175
18:00	0	131	21	0	7	0	0	0	0	0	0	0	0	159
19:00	0	100	22	0	11	0	0	0	0	0	0	0	0	133
20:00	0	90	12	0	8	**1**	0	0	0	0	0	0	0	111
21:00	0	60	8	0	2	0	0	0	0	0	0	0	0	70
22:00	0	59	6	0	4	0	0	0	0	0	0	0	0	69
23:00	0	32	3	0	1	0	0	0	0	0	0	0	0	36
Day Total	3	2571	617	4	298	2	3	2	1	0	0	0	0	3501
Percent	0.1%	73.4%	17.6%	0.1%	8.5%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	10:00	08:00	11:00	11:00	08:00	09:00	00:00					11:00
Vol.	1	248	64	1	32	1	2	1	1					334
PM Peak	14:00	12:00	13:00	13:00	12:00	20:00		12:00						12:00
Vol.	1	233	72	1	34	1		1						339

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/28/18	0	17	3	0	2	0	0	0	0	0	0	0	0	22
01:00	0	17	3	0	1	0	0	0	0	0	0	0	0	21
02:00	0	27	2	0	1	0	0	0	0	0	0	0	0	30
03:00	0	9	0	0	1	0	0	0	0	0	0	0	0	10
04:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
05:00	0	14	3	0	1	0	0	0	0	0	0	0	0	18
06:00	0	21	7	0	3	0	0	0	0	0	0	0	0	31
07:00	0	45	10	0	5	0	0	0	0	0	0	0	0	60
08:00	0	72	14	0	7	0	0	0	0	0	0	0	0	93
09:00	0	127	24	0	**16**	0	0	0	0	0	0	0	0	167
10:00	0	134	26	0	16	0	0	0	0	0	0	0	0	176
11:00	0	**141**	**33**	0	16	0	0	**1**	0	0	0	0	0	**191**
12 PM	0	**212**	40	**1**	20	0	0	0	0	0	0	0	0	**273**
13:00	**2**	174	33	0	18	0	0	0	0	0	0	0	0	227
14:00	0	174	33	0	**23**	0	0	0	0	0	0	0	0	230
15:00	0	160	40	0	19	0	0	**1**	0	0	0	0	0	220
16:00	0	171	**44**	0	12	0	0	0	0	0	0	0	0	227
17:00	1	125	33	0	15	0	0	0	0	0	0	0	0	174
18:00	0	104	21	0	9	0	0	0	0	0	0	0	0	134
19:00	0	84	20	0	11	0	0	0	0	0	0	0	0	115
20:00	0	58	9	0	3	0	0	0	0	0	0	0	0	70
21:00	0	46	10	0	4	0	0	0	0	0	0	0	0	60
22:00	0	25	8	0	1	0	0	0	0	0	0	0	0	34
23:00	0	17	3	0	3	0	0	0	0	0	0	0	0	23
Day Total	3	1980	421	1	207	0	0	2	0	0	0	0	0	2614
Percent	0.1%	75.7%	16.1%	0.0%	7.9%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00		09:00			11:00						11:00
Vol.		141	33		16			1						191
PM Peak	13:00	12:00	16:00	12:00	14:00			15:00						12:00
Vol.	2	212	44	1	23			1						273

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/29/18	0	8	2	0	0	0	0	0	0	0	0	0	0	10
01:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
02:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
03:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
04:00	0	12	6	0	6	0	0	0	0	0	0	0	0	24
05:00	0	50	23	2	22	0	0	0	0	0	0	0	0	97
06:00	0	171	72	0	33	0	1	0	0	0	0	0	0	277
07:00	**1**	**377**	**96**	**15**	**45**	1	**7**	0	0	0	0	0	0	**542**
08:00	0	305	72	14	28	1	3	0	2	0	0	0	0	425
09:00	0	184	54	4	43	1	6	1	**7**	0	0	0	0	300
10:00	0	180	61	5	30	**3**	7	1	7	0	0	0	0	294
11:00	0	202	60	6	31	1	4	**3**	5	0	0	0	0	312
12 PM	1	272	80	4	36	**6**	**12**	**2**	**17**	0	0	0	0	430
13:00	0	234	72	**8**	37	5	7	2	10	0	0	0	0	375
14:00	1	218	49	5	27	2	0	2	0	0	0	0	0	304
15:00	4	293	**93**	4	36	3	1	0	0	0	0	0	0	434
16:00	**6**	**305**	81	2	**43**	0	0	0	0	0	0	0	0	**437**
17:00	3	288	66	0	37	2	0	0	0	0	0	0	0	396
18:00	0	177	43	0	19	0	0	0	0	0	0	0	0	239
19:00	1	150	28	0	13	0	0	0	0	0	0	0	0	192
20:00	0	77	28	0	9	0	0	0	0	0	0	0	0	114
21:00	0	63	9	0	4	0	0	0	0	0	0	0	0	76
22:00	0	26	8	0	2	0	0	0	0	0	0	0	0	36
23:00	0	20	4	0	0	0	0	0	0	0	0	0	0	24
Day Total	17	3628	1009	69	503	25	48	11	48	0	0	0	0	5358
Percent	0.3%	67.7%	18.8%	1.3%	9.4%	0.5%	0.9%	0.2%	0.9%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	10:00	07:00	11:00	09:00					07:00
Vol.	1	377	96	15	45	3	7	3	7					542
PM Peak	16:00	16:00	15:00	13:00	16:00	12:00	12:00	12:00	12:00					16:00
Vol.	6	305	93	8	43	6	12	2	17					437

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/30/18	0	10	3	0	1	0	0	0	0	0	0	0	0	14
01:00	0	5	2	0	1	0	0	0	0	0	0	0	0	8
02:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
03:00	0	8	0	0	3	0	0	0	0	0	0	0	0	11
04:00	0	18	10	0	2	1	1	0	0	0	0	0	0	32
05:00	0	53	25	0	27	1	1	0	0	0	0	0	0	107
06:00	0	179	79	1	30	1	**11**	0	0	0	0	0	0	301
07:00	1	**413**	**103**	15	40	2	0	2	1	0	0	0	0	**577**
08:00	3	290	74	**17**	**41**	1	2	0	2	0	0	0	0	430
09:00	0	210	63	3	26	**4**	4	**5**	1	0	0	0	0	316
10:00	0	193	52	8	32	3	7	1	**4**	0	0	0	0	300
11:00	**5**	228	74	5	31	3	9	2	4	0	0	0	0	361
12 PM	1	268	75	2	37	1	**9**	2	6	0	0	0	0	401
13:00	1	263	72	6	23	**4**	5	**5**	**13**	0	0	0	0	392
14:00	3	255	81	4	**49**	0	2	5	7	0	0	0	0	406
15:00	**4**	**277**	**113**	**7**	32	1	1	3	0	0	0	0	0	**438**
16:00	1	262	79	3	34	0	0	1	1	0	0	0	0	381
17:00	4	256	68	1	31	1	0	1	0	0	0	0	0	362
18:00	2	196	58	0	24	0	0	2	0	0	0	0	0	282
19:00	1	136	44	0	19	0	0	1	0	0	0	0	0	201
20:00	0	83	13	0	10	0	0	0	0	0	0	0	0	106
21:00	0	52	8	0	3	0	0	0	0	0	0	0	0	63
22:00	1	32	7	0	1	0	0	0	0	0	0	0	0	41
23:00	0	16	8	0	3	0	0	0	0	0	0	0	0	27
Day Total	27	3708	1111	72	501	23	52	30	39	0	0	0	0	5563
Percent	0.5%	66.7%	20.0%	1.3%	9.0%	0.4%	0.9%	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	08:00	08:00	09:00	06:00	09:00	10:00					07:00
Vol.	5	413	103	17	41	4	11	5	4					577
PM Peak	15:00	15:00	15:00	15:00	14:00	13:00	12:00	13:00	13:00					15:00
Vol.	4	277	113	7	49	4	9	5	13					438

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/31/18	0	11	5	0	1	0	0	0	0	0	0	0	0	17
01:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	7	4	0	1	0	0	0	0	0	0	0	0	12
04:00	0	15	5	0	2	0	0	0	0	0	0	0	0	22
05:00	0	45	27	0	22	0	0	0	0	0	0	0	0	94
06:00	0	178	66	2	**39**	1	1	0	0	**1**	0	0	0	288
07:00	1	**381**	**97**	15	38	1	1	**2**	0	0	0	0	0	**536**
08:00	1	305	83	**16**	24	0	**3**	1	2	0	0	0	0	435
09:00	0	230	53	1	22	**4**	3	2	1	0	0	0	0	316
10:00	0	280	65	2	20	3	2	2	2	0	0	0	0	376
11:00	**3**	246	58	4	20	2	2	2	**3**	0	0	0	0	340
12 PM	2	241	53	4	16	**2**	2	1	**2**	0	0	0	0	323
13:00	2	260	49	**5**	**21**	0	**4**	**3**	1	0	0	0	0	345
14:00	2	**315**	75	1	19	1	2	1	1	0	0	0	0	**417**
15:00	5	291	**85**	5	17	2	2	1	0	0	0	0	0	408
16:00	**7**	232	57	0	18	1	0	0	0	0	0	0	0	315
17:00	3	239	48	0	14	0	0	0	0	0	0	0	0	304
18:00	0	160	23	0	19	0	0	0	0	0	0	0	0	202
19:00	0	122	32	0	9	0	1	0	0	0	0	0	0	164
20:00	0	143	22	0	6	0	0	0	0	0	0	0	0	171
21:00	0	48	5	0	1	0	0	0	0	0	0	0	0	54
22:00	1	31	8	0	0	0	0	0	0	0	0	0	0	40
23:00	0	16	4	0	0	0	0	0	0	0	0	0	0	20
Day Total	27	3808	925	55	330	17	23	15	12	1	0	0	0	5213
Percent	0.5%	73.0%	17.7%	1.1%	6.3%	0.3%	0.4%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	08:00	06:00	09:00	08:00	07:00	11:00	06:00				07:00
Vol.	3	381	97	16	39	4	3	2	3	1				536
PM Peak	16:00	14:00	15:00	13:00	13:00	12:00	13:00	13:00	12:00					14:00
Vol.	7	315	85	5	21	2	4	3	2					417

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: West of Dorsey Rd
Weather: Varied
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/01/18	0	14	4	0	0	0	0	0	0	0	0	0	0	18
01:00	1	8	2	0	0	0	0	0	0	0	0	0	0	11
02:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
03:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
04:00	0	11	9	0	3	0	0	0	0	0	0	0	0	23
05:00	0	49	35	1	10	1	0	0	0	0	0	0	0	96
06:00	0	185	68	0	17	2	**4**	0	0	0	0	0	0	276
07:00	1	**427**	**84**	**16**	**26**	2	4	0	0	0	0	0	0	**560**
08:00	**4**	348	58	13	26	2	2	1	1	0	0	0	0	455
09:00	0	229	66	0	17	3	4	**5**	**4**	0	0	0	0	328
10:00	4	221	60	3	16	1	3	4	3	0	0	0	0	315
11:00	2	236	79	4	16	**5**	2	4	4	0	0	0	0	352
12 PM	2	290	63	2	9	2	4	1	7	**1**	0	0	0	381
13:00	1	270	70	2	12	1	**6**	**4**	6	0	0	0	0	372
14:00	**8**	260	55	**3**	15	1	4	2	**8**	0	0	0	0	356
15:00	5	**307**	**76**	1	**27**	**3**	0	3	1	0	0	0	0	**423**
16:00	8	292	53	3	10	0	0	1	1	0	0	0	**1**	369
17:00	3	304	51	0	11	0	0	0	0	0	0	0	0	369
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	39	3471	836	48	215	23	33	25	35	1	0	0	1	4727
Percent	0.8%	73.4%	17.7%	1.0%	4.5%	0.5%	0.7%	0.5%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	07:00	07:00	11:00	06:00	09:00	09:00					07:00
Vol.	4	427	84	16	26	5	4	5	4					560
PM Peak	14:00	15:00	15:00	14:00	15:00	15:00	13:00	13:00	14:00	12:00			16:00	15:00
Vol.	8	307	76	3	27	3	6	4	8	1			1	423
Grand Total	252	41316	11654	515	4814	184	372	240	337	12	0	0	1	59697
Percent	0.4%	69.2%	19.5%	0.9%	8.1%	0.3%	0.6%	0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/19/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	**2**	**11**	**4**	1	5	**21**	**55**	**26**	**7**	1	0	0	0	0	**133**	47	50
22:00	0	3	1	**2**	**7**	21	26	18	4	**2**	0	0	0	0	84	48	52
23:00	2	3	2	0	3	7	12	15	2	1	**1**	0	0	0	48	48	54
Total	4	17	7	3	15	49	93	59	13	4	1	0	0	0	265		
Percent	1.5%	6.4%	2.6%	1.1%	5.7%	18.5%	35.1%	22.3%	4.9%	1.5%	0.4%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	21:00	21:00	21:00	22:00	22:00	21:00	21:00	21:00	21:00	22:00	23:00				21:00		
Vol.	2	11	4	2	7	21	55	26	7	2	1				133		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/20/18	0	2	1	0	2	6	9	4	2	0	0	0	0	0	26	47	51
01:00	0	1	0	0	1	5	4	9	1	0	0	0	0	0	21	48	49
02:00	0	2	1	0	0	1	3	4	0	0	0	0	0	0	11	47	49
03:00	0	0	0	0	0	0	3	1	1	0	0	0	0	0	5	51	53
04:00	0	0	1	0	0	0	6	1	2	0	0	0	0	0	10	51	53
05:00	1	3	0	0	0	2	2	3	0	0	0	0	0	0	11	47	49
06:00	0	8	2	0	0	4	8	11	4	3	0	0	0	0	40	51	56
07:00	1	6	2	1	2	12	25	11	6	0	0	0	0	0	66	48	52
08:00	2	7	2	0	2	12	32	27	9	1	0	0	0	0	94	49	52
09:00	5	2	**9**	5	0	17	57	52	13	3	0	0	0	0	163	49	53
10:00	4	**11**	8	**7**	**12**	41	73	58	**26**	**5**	0	0	0	0	245	49	53
11:00	**7**	9	5	6	3	**53**	**93**	**64**	22	1	**1**	0	0	0	**264**	48	52
12 PM	**14**	**15**	6	3	14	**58**	**143**	82	15	6	0	0	0	0	**356**	48	51
13:00	3	7	**10**	**12**	10	38	103	95	9	**10**	**1**	0	0	0	298	48	52
14:00	6	9	4	2	**19**	38	104	94	22	2	0	**1**	**1**	0	302	48	52
15:00	7	5	7	2	11	28	73	**96**	29	2	0	1	0	0	261	49	53
16:00	2	9	5	0	9	26	79	78	**37**	2	1	0	0	0	248	50	53
17:00	5	11	6	4	1	27	86	77	16	4	0	0	0	0	237	48	52
18:00	7	9	8	7	17	46	73	48	8	1	0	0	1	0	225	47	49
19:00	1	7	4	2	11	47	48	33	9	1	0	0	0	0	163	47	51
20:00	1	1	1	1	1	16	48	25	5	3	0	0	0	0	102	48	52
21:00	0	7	4	1	2	24	39	26	8	0	1	0	0	0	112	48	52
22:00	0	5	1	1	3	13	21	19	10	0	0	0	0	0	73	49	53
23:00	0	4	2	1	0	5	10	12	10	0	0	0	0	0	44	51	53
Total	66	140	89	55	120	519	1142	930	264	44	4	2	2	0	3377		
Percent	2.0%	4.1%	2.6%	1.6%	3.6%	15.4%	33.8%	27.5%	7.8%	1.3%	0.1%	0.1%	0.1%	0.0%			
AM Peak	11:00	10:00	09:00	10:00	10:00	11:00	11:00	11:00	10:00	10:00	11:00				11:00		
Vol.	7	11	9	7	12	53	93	64	26	5	1				264		
PM Peak	12:00	12:00	13:00	13:00	14:00	12:00	12:00	15:00	16:00	13:00	13:00	14:00	14:00		12:00		
Vol.	14	15	10	12	19	58	143	96	37	10	1	1	1		356		

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/21/18	1	0	1	1	0	6	9	11	2	2	0	0	0	0	33	49	55
01:00	0	2	0	0	0	2	2	4	4	1	0	0	0	0	15	53	56
02:00	0	0	0	0	0	3	2	6	2	1	0	0	0	0	14	52	56
03:00	0	2	0	0	0	1	2	2	1	0	**1**	0	0	0	9	53	62
04:00	0	0	0	0	0	2	1	1	0	0	0	0	0	0	4	47	48
05:00	1	3	1	0	0	1	2	1	1	0	1	0	0	0	11	51	62
06:00	0	4	2	0	3	3	1	1	1	0	0	**1**	0	0	16	47	65
07:00	1	4	1	0	1	5	12	12	6	1	0	0	0	0	43	50	54
08:00	2	7	1	0	1	5	13	12	13	5	0	0	0	0	59	53	57
09:00	**4**	9	2	0	2	**17**	34	29	12	**7**	0	1	0	0	117	51	56
10:00	1	6	**7**	0	2	14	53	**55**	24	4	1	0	0	0	167	50	54
11:00	1	**13**	4	**3**	**8**	16	**62**	53	**25**	7	0	0	0	0	**192**	50	54
12 PM	2	**13**	**10**	2	8	33	86	74	15	8	0	0	0	0	251	49	53
13:00	3	10	3	0	3	27	81	**105**	**25**	4	0	0	0	0	261	49	53
14:00	**9**	12	10	1	12	35	**108**	72	15	3	0	0	0	0	**277**	48	51
15:00	5	10	8	8	6	28	77	71	24	5	1	0	0	0	243	49	53
16:00	6	13	10	**13**	16	21	78	80	23	**9**	**4**	0	0	0	273	49	54
17:00	0	9	5	8	12	**46**	83	56	24	1	2	**1**	**1**	0	248	49	53
18:00	1	11	5	3	**19**	24	51	60	20	3	0	0	0	0	197	49	53
19:00	3	6	6	1	2	16	56	37	9	2	0	0	0	0	138	48	52
20:00	1	9	2	2	0	20	30	40	7	0	0	0	0	0	111	48	51
21:00	0	4	0	1	0	11	30	19	6	2	1	0	0	0	74	49	54
22:00	0	2	2	0	2	4	12	13	11	1	0	0	0	0	47	52	54
23:00	0	1	0	0	0	4	5	3	1	0	0	0	0	0	14	48	51
Total	41	150	80	43	97	344	890	817	271	66	11	3	1	0	2814		
Percent	1.5%	5.3%	2.8%	1.5%	3.4%	12.2%	31.6%	29.0%	9.6%	2.3%	0.4%	0.1%	0.0%	0.0%			
AM Peak	09:00	11:00	10:00	11:00	11:00	09:00	11:00	10:00	11:00	09:00	03:00	06:00			11:00		
Vol.	4	13	7	3	8	17	62	55	25	7	1	1			192		
PM Peak	14:00	12:00	12:00	16:00	18:00	17:00	14:00	13:00	13:00	16:00	16:00	17:00	17:00		14:00		
Vol.	9	13	10	13	19	46	108	105	25	9	4	1	1		277		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/22/18	0	0	0	0	0	1	3	3	0	0	1	0	0	0	8	49	62
01:00	0	0	1	0	0	2	6	2	1	1	1	0	0	0	14	54	61
02:00	0	2	0	0	1	1	3	0	2	0	0	0	0	0	9	51	53
03:00	0	1	0	0	0	0	1	1	1	0	0	0	0	0	4	52	54
04:00	0	2	0	0	0	0	3	3	3	0	0	0	0	0	11	52	54
05:00	3	6	0	0	0	1	10	9	4	2	0	0	0	0	35	50	55
06:00	2	11	9	2	3	11	23	21	7	4	1	0	0	0	94	49	55
07:00	21	17	9	13	22	**80**	85	56	9	2	0	0	0	0	314	46	49
08:00	**41**	**22**	**25**	**27**	**43**	79	108	59	17	3	0	0	0	0	**424**	46	49
09:00	14	6	16	12	27	40	92	**82**	24	**7**	1	0	0	0	321	49	53
10:00	6	7	6	0	5	26	72	78	**39**	7	0	0	0	0	246	51	54
11:00	13	8	11	7	27	60	**124**	74	23	2	**2**	0	0	0	351	48	52
12 PM	13	4	14	13	17	34	116	**89**	**32**	**7**	0	0	**1**	0	340	49	53
13:00	13	13	3	7	11	53	101	67	24	3	0	0	0	0	295	48	52
14:00	77	24	21	20	38	92	102	59	17	4	0	0	0	0	454	46	49
15:00	58	17	19	33	37	**102**	118	46	10	1	0	0	0	0	441	44	48
16:00	199	29	24	26	**51**	62	86	32	14	3	1	0	0	0	527	43	48
17:00	**235**	**49**	**38**	**35**	35	48	62	32	12	0	0	0	0	0	**546**	41	47
18:00	10	17	10	11	8	73	**151**	86	17	3	1	0	0	0	387	47	50
19:00	4	8	9	6	10	57	111	55	16	2	0	**1**	0	0	279	47	51
20:00	0	5	3	2	5	17	40	69	25	6	**3**	0	0	0	175	51	55
21:00	0	2	1	2	3	5	19	31	8	3	1	0	0	0	75	50	55
22:00	1	4	1	1	1	2	16	11	7	2	0	0	0	0	46	51	54
23:00	0	3	3	0	0	1	11	10	6	3	0	0	0	0	37	52	56
Total	710	257	223	217	344	847	1463	975	318	65	12	1	1	0	5433		
Percent	13.1%	4.7%	4.1%	4.0%	6.3%	15.6%	26.9%	17.9%	5.9%	1.2%	0.2%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00	11:00	09:00	10:00	09:00	11:00				08:00		
Vol.	41	22	25	27	43	80	124	82	39	7	2				424		
PM Peak	17:00	17:00	17:00	17:00	16:00	15:00	18:00	12:00	12:00	12:00	20:00	19:00	12:00		17:00		
Vol.	235	49	38	35	51	102	151	89	32	7	3	1	1		546		

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Longitude: 0' 0.0000 Undefined
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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/23/18	0	0	0	0	0	4	4	6	3	0	**2**	0	0	0	19	53	62
01:00	0	2	0	0	0	1	4	1	1	1	0	0	0	0	10	52	57
02:00	0	0	0	0	0	0	2	3	0	1	0	0	0	0	6	55	58
03:00	0	1	0	0	0	0	2	0	1	0	0	0	0	0	4	52	54
04:00	0	0	2	0	0	2	4	3	2	1	0	**1**	0	0	15	54	66
05:00	2	5	1	0	1	1	6	9	5	1	0	0	0	0	31	51	54
06:00	6	8	5	1	4	15	23	11	13	1	0	0	0	0	87	50	53
07:00	**19**	9	14	6	20	**66**	109	59	14	2	0	0	0	0	318	47	50
08:00	14	**21**	**15**	**10**	**23**	27	80	50	19	4	0	0	0	0	263	48	52
09:00	2	4	12	0	5	28	64	84	**34**	6	1	0	0	0	240	50	54
10:00	3	12	7	2	5	31	67	61	24	**10**	0	0	0	0	222	50	54
11:00	5	7	12	10	12	40	**124**	**94**	21	5	1	0	0	0	**331**	48	52
12 PM	19	9	6	7	12	64	97	**82**	**30**	3	0	0	0	0	329	49	52
13:00	15	9	8	1	27	38	**116**	79	16	**6**	**3**	0	0	0	318	48	52
14:00	102	34	33	27	38	53	104	47	13	5	0	0	0	0	456	44	49
15:00	73	28	**35**	**37**	**42**	**77**	108	59	10	2	1	0	0	0	472	45	49
16:00	214	36	22	25	28	49	71	34	9	1	0	0	0	0	489	42	47
17:00	**302**	**39**	28	30	27	44	43	22	5	4	1	0	0	0	**545**	39	46
18:00	27	16	5	12	23	69	97	81	24	2	1	0	0	0	357	48	51
19:00	6	11	7	7	21	47	91	69	15	2	1	0	0	0	277	48	51
20:00	2	4	4	1	8	38	74	41	20	3	1	0	0	0	196	49	53
21:00	0	2	3	0	2	16	38	33	19	5	1	0	0	0	119	51	55
22:00	10	0	0	0	3	5	7	9	2	0	0	0	0	0	36	48	50
23:00	0	3	0	1	0	1	14	15	5	1	0	0	0	0	40	50	54
Total	821	260	219	177	301	716	1349	952	305	66	13	1	0	0	5180		
Percent	15.8%	5.0%	4.2%	3.4%	5.8%	13.8%	26.0%	18.4%	5.9%	1.3%	0.3%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	08:00	07:00	11:00	11:00	09:00	10:00	00:00	04:00			11:00		
Vol.	19	21	15	10	23	66	124	94	34	10	2	1			331		
PM Peak	17:00	17:00	15:00	15:00	15:00	15:00	13:00	12:00	12:00	13:00	13:00				17:00		
Vol.	302	39	35	37	42	77	116	82	30	6	3				545		

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Longitude: 0' 0.0000 Undefined
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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/24/18	0	2	0	0	0	3	4	6	2	0	0	0	0	0	17	49	52
01:00	0	0	0	0	1	0	2	3	2	1	0	0	0	0	9	54	57
02:00	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	42	44
03:00	0	1	0	0	0	1	1	1	1	0	0	0	0	0	5	51	53
04:00	0	5	0	0	1	1	4	3	4	2	0	0	0	0	20	53	57
05:00	3	8	0	0	0	4	8	7	7	3	0	0	0	0	40	52	56
06:00	4	**18**	5	0	1	8	19	24	12	1	0	0	0	0	92	49	53
07:00	**19**	13	7	4	9	41	122	70	17	2	0	0	0	0	304	48	51
08:00	18	8	10	3	6	34	88	64	**28**	1	0	0	0	0	260	49	52
09:00	9	10	**12**	**5**	20	30	63	**75**	16	**4**	0	0	0	0	244	48	52
10:00	11	5	8	5	4	68	104	53	21	4	0	0	0	0	283	48	52
11:00	18	7	3	3	**25**	**93**	**154**	74	14	0	0	0	0	0	**391**	46	49
12 PM	20	10	13	22	29	77	113	**80**	**24**	**2**	0	0	0	0	390	47	51
13:00	15	10	13	8	19	71	118	77	20	2	**1**	0	0	0	354	48	51
14:00	71	14	11	23	45	95	113	54	15	1	0	0	0	0	442	45	49
15:00	20	8	22	18	37	**99**	**156**	71	8	1	1	0	0	0	441	46	49
16:00	194	32	**35**	**68**	**49**	50	58	21	7	0	0	0	0	0	514	40	45
17:00	**397**	**51**	27	15	7	22	28	14	1	0	0	0	0	0	**562**	25	42
18:00	9	9	8	4	14	82	139	80	16	0	1	0	0	0	362	47	49
19:00	5	8	5	8	33	67	93	58	12	2	1	0	0	0	292	47	50
20:00	3	7	3	6	4	25	56	54	20	1	0	0	0	0	179	49	53
21:00	2	4	6	1	1	13	39	36	16	0	1	0	0	0	119	49	53
22:00	0	4	1	1	1	4	23	9	5	2	0	0	0	0	50	49	54
23:00	1	4	0	1	0	10	13	16	2	0	0	0	0	0	47	48	49
Total	819	238	189	195	307	899	1519	950	270	29	5	0	0	0	5420		
Percent	15.1%	4.4%	3.5%	3.6%	5.7%	16.6%	28.0%	17.5%	5.0%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	06:00	09:00	09:00	11:00	11:00	11:00	09:00	08:00	09:00					11:00		
Vol.	19	18	12	5	25	93	154	75	28	4					391		
PM Peak	17:00	17:00	16:00	16:00	16:00	15:00	15:00	12:00	12:00	12:00	13:00				17:00		
Vol.	397	51	35	68	49	99	156	80	24	2	1				562		

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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/25/18	1	0	1	1	0	4	5	8	7	0	0	0	0	0	27	52	54
01:00	0	1	0	0	0	0	1	5	2	2	0	0	0	0	11	55	58
02:00	0	2	0	0	0	0	3	0	1	2	**1**	0	0	**1**	10	59	62
03:00	0	0	1	0	0	1	0	4	3	0	0	0	0	0	9	52	54
04:00	1	3	0	0	2	2	1	5	2	1	0	0	0	0	17	51	55
05:00	3	5	0	0	0	3	11	9	5	0	0	0	0	0	36	49	53
06:00	9	11	8	2	6	10	19	19	5	5	0	0	0	0	94	48	55
07:00	17	**14**	13	11	**20**	72	99	61	8	0	0	0	0	0	315	46	49
08:00	**31**	11	**18**	6	17	40	56	61	22	4	1	1	0	0	268	49	53
09:00	7	8	7	5	7	22	70	79	28	5	1	**2**	0	0	241	49	54
10:00	9	7	4	2	7	23	96	**94**	**29**	**9**	1	0	0	0	281	49	54
11:00	12	11	11	**15**	18	**80**	**135**	94	20	4	1	0	0	0	**401**	48	51
12 PM	**298**	**36**	25	24	44	40	37	28	4	2	0	0	0	0	**538**	38	46
13:00	112	26	13	10	21	72	87	73	25	3	0	0	0	0	442	47	51
14:00	20	9	5	6	20	67	128	**102**	24	**5**	1	0	0	0	387	48	52
15:00	102	23	**46**	**44**	**65**	77	95	43	13	3	0	0	0	0	511	44	48
16:00	85	26	37	35	50	96	120	58	14	2	0	0	0	0	523	44	49
17:00	15	9	11	6	42	**116**	**164**	81	16	4	1	**1**	0	0	466	47	49
18:00	5	7	6	5	5	45	84	76	**32**	4	0	0	0	0	269	49	53
19:00	5	12	2	4	7	10	71	38	10	3	1	0	0	0	163	48	52
20:00	0	6	2	1	2	15	31	42	13	2	1	0	0	0	115	49	53
21:00	1	4	0	1	5	12	21	41	16	3	**2**	0	0	0	106	51	54
22:00	0	2	1	0	0	14	35	27	10	1	1	0	0	0	91	49	53
23:00	0	1	1	0	5	12	23	18	5	0	1	0	0	0	66	48	52
Total	733	234	212	178	343	833	1392	1066	314	64	13	4	0	1	5387		
Percent	13.6%	4.3%	3.9%	3.3%	6.4%	15.5%	25.8%	19.8%	5.8%	1.2%	0.2%	0.1%	0.0%	0.0%			
AM Peak	08:00	07:00	08:00	11:00	07:00	11:00	11:00	10:00	10:00	10:00	02:00	09:00		02:00	11:00		
Vol.	31	14	18	15	20	80	135	94	29	9	1	2		1	401		
PM Peak	12:00	12:00	15:00	15:00	15:00	17:00	17:00	14:00	18:00	14:00	21:00	17:00			12:00		
Vol.	298	36	46	44	65	116	164	102	32	5	2	1			538		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/26/18	0	2	0	0	0	0	9	4	4	1	0	0	0	0	20	52	55
01:00	0	1	0	0	0	0	7	3	2	1	0	0	0	0	14	52	56
02:00	0	1	0	0	0	3	1	3	1	1	0	0	0	0	10	52	57
03:00	0	2	0	0	0	0	0	0	1	0	0	0	0	0	3	52	54
04:00	0	4	0	0	0	1	1	4	2	0	**1**	0	0	0	13	52	61
05:00	1	7	1	0	0	3	5	10	4	3	1	0	0	0	35	53	58
06:00	2	**16**	2	1	0	4	12	14	12	3	0	0	0	0	66	52	54
07:00	17	11	4	0	6	31	66	47	14	3	0	0	0	0	199	48	52
08:00	9	12	8	6	2	15	65	75	22	3	1	0	0	0	218	49	53
09:00	5	14	**10**	0	3	31	72	**84**	27	**6**	0	0	0	0	252	49	53
10:00	5	7	4	4	16	25	95	79	**31**	4	0	0	0	0	270	49	53
11:00	**20**	7	3	**16**	**27**	**99**	**155**	55	16	0	0	0	0	0	**398**	46	49
12 PM	20	16	7	6	18	**102**	134	88	10	1	0	0	0	0	402	47	49
13:00	17	16	7	21	22	67	127	**89**	15	1	0	0	0	0	382	47	49
14:00	13	7	12	9	27	87	**141**	74	**20**	2	0	0	0	0	392	47	50
15:00	113	**32**	**22**	21	**52**	81	118	68	8	0	0	0	0	0	**515**	44	48
16:00	**274**	26	18	16	31	44	68	25	3	1	0	0	0	0	506	41	45
17:00	58	21	19	**36**	47	92	114	49	8	**3**	0	0	0	0	447	44	48
18:00	7	12	4	2	19	66	128	45	16	0	0	0	0	0	299	46	50
19:00	4	7	4	2	7	54	82	49	9	0	0	0	0	0	218	47	49
20:00	2	8	2	6	7	27	43	42	7	2	0	0	0	0	146	48	51
21:00	3	8	5	0	5	16	33	27	6	0	**1**	0	0	0	104	48	51
22:00	1	7	2	1	4	15	42	22	2	0	0	0	0	0	96	47	49
23:00	0	3	0	0	1	6	12	12	3	1	0	**1**	0	0	39	49	55
Total	571	247	134	147	294	869	1530	968	243	36	4	1	0	0	5044		
Percent	11.3%	4.9%	2.7%	2.9%	5.8%	17.2%	30.3%	19.2%	4.8%	0.7%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	06:00	09:00	11:00	11:00	11:00	11:00	09:00	10:00	09:00	04:00				11:00		
Vol.	20	16	10	16	27	99	155	84	31	6	1				398		
PM Peak	16:00	15:00	15:00	17:00	15:00	12:00	14:00	13:00	14:00	17:00	21:00	23:00			15:00		
Vol.	274	32	22	36	52	102	141	89	20	3	1	1			515		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/27/18	1	5	0	0	1	6	4	0	3	0	0	0	0	0	20	50	53
01:00	0	2	1	0	0	5	7	1	2	0	0	0	0	0	18	46	52
02:00	0	1	0	0	0	2	4	3	0	1	0	0	0	0	11	48	57
03:00	0	2	0	0	1	1	0	1	1	0	0	0	0	0	6	50	53
04:00	0	4	0	0	1	3	1	1	0	1	0	0	0	0	11	46	57
05:00	0	3	0	0	0	1	1	3	1	0	0	0	0	0	9	49	52
06:00	2	1	0	1	3	2	3	11	5	1	**1**	0	0	0	30	52	57
07:00	1	5	1	0	1	6	22	14	2	1	0	0	0	0	53	48	50
08:00	4	**11**	1	1	1	7	27	33	10	2	0	0	0	0	97	49	53
09:00	4	10	5	2	6	24	52	62	18	3	1	0	0	0	187	49	53
10:00	**9**	8	5	**3**	**16**	24	100	**81**	**28**	**5**	1	0	0	0	280	49	53
11:00	9	10	**7**	1	15	**53**	**120**	80	16	1	0	0	0	0	**312**	48	50
12 PM	**12**	9	7	**12**	**31**	**91**	117	76	9	2	0	0	0	0	**366**	47	49
13:00	6	9	4	1	11	66	95	87	**27**	5	**1**	0	0	0	312	49	53
14:00	8	**20**	6	4	7	44	104	**91**	26	3	0	0	0	0	313	49	52
15:00	8	9	7	3	12	30	91	88	20	**6**	0	0	0	0	274	49	53
16:00	3	10	**8**	10	15	49	**123**	80	10	1	0	0	0	0	309	47	49
17:00	4	10	3	2	12	43	105	63	20	2	0	0	0	0	264	48	52
18:00	3	12	4	1	15	40	87	49	13	2	0	0	0	0	226	48	51
19:00	1	9	5	2	6	45	56	24	11	1	0	0	0	0	160	47	51
20:00	1	8	5	1	8	34	51	28	9	1	0	0	0	0	146	47	51
21:00	0	1	3	0	2	28	45	21	5	1	0	0	0	0	106	47	50
22:00	1	5	3	5	7	14	21	13	5	1	0	0	0	0	75	47	52
23:00	1	4	0	0	0	12	20	10	3	2	0	0	0	0	52	48	54
Total	78	168	75	49	171	630	1256	920	244	42	4	0	0	0	3637		
Percent	2.1%	4.6%	2.1%	1.3%	4.7%	17.3%	34.5%	25.3%	6.7%	1.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	11:00	10:00	10:00	11:00	11:00	10:00	10:00	10:00	06:00				11:00		
Vol.	9	11	7	3	16	53	120	81	28	5	1				312		
PM Peak	12:00	14:00	16:00	12:00	12:00	12:00	16:00	14:00	13:00	15:00	13:00				12:00		
Vol.	12	20	8	12	31	91	123	91	27	6	1				366		

Tri-State Traffic Data, Inc.

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610-466-1469

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Weather: Varied
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/28/18	0	2	2	1	0	4	17	8	0	1	0	0	0	0	35	47	49
01:00	1	1	1	0	1	2	4	5	1	0	0	0	0	0	16	48	50
02:00	0	0	0	0	0	2	3	3	1	1	0	0	0	0	10	52	57
03:00	0	1	0	0	0	0	3	4	2	1	**1**	0	0	0	12	55	61
04:00	0	3	0	0	0	0	1	0	1	1	0	0	0	0	6	55	58
05:00	0	2	1	0	0	1	3	2	2	0	1	0	0	0	12	52	61
06:00	0	3	0	0	0	1	1	6	4	0	0	0	0	0	15	52	54
07:00	1	3	1	0	0	6	15	10	2	0	0	0	0	0	38	48	50
08:00	3	10	1	0	1	5	16	15	12	2	0	0	0	0	65	51	54
09:00	1	6	4	1	1	**18**	30	27	21	2	0	0	0	0	111	51	54
10:00	0	**13**	3	1	**3**	15	48	**47**	19	5	1	0	0	0	155	50	54
11:00	**7**	6	**7**	**2**	1	12	**52**	46	**27**	**8**	1	0	0	0	**169**	51	55
12 PM	5	9	9	5	6	23	83	81	31	3	0	0	0	0	255	49	53
13:00	4	10	4	2	6	26	**86**	**97**	**44**	4	**2**	0	0	0	**285**	50	54
14:00	5	**14**	5	**6**	**7**	23	54	86	29	6	1	0	0	0	236	50	54
15:00	2	9	**10**	0	2	**43**	73	76	22	**8**	0	0	0	0	245	49	54
16:00	3	7	4	3	3	28	77	78	25	5	1	0	0	0	234	49	53
17:00	**6**	10	3	1	7	26	82	75	20	3	0	0	0	0	233	49	52
18:00	1	11	3	3	5	25	51	31	16	4	1	**1**	0	0	152	49	54
19:00	2	3	3	2	2	21	65	33	9	4	0	0	0	0	144	48	53
20:00	0	5	2	0	0	19	29	22	11	0	0	0	0	0	88	49	52
21:00	2	2	2	0	6	21	24	25	5	1	0	0	0	0	88	48	51
22:00	2	2	3	0	0	6	11	22	2	1	0	0	0	0	49	49	51
23:00	1	2	0	0	0	8	7	9	0	1	1	0	0	0	29	48	57
Total	46	134	68	27	51	335	835	808	306	61	10	1	0	0	2682		
Percent	1.7%	5.0%	2.5%	1.0%	1.9%	12.5%	31.1%	30.1%	11.4%	2.3%	0.4%	0.0%	0.0%	0.0%			
AM Peak	11:00	10:00	11:00	11:00	10:00	09:00	11:00	10:00	11:00	11:00	03:00				11:00		
Vol.	7	13	7	2	3	18	52	47	27	8	1				169		
PM Peak	17:00	14:00	15:00	14:00	14:00	15:00	13:00	13:00	13:00	15:00	13:00	18:00			13:00		
Vol.	6	14	10	6	7	43	86	97	44	8	2	1			285		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/29/18	0	2	0	1	1	1	7	6	1	0	0	0	0	0	19	48	50
01:00	0	2	1	0	0	3	4	3	0	0	0	0	0	0	13	46	48
02:00	0	1	0	0	0	1	2	2	0	0	0	0	0	0	6	47	49
03:00	0	1	0	0	0	0	2	1	1	0	0	0	0	0	5	51	53
04:00	2	3	0	0	0	0	1	3	1	0	0	0	0	0	10	49	52
05:00	2	5	0	0	0	3	9	9	5	2	0	0	0	0	35	51	55
06:00	7	**15**	4	0	6	6	22	23	8	2	0	0	0	0	93	49	53
07:00	18	12	5	**7**	17	82	**115**	57	12	1	0	0	0	0	326	46	49
08:00	16	14	**9**	2	18	51	114	59	10	1	0	0	0	0	294	47	49
09:00	7	11	7	3	6	45	88	55	13	3	0	0	0	0	238	48	51
10:00	5	7	8	6	12	37	84	79	19	0	0	**1**	0	0	258	48	51
11:00	**19**	8	7	6	**26**	**90**	97	**97**	**27**	**4**	**3**	0	0	0	**384**	48	52
12 PM	14	13	8	8	34	68	**129**	67	19	4	0	0	**1**	0	365	47	51
13:00	39	15	14	7	18	61	97	82	**27**	**5**	**1**	0	0	0	366	48	52
14:00	155	**51**	18	14	28	67	85	35	14	2	0	0	0	0	469	43	48
15:00	106	34	37	**50**	**60**	66	83	43	12	1	0	0	0	0	492	43	48
16:00	240	24	11	5	9	44	85	63	7	1	0	0	0	0	489	44	48
17:00	**242**	44	**44**	31	45	42	60	23	4	0	1	0	0	**1**	**537**	40	45
18:00	10	11	9	15	27	**89**	129	**87**	22	5	1	0	0	0	405	48	51
19:00	3	12	3	2	8	43	87	55	18	3	0	0	0	0	234	48	52
20:00	3	5	0	2	0	18	60	60	18	4	0	0	0	0	170	49	53
21:00	3	3	2	0	2	12	28	28	17	1	1	0	0	0	97	51	54
22:00	0	2	1	0	0	7	6	12	10	0	0	0	0	0	38	52	54
23:00	0	4	2	1	0	4	11	13	3	5	0	0	0	0	43	52	57
Total	891	299	190	160	317	840	1405	962	268	44	7	1	1	1	5386		
Percent	16.5%	5.6%	3.5%	3.0%	5.9%	15.6%	26.1%	17.9%	5.0%	0.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	06:00	08:00	07:00	11:00	11:00	07:00	11:00	11:00	11:00	11:00	10:00			11:00		
Vol.	19	15	9	7	26	90	115	97	27	4	3	1			384		
PM Peak	17:00	14:00	17:00	15:00	15:00	18:00	12:00	18:00	13:00	13:00	13:00		12:00	17:00	17:00		
Vol.	242	51	44	50	60	89	129	87	27	5	1		1	1	537		

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Longitude: 0' 0.0000 Undefined
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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/30/18	0	0	0	0	0	3	5	12	0	0	0	0	0	0	20	48	49
01:00	0	0	0	0	2	2	4	1	2	0	0	0	0	0	11	50	53
02:00	0	0	0	0	0	0	1	2	2	0	0	0	0	0	5	53	54
03:00	0	1	0	0	0	2	1	0	1	2	0	0	0	0	7	57	59
04:00	0	3	1	0	0	1	0	2	3	1	0	0	0	0	11	53	57
05:00	1	6	0	0	1	1	11	6	3	1	1	0	0	0	31	50	57
06:00	5	12	5	3	3	13	21	27	13	2	1	0	0	0	105	50	54
07:00	18	11	9	**12**	17	**73**	122	58	14	0	0	0	0	0	334	46	49
08:00	**21**	**13**	**17**	11	16	38	67	80	25	2	1	0	0	0	291	49	52
09:00	13	9	10	3	5	30	68	70	20	**7**	**2**	0	0	0	237	49	54
10:00	14	7	4	4	7	16	84	85	**34**	7	1	0	0	0	263	50	54
11:00	10	5	5	12	**21**	66	**136**	**90**	26	5	1	0	0	0	**377**	48	52
12 PM	20	9	4	13	23	76	122	**95**	**37**	**9**	**1**	0	0	0	409	49	53
13:00	11	5	7	7	34	54	94	89	30	4	0	0	0	0	335	49	52
14:00	103	28	13	11	26	68	108	66	16	3	1	0	0	0	443	46	49
15:00	53	30	**48**	**56**	**58**	**93**	81	54	6	3	0	0	0	0	482	44	48
16:00	279	**45**	42	36	32	55	46	12	3	4	0	0	0	0	554	38	44
17:00	**402**	30	21	11	8	29	25	21	7	2	0	0	0	0	**556**	35	45
18:00	8	12	9	5	16	89	**144**	59	24	5	0	0	0	0	371	47	52
19:00	5	8	5	7	6	45	100	77	18	6	1	0	0	0	278	48	53
20:00	1	6	7	3	3	31	51	46	12	7	1	0	0	0	168	49	54
21:00	0	2	1	0	0	17	28	36	14	2	1	0	0	0	101	50	54
22:00	0	4	2	0	0	5	11	16	8	0	0	0	0	0	46	50	53
23:00	0	3	2	0	0	3	10	13	7	1	0	0	0	0	39	51	54
Total	964	249	212	194	278	810	1340	1017	325	73	12	0	0	0	5474		
Percent	17.6%	4.5%	3.9%	3.5%	5.1%	14.8%	24.5%	18.6%	5.9%	1.3%	0.2%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	11:00	07:00	11:00	11:00	10:00	09:00	09:00				11:00		
Vol.	21	13	17	12	21	73	136	90	34	7	2				377		
PM Peak	17:00	16:00	15:00	15:00	15:00	15:00	18:00	12:00	12:00	12:00	12:00				17:00		
Vol.	402	45	48	56	58	93	144	95	37	9	1				556		

Tri-State Traffic Data, Inc.

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Longitude: 0' 0.0000 Undefined
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EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/31/18	0	0	2	0	0	2	7	10	3	3	1	0	0	0	28	54	59
01:00	0	0	0	0	1	2	6	3	2	0	0	0	0	0	14	49	53
02:00	0	1	0	0	0	1	2	1	1	1	0	0	0	0	7	54	58
03:00	0	0	0	0	0	1	1	2	1	1	0	0	0	0	6	55	58
04:00	0	4	1	0	0	1	1	4	1	0	0	0	0	0	12	49	51
05:00	2	5	0	0	1	3	7	7	7	1	0	0	0	0	33	52	54
06:00	2	11	5	1	2	11	18	28	11	5	2	0	0	0	96	51	57
07:00	15	10	9	4	15	**53**	100	81	18	3	0	0	0	0	308	48	51
08:00	17	**13**	11	**9**	13	50	76	69	27	7	0	**1**	0	0	293	49	53
09:00	9	6	9	3	3	46	100	90	28	5	1	0	0	0	300	49	53
10:00	**21**	7	9	0	1	23	94	90	26	**13**	**3**	1	0	0	288	49	56
11:00	11	5	**13**	7	**21**	47	**120**	**100**	**37**	11	0	0	0	0	**372**	49	53
12 PM	11	3	8	19	25	49	**133**	**102**	**36**	4	0	0	0	0	390	49	52
13:00	38	18	21	**20**	**31**	51	111	97	21	**6**	1	0	0	0	415	48	51
14:00	75	20	**28**	10	31	**79**	116	91	24	2	0	0	**1**	0	477	47	50
15:00	247	20	18	19	18	34	73	53	9	0	**2**	0	0	0	493	44	48
16:00	**508**	**64**	8	2	0	0	0	0	0	0	0	0	0	0	**582**	14	18
17:00	286	16	23	13	20	40	52	28	3	0	0	0	0	0	481	41	46
18:00	2	12	8	5	23	41	84	55	15	2	0	0	0	0	247	48	51
19:00	3	13	14	7	9	42	61	47	14	2	0	0	0	0	212	48	51
20:00	3	14	7	6	3	32	80	53	13	3	0	0	0	0	214	48	52
21:00	0	7	0	0	0	15	22	32	17	2	0	0	0	0	95	51	54
22:00	0	2	1	1	0	4	18	14	4	2	0	0	0	0	46	49	54
23:00	0	3	1	0	1	1	9	12	6	1	1	0	0	0	35	52	56
Total	1250	254	196	126	218	628	1291	1069	324	74	11	2	1	0	5444		
Percent	23.0%	4.7%	3.6%	2.3%	4.0%	11.5%	23.7%	19.6%	6.0%	1.4%	0.2%	0.0%	0.0%	0.0%			
AM Peak	10:00	08:00	11:00	08:00	11:00	07:00	11:00	11:00	11:00	10:00	10:00	08:00			11:00		
Vol.	21	13	13	9	21	53	120	100	37	13	3	1			372		
PM Peak	16:00	16:00	14:00	13:00	13:00	14:00	12:00	12:00	12:00	13:00	15:00		14:00		16:00		
Vol.	508	64	28	20	31	79	133	102	36	6	2		1		582		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
11/01/18	0	2	1	0	0	2	7	9	4	1	**4**	0	0	0	30	57	63
01:00	0	4	1	0	0	1	6	0	0	0	1	0	0	0	13	44	61
02:00	1	0	0	0	1	1	1	2	4	0	1	0	0	0	11	54	62
03:00	0	1	0	0	0	0	2	2	1	3	0	**1**	0	0	10	59	67
04:00	0	1	0	0	0	1	3	4	4	0	2	0	0	0	15	54	63
05:00	2	6	1	0	1	3	8	8	6	2	1	0	0	0	38	52	57
06:00	6	11	9	2	3	7	18	17	10	1	1	0	0	0	85	49	53
07:00	**23**	14	9	4	**21**	**92**	90	56	24	2	0	0	0	0	335	47	51
08:00	17	**24**	**11**	**12**	6	36	66	66	22	3	2	0	0	0	265	49	53
09:00	9	9	9	0	1	34	86	78	30	7	3	0	0	0	266	50	54
10:00	7	7	6	0	5	24	86	104	27	8	0	0	0	0	274	49	53
11:00	20	4	3	11	19	63	**101**	**118**	**50**	**10**	0	0	0	0	**399**	50	54
12 PM	56	11	14	15	36	64	107	67	25	1	1	0	**1**	0	398	47	51
13:00	10	6	4	3	4	28	89	**121**	**55**	**14**	**2**	0	1	0	337	51	55
14:00	208	**35**	21	15	17	64	55	52	27	6	2	0	0	0	502	46	51
15:00	175	26	27	22	31	46	72	64	18	7	1	0	0	0	489	46	50
16:00	**237**	23	**44**	**43**	**40**	45	54	42	9	0	0	0	0	0	**537**	42	47
17:00	193	28	16	13	27	61	85	52	15	2	0	0	0	0	492	44	49
18:00	6	8	7	10	15	**66**	**128**	61	16	1	2	0	0	0	320	47	50
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	970	220	183	150	227	638	1064	923	347	68	23	1	2	0	4816		
Percent	20.1%	4.6%	3.8%	3.1%	4.7%	13.2%	22.1%	19.2%	7.2%	1.4%	0.5%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	07:00	07:00	11:00	11:00	11:00	11:00	00:00	03:00			11:00		
Vol.	23	24	11	12	21	92	101	118	50	10	4	1			399		
PM Peak	16:00	14:00	16:00	16:00	16:00	18:00	18:00	13:00	13:00	13:00	13:00		12:00		16:00		
Vol.	237	35	44	43	40	66	128	121	55	14	2		1		537		
Total	7964	2867	2077	1721	3083	8957	16569	12416	3812	736	130	17	8	2	60359		
Percent	13.2%	4.7%	3.4%	2.9%	5.1%	14.8%	27.5%	20.6%	6.3%	1.2%	0.2%	0.0%	0.0%	0.0%			

	15th Percentile :	16 MPH
	50th Percentile :	41 MPH
	85th Percentile :	48 MPH
	95th Percentile :	52 MPH
Stats	10 MPH Pace Speed :	41-50 MPH
	Number in Pace :	28985
	Percent in Pace :	48.0%
	Number of Vehicles > 55 MPH :	893
	Percent of Vehicles > 55 MPH :	1.5%
	Mean Speed(Average) :	37 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/19/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	4	**14**	0	0	**7**	**25**	**30**	**9**	**1**	0	0	0	0	0	**90**	44	48
22:00	3	8	**1**	0	3	20	18	6	0	**1**	0	0	0	0	60	44	48
23:00	**5**	5	1	**2**	1	7	12	2	1	0	0	0	0	0	36	44	48
Total	12	27	2	2	11	52	60	17	2	1	0	0	0	0	186		
Percent	6.5%	14.5%	1.1%	1.1%	5.9%	28.0%	32.3%	9.1%	1.1%	0.5%	0.0%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	23:00	21:00	22:00	23:00	21:00	21:00	21:00	21:00	21:00	22:00					21:00		
Vol.	5	14	1	2	7	25	30	9	1	1					90		

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
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Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/20/18	2	5	1	0	1	8	3	3	2	0	0	0	0	0	25	47	51
01:00	2	0	0	1	2	4	5	2	1	0	**1**	0	0	0	18	48	60
02:00	0	0	0	0	0	1	3	0	0	0	0	0	0	0	4	44	44
03:00	0	1	1	0	0	3	2	2	0	0	0	0	0	0	9	46	48
04:00	0	2	0	0	1	3	7	1	4	1	0	0	0	0	19	52	55
05:00	0	1	0	0	3	12	19	12	4	0	1	0	0	0	52	48	53
06:00	0	0	0	1	3	16	27	17	3	0	0	0	0	0	67	47	49
07:00	1	4	0	0	6	31	42	20	5	0	0	0	0	0	109	47	49
08:00	3	8	1	2	11	42	84	36	4	**2**	0	**1**	0	0	194	46	49
09:00	5	10	**6**	0	**15**	63	102	36	**11**	0	1	0	0	0	249	46	49
10:00	7	**14**	4	**4**	4	87	**132**	39	5	2	0	0	0	0	298	45	48
11:00	**12**	9	2	1	5	**99**	115	**46**	11	0	0	0	0	0	**300**	46	49
12 PM	9	12	8	3	13	57	**104**	41	6	0	0	0	0	0	253	46	49
13:00	4	12	10	3	9	55	97	**64**	**15**	0	0	0	0	0	**269**	48	50
14:00	7	14	6	3	6	42	92	58	7	0	**1**	0	0	0	236	47	49
15:00	**10**	12	9	1	6	48	78	47	11	**1**	1	0	0	0	224	47	50
16:00	3	13	**14**	5	8	52	96	44	7	1	0	0	0	0	243	46	49
17:00	6	9	13	3	8	39	74	35	6	0	0	0	0	0	193	46	49
18:00	10	14	2	**6**	**17**	**61**	56	13	3	0	0	0	0	0	182	43	47
19:00	4	**20**	4	3	17	47	32	12	2	0	0	0	0	0	141	43	47
20:00	2	10	2	1	8	40	29	12	2	1	0	0	0	0	107	44	49
21:00	3	9	1	1	6	19	18	6	0	0	0	0	0	0	63	44	47
22:00	2	7	1	1	5	12	25	4	1	0	0	0	0	0	58	44	47
23:00	2	8	0	0	3	3	15	0	2	1	0	0	0	0	34	44	53
Total	94	194	85	39	157	844	1257	550	112	9	5	1	0	0	3347		
Percent	2.8%	5.8%	2.5%	1.2%	4.7%	25.2%	37.6%	16.4%	3.3%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	10:00	09:00	10:00	09:00	11:00	10:00	11:00	09:00	08:00	01:00	08:00			11:00		
Vol.	12	14	6	4	15	99	132	46	11	2	1	1			300		
PM Peak	15:00	19:00	16:00	18:00	18:00	18:00	12:00	13:00	13:00	15:00	14:00				13:00		
Vol.	10	20	14	6	17	61	104	64	15	1	1				269		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/21/18	0	0	0	0	3	4	3	3	3	0	0	0	0	0	16	50	53
01:00	0	4	1	0	0	2	4	1	0	0	0	0	0	0	12	43	46
02:00	2	1	0	0	0	0	3	1	0	0	0	0	0	0	7	44	48
03:00	1	2	0	0	1	5	6	1	1	0	0	0	0	0	17	44	50
04:00	0	2	0	0	1	3	0	1	0	0	0	0	0	0	7	39	48
05:00	0	0	0	0	0	8	9	3	1	0	0	0	0	0	21	46	49
06:00	0	1	1	0	3	7	10	7	5	**1**	0	0	0	0	35	50	54
07:00	0	2	2	1	2	10	20	8	4	0	0	0	0	0	49	47	51
08:00	1	9	3	0	3	9	37	24	4	0	0	0	0	0	90	48	49
09:00	4	5	4	**4**	**6**	30	64	45	**9**	1	0	0	0	0	172	48	50
10:00	2	5	**6**	0	5	30	70	47	8	0	0	0	0	0	173	48	49
11:00	**7**	**16**	4	3	5	**44**	**72**	**52**	6	0	**1**	0	0	0	**210**	47	49
12 PM	6	9	4	1	**9**	**81**	**135**	**60**	8	1	0	0	0	0	**314**	46	49
13:00	7	12	6	0	3	51	87	55	6	**2**	0	0	0	0	229	47	49
14:00	4	18	7	3	9	47	82	38	**9**	0	**2**	0	0	0	219	47	50
15:00	**10**	17	3	0	4	45	87	43	8	2	0	0	0	0	219	47	49
16:00	3	18	**14**	3	2	35	77	52	8	1	0	0	0	0	213	47	49
17:00	6	10	10	1	7	47	61	41	7	0	1	0	0	0	191	47	49
18:00	6	**20**	5	**4**	9	38	52	28	1	2	1	0	0	0	166	46	49
19:00	6	14	0	4	7	45	55	23	3	0	0	0	0	0	157	45	48
20:00	2	10	4	0	9	13	24	4	3	0	0	0	0	0	69	44	49
21:00	2	5	0	0	1	8	18	7	1	0	0	0	0	0	42	46	49
22:00	1	7	0	0	2	3	12	6	0	0	1	0	0	0	32	46	49
23:00	0	3	2	0	1	1	6	1	0	0	0	0	0	0	14	44	46
Total	70	190	76	24	92	566	994	551	95	10	6	0	0	0	2674		
Percent	2.6%	7.1%	2.8%	0.9%	3.4%	21.2%	37.2%	20.6%	3.6%	0.4%	0.2%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	09:00	09:00	11:00	11:00	11:00	09:00	06:00	11:00				11:00		
Vol.	7	16	6	4	6	44	72	52	9	1	1				210		
PM Peak	15:00	18:00	16:00	18:00	12:00	12:00	12:00	12:00	14:00	13:00	14:00				12:00		
Vol.	10	20	14	4	9	81	135	60	9	2	2				314		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
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Weather: Varied
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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/22/18	0	0	0	0	1	3	3	0	1	0	0	0	0	0	8	44	52
01:00	1	1	0	1	0	1	3	1	0	**2**	0	0	0	0	10	56	58
02:00	0	2	1	0	0	2	4	0	0	0	0	0	0	0	9	43	44
03:00	0	0	0	0	0	2	1	1	1	0	0	0	0	0	5	51	53
04:00	0	1	0	0	0	11	14	9	4	0	0	0	0	0	39	48	52
05:00	1	2	1	0	3	9	48	24	8	1	0	0	0	0	97	48	52
06:00	1	3	1	5	29	63	114	55	9	1	0	0	0	0	281	47	49
07:00	22	**11**	5	2	**31**	**205**	**224**	64	13	2	**1**	0	0	0	**580**	44	48
08:00	**25**	11	7	**8**	15	141	194	68	**22**	0	0	0	0	0	491	46	49
09:00	12	4	1	1	7	58	151	**76**	16	1	0	0	0	0	327	47	50
10:00	7	6	7	2	3	54	106	64	13	1	0	0	0	0	263	48	50
11:00	9	10	**12**	5	16	103	128	58	9	1	0	**1**	0	0	352	46	49
12 PM	13	10	10	4	14	83	**165**	**57**	6	1	0	0	0	0	363	45	49
13:00	12	9	6	3	12	102	144	47	7	**2**	0	0	0	0	344	45	49
14:00	27	15	9	2	17	86	147	48	5	1	0	0	0	0	357	45	48
15:00	27	20	**35**	**13**	19	85	151	47	6	0	0	0	0	0	403	44	48
16:00	42	**23**	10	11	23	103	123	51	5	2	0	0	0	0	393	44	48
17:00	**69**	20	20	9	**33**	**112**	108	44	7	0	0	0	0	0	**422**	44	48
18:00	17	17	12	6	10	61	100	38	5	2	0	0	0	0	268	45	49
19:00	5	15	6	3	10	47	57	21	6	0	0	0	0	0	170	45	49
20:00	4	14	1	1	2	23	41	21	**9**	0	0	0	0	0	116	48	51
21:00	5	9	1	0	1	13	11	14	0	1	0	0	0	0	55	47	49
22:00	1	6	1	1	2	6	10	4	1	0	0	0	0	0	32	45	49
23:00	0	2	1	0	0	7	9	2	3	0	0	0	0	0	24	48	53
Total	300	211	147	77	248	1380	2056	814	156	18	1	1	0	0	5409		
Percent	5.5%	3.9%	2.7%	1.4%	4.6%	25.5%	38.0%	15.0%	2.9%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	11:00	08:00	07:00	07:00	07:00	09:00	08:00	01:00	07:00	11:00			07:00		
Vol.	25	11	12	8	31	205	224	76	22	2	1	1			580		
PM Peak	17:00	16:00	15:00	15:00	17:00	17:00	12:00	12:00	20:00	13:00					17:00		
Vol.	69	23	35	13	33	112	165	57	9	2					422		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/23/18	0	2	0	0	0	5	5	0	1	0	0	0	0	0	13	44	51
01:00	0	1	0	0	0	1	2	3	0	0	0	0	0	0	7	48	49
02:00	0	1	0	0	0	0	2	0	0	0	0	0	0	0	3	43	44
03:00	0	0	0	0	0	2	5	5	0	0	0	0	0	0	12	48	49
04:00	1	0	0	0	0	3	11	7	1	2	1	0	0	0	26	50	59
05:00	2	1	0	0	0	13	37	33	**18**	2	**3**	0	0	0	109	51	54
06:00	5	4	3	1	5	69	126	58	9	**4**	1	0	0	0	285	47	49
07:00	**22**	**11**	5	1	13	**170**	**233**	**101**	14	2	0	0	0	0	**572**	46	49
08:00	18	8	**8**	**5**	**17**	100	180	71	15	1	0	**1**	0	0	424	46	49
09:00	5	6	3	1	5	52	94	80	15	2	0	1	0	0	264	48	51
10:00	14	6	6	3	8	70	128	56	14	2	0	0	0	0	307	47	50
11:00	6	10	8	3	8	80	154	52	9	3	0	0	0	0	333	46	49
12 PM	23	6	11	4	16	73	**169**	**86**	**9**	**3**	0	0	0	0	**400**	47	49
13:00	10	7	8	6	22	86	139	62	9	1	0	0	0	0	350	46	49
14:00	39	18	**26**	7	**34**	64	106	50	8	1	0	0	0	0	353	45	49
15:00	31	13	18	2	9	92	121	53	8	1	0	0	0	0	348	45	49
16:00	48	**25**	19	**23**	17	**99**	116	38	5	0	0	0	**1**	0	391	44	48
17:00	**81**	16	16	5	23	84	94	34	7	0	0	0	0	0	360	44	48
18:00	17	18	8	2	11	78	126	49	5	1	0	0	0	0	315	45	49
19:00	10	24	6	4	14	41	73	20	2	0	0	0	0	0	194	44	48
20:00	4	14	1	3	1	25	34	20	4	0	0	0	0	0	106	47	49
21:00	0	6	4	0	1	11	35	20	3	0	0	0	0	0	80	47	49
22:00	28	4	0	0	0	6	11	2	0	0	0	0	0	0	51	42	44
23:00	1	2	0	0	1	3	4	3	4	1	0	**1**	0	0	20	53	65
Total	365	203	150	70	205	1227	2005	903	160	26	5	3	1	0	5323		
Percent	6.9%	3.8%	2.8%	1.3%	3.9%	23.1%	37.7%	17.0%	3.0%	0.5%	0.1%	0.1%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	08:00	08:00	07:00	07:00	07:00	05:00	06:00	05:00	08:00			07:00		
Vol.	22	11	8	5	17	170	233	101	18	4	3	1			572		
PM Peak	17:00	16:00	14:00	16:00	14:00	16:00	12:00	12:00	12:00	12:00		23:00	16:00		12:00		
Vol.	81	25	26	23	34	99	169	86	9	3		1	1		400		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/24/18	0	1	0	0	0	0	7	1	0	0	0	0	0	0	9	44	47
01:00	0	1	0	0	1	0	2	0	0	0	**1**	0	0	0	5	61	63
02:00	0	1	0	1	0	2	7	1	1	0	0	0	0	0	13	45	51
03:00	0	1	0	0	1	1	6	2	1	0	0	0	0	0	12	47	51
04:00	0	1	0	0	1	2	13	9	3	1	1	0	0	0	31	50	57
05:00	0	3	1	0	0	8	28	35	19	4	1	**1**	0	0	100	52	56
06:00	2	4	1	**5**	5	45	118	85	20	3	1	0	**1**	0	290	48	52
07:00	12	6	2	5	**26**	**168**	**213**	**126**	29	5	0	0	0	0	**592**	47	50
08:00	14	**8**	**4**	5	8	50	160	118	**35**	**10**	0	0	1	0	413	49	53
09:00	7	5	4	3	3	33	115	107	34	3	0	0	1	0	315	49	53
10:00	11	8	4	1	4	48	146	94	24	3	0	0	0	0	343	48	52
11:00	**16**	5	3	1	4	89	152	93	24	2	0	0	0	0	389	48	51
12 PM	8	6	5	8	7	**68**	151	77	21	1	0	0	0	0	352	48	51
13:00	14	16	13	12	9	61	122	88	**30**	3	0	0	0	0	368	48	52
14:00	26	11	14	5	**24**	55	111	83	29	**4**	0	0	0	0	362	48	52
15:00	30	20	**15**	**17**	16	47	**154**	84	27	4	**1**	**1**	0	0	**416**	48	52
16:00	43	23	13	5	12	56	139	**90**	14	4	0	0	0	0	399	47	49
17:00	**88**	19	15	10	20	59	85	54	10	1	1	0	0	0	362	46	49
18:00	14	11	6	3	2	30	133	61	21	2	0	0	0	0	283	48	52
19:00	8	**26**	15	2	13	20	54	56	11	3	1	0	0	0	209	48	52
20:00	8	13	6	1	6	26	58	55	6	0	0	0	0	0	179	48	49
21:00	4	10	4	0	4	9	14	20	7	0	1	1	0	0	74	49	53
22:00	0	9	2	1	1	4	13	6	1	1	0	0	0	0	38	46	50
23:00	1	6	2	0	0	3	5	4	7	1	0	0	0	0	29	52	54
Total	306	214	129	85	167	884	2006	1349	374	55	8	3	3	0	5583		
Percent	5.5%	3.8%	2.3%	1.5%	3.0%	15.8%	35.9%	24.2%	6.7%	1.0%	0.1%	0.1%	0.1%	0.0%			
AM Peak	11:00	08:00	08:00	06:00	07:00	07:00	07:00	07:00	08:00	08:00	01:00	05:00	06:00		07:00		
Vol.	16	8	4	5	26	168	213	126	35	10	1	1	1		592		
PM Peak	17:00	19:00	15:00	15:00	14:00	12:00	15:00	16:00	13:00	14:00	15:00	15:00			15:00		
Vol.	88	26	15	17	24	68	154	90	30	4	1	1			416		

Tri-State Traffic Data, Inc.

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610-466-1469

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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/25/18	1	3	0	0	0	2	2	3	2	0	0	0	0	0	13	50	53
01:00	0	1	1	1	0	0	1	3	1	0	0	0	0	0	8	49	52
02:00	0	2	0	0	0	0	1	2	0	0	0	0	0	0	5	48	49
03:00	0	0	1	0	0	3	3	3	1	1	1	0	0	0	13	55	61
04:00	0	1	1	0	0	4	4	8	6	1	0	**1**	0	0	26	53	58
05:00	2	2	1	0	0	6	21	44	19	7	1	0	0	0	103	53	57
06:00	3	5	2	2	6	25	88	100	28	**8**	1	0	0	0	268	49	54
07:00	24	8	5	4	**14**	**105**	**222**	**153**	31	5	0	0	0	0	**571**	48	51
08:00	17	8	6	3	5	55	186	124	29	7	1	1	0	0	442	48	52
09:00	7	6	3	0	2	38	130	106	33	4	0	0	0	0	329	49	53
10:00	14	5	2	0	4	39	132	91	**36**	3	**3**	0	0	0	329	49	53
11:00	**30**	**14**	**13**	**14**	13	50	122	87	17	4	0	0	0	0	364	48	50
12 PM	**62**	9	10	5	**29**	**84**	125	36	11	1	0	0	0	0	372	44	49
13:00	48	**33**	**13**	4	18	81	**144**	75	17	0	0	0	0	0	**433**	46	49
14:00	22	23	2	**7**	11	61	126	**106**	24	5	1	0	0	0	388	48	52
15:00	48	18	13	7	16	77	135	56	20	3	0	0	0	0	393	46	50
16:00	28	17	10	4	9	38	108	75	**35**	**8**	1	**1**	0	0	334	49	54
17:00	21	11	8	1	1	24	86	89	29	7	0	0	0	0	277	49	53
18:00	9	11	1	0	7	23	77	65	15	4	**2**	0	0	0	214	49	53
19:00	11	16	6	2	3	23	39	17	2	2	0	0	0	0	121	45	49
20:00	1	11	5	0	1	6	19	15	7	1	0	0	0	0	66	49	53
21:00	5	6	4	0	0	6	12	11	6	1	0	0	0	0	51	49	53
22:00	3	6	1	0	1	8	17	25	5	1	0	0	0	0	67	49	52
23:00	1	8	2	1	0	5	12	9	10	2	2	0	0	0	52	53	58
Total	357	224	110	55	140	763	1812	1303	384	75	13	3	0	0	5239		
Percent	6.8%	4.3%	2.1%	1.0%	2.7%	14.6%	34.6%	24.9%	7.3%	1.4%	0.2%	0.1%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00	10:00	06:00	10:00	04:00			07:00		
Vol.	30	14	13	14	14	105	222	153	36	8	3	1			571		
PM Peak	12:00	13:00	13:00	14:00	12:00	12:00	13:00	14:00	16:00	16:00	18:00	16:00			13:00		
Vol.	62	33	13	7	29	84	144	106	35	8	2	1			433		

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WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/26/18	0	2	2	0	0	0	7	6	1	1	0	0	0	0	19	49	55
01:00	0	2	1	0	0	2	6	2	2	0	0	0	0	0	15	49	53
02:00	3	1	0	0	1	0	1	1	1	0	0	0	0	0	8	49	52
03:00	0	0	0	0	0	3	3	5	0	1	0	0	0	0	12	49	56
04:00	0	1	1	0	0	1	8	7	4	0	0	**2**	0	0	24	52	66
05:00	0	3	0	0	0	5	20	25	18	5	1	1	0	0	78	53	58
06:00	1	1	0	0	1	15	74	74	30	10	1	0	0	0	207	51	55
07:00	15	5	2	2	6	41	**157**	**129**	38	9	0	0	0	0	**404**	49	53
08:00	8	**13**	4	**5**	5	49	141	114	**45**	8	0	0	0	0	392	49	53
09:00	4	6	**5**	2	8	28	117	108	31	**11**	0	0	0	0	320	49	54
10:00	12	8	4	2	**9**	47	140	87	26	2	1	0	0	0	338	48	52
11:00	**17**	5	1	0	3	**89**	134	89	15	4	**2**	0	0	0	359	48	51
12 PM	18	4	3	5	14	**77**	**167**	**102**	23	6	0	0	0	0	**419**	48	51
13:00	13	17	9	**8**	10	47	129	101	**29**	**7**	**2**	0	0	0	372	49	53
14:00	16	15	**16**	8	15	74	120	74	27	4	2	0	0	0	371	48	52
15:00	29	16	9	4	**24**	65	146	70	12	0	1	0	0	0	376	46	49
16:00	**63**	19	6	8	19	76	87	40	7	6	0	0	0	0	331	45	49
17:00	18	17	1	4	7	63	112	79	12	1	0	0	0	0	314	47	49
18:00	10	**24**	3	1	20	56	76	42	7	5	0	0	0	0	244	47	49
19:00	10	6	1	2	13	43	53	18	6	2	0	0	0	0	154	45	50
20:00	13	11	3	2	6	27	32	11	4	1	0	0	0	0	110	44	49
21:00	12	9	0	2	1	14	22	19	3	1	1	0	0	0	84	47	51
22:00	2	12	1	0	3	13	34	9	6	2	0	0	0	0	82	47	53
23:00	0	4	0	0	0	6	8	8	4	1	0	0	0	0	31	50	54
Total	264	201	72	55	165	841	1794	1220	351	87	11	3	0	0	5064		
Percent	5.2%	4.0%	1.4%	1.1%	3.3%	16.6%	35.4%	24.1%	6.9%	1.7%	0.2%	0.1%	0.0%	0.0%			
AM Peak	11:00	08:00	09:00	08:00	10:00	11:00	07:00	07:00	08:00	09:00	11:00	04:00			07:00		
Vol.	17	13	5	5	9	89	157	129	45	11	2	2			404		
PM Peak	16:00	18:00	14:00	13:00	15:00	12:00	12:00	12:00	13:00	13:00	13:00				12:00		
Vol.	63	24	16	8	24	77	167	102	29	7	2				419		

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WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/27/18	3	3	0	0	0	5	5	2	0	0	0	0	0	0	18	44	47
01:00	1	4	0	0	0	4	3	1	1	0	0	0	0	0	14	44	51
02:00	0	2	0	0	2	4	1	0	0	0	0	0	0	0	9	39	42
03:00	1	1	0	0	0	5	4	4	0	0	0	0	0	0	15	47	49
04:00	0	0	0	0	0	1	3	1	1	0	0	0	0	0	6	50	53
05:00	0	1	0	2	1	5	12	15	11	2	**2**	0	**1**	0	52	53	61
06:00	0	1	0	0	2	2	21	17	7	0	1	0	0	0	51	50	53
07:00	1	2	0	0	1	15	37	18	11	1	0	0	0	0	86	49	53
08:00	4	5	2	1	2	28	57	54	**20**	2	1	0	0	0	176	49	53
09:00	3	**12**	**5**	**5**	4	38	107	76	20	4	0	0	0	0	274	48	52
10:00	11	6	3	5	**6**	33	129	**97**	18	**5**	1	0	0	0	314	48	52
11:00	**14**	8	2	2	3	**59**	**136**	94	15	4	0	0	0	0	**337**	48	50
12 PM	**21**	9	**15**	5	4	**65**	**129**	72	20	0	0	0	0	0	**340**	47	50
13:00	9	**21**	8	**9**	3	42	119	**76**	**21**	2	0	0	0	0	310	48	51
14:00	15	15	4	1	5	36	109	57	18	**3**	0	0	0	0	263	48	52
15:00	5	21	7	1	7	29	110	60	16	1	0	0	0	0	257	48	51
16:00	5	16	5	1	2	40	84	66	16	1	0	0	0	0	236	48	51
17:00	3	15	2	0	6	36	72	34	8	0	0	0	0	0	176	47	49
18:00	6	5	3	1	5	40	63	31	2	2	0	**1**	0	0	159	46	49
19:00	7	12	1	0	**17**	34	41	20	1	0	0	0	0	0	133	45	48
20:00	8	20	0	3	11	33	26	5	5	0	0	0	0	0	111	43	49
21:00	3	7	0	1	2	15	25	13	4	0	0	0	0	0	70	47	50
22:00	4	10	0	0	5	19	17	9	4	1	0	0	0	0	69	47	51
23:00	1	5	1	1	1	6	11	7	2	1	0	0	0	0	36	48	53
Total	125	201	58	38	89	594	1321	829	221	29	5	1	1	0	3512		
Percent	3.6%	5.7%	1.7%	1.1%	2.5%	16.9%	37.6%	23.6%	6.3%	0.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	09:00	09:00	10:00	11:00	11:00	10:00	08:00	10:00	05:00		05:00		11:00		
Vol.	14	12	5	5	6	59	136	97	20	5	2		1		337		
PM Peak	12:00	13:00	12:00	13:00	19:00	12:00	12:00	13:00	13:00	14:00		18:00			12:00		
Vol.	21	21	15	9	17	65	129	76	21	3		1			340		

Tri-State Traffic Data, Inc.

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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/28/18	3	4	1	0	1	5	5	3	1	0	0	0	0	0	23	45	49
01:00	1	3	1	0	**3**	6	4	2	0	1	0	0	0	0	21	44	49
02:00	1	4	0	0	2	6	8	5	3	0	0	**1**	0	0	30	49	54
03:00	0	0	2	0	0	3	4	1	0	0	0	0	0	0	10	44	47
04:00	0	0	0	0	0	3	3	1	1	0	0	0	0	0	8	49	53
05:00	1	1	0	0	0	3	4	5	3	0	**1**	0	0	0	18	52	60
06:00	0	1	0	0	1	4	13	6	6	0	0	0	0	0	31	51	53
07:00	2	1	0	0	2	10	15	23	5	2	0	0	0	0	60	49	54
08:00	2	10	1	1	1	12	23	35	7	0	1	1	0	0	94	49	53
09:00	2	5	**4**	**3**	2	19	61	50	19	2	0	0	0	0	167	49	53
10:00	**5**	11	4	2	1	15	61	55	**21**	2	0	0	0	0	177	49	53
11:00	5	**15**	1	1	3	**20**	**65**	**67**	10	**4**	1	0	0	0	**192**	48	52
12 PM	7	15	5	0	**9**	**39**	**92**	**83**	20	3	0	0	0	0	**273**	48	52
13:00	8	13	7	2	8	19	76	67	22	**6**	0	0	0	0	228	49	53
14:00	7	12	3	**3**	4	24	67	79	**26**	3	**1**	**1**	0	0	230	49	53
15:00	10	14	5	3	6	37	81	46	16	3	1	0	0	0	222	48	52
16:00	5	10	3	1	8	24	78	74	20	3	1	0	0	0	227	49	53
17:00	**14**	13	**8**	1	3	20	58	50	8	1	0	0	0	0	176	48	50
18:00	5	**19**	1	2	7	16	39	32	10	3	0	0	0	0	134	48	53
19:00	2	8	2	0	5	25	41	25	5	2	0	0	0	0	115	47	51
20:00	5	10	3	1	3	14	22	8	4	0	0	0	0	0	70	45	50
21:00	2	8	3	1	5	13	20	6	2	0	0	0	0	0	60	44	49
22:00	2	4	0	0	2	5	7	11	2	1	0	0	0	0	34	49	53
23:00	1	4	0	0	2	4	6	5	1	0	0	0	0	0	23	47	49
Total	90	185	54	21	78	346	853	739	212	36	6	3	0	0	2623		
Percent	3.4%	7.1%	2.1%	0.8%	3.0%	13.2%	32.5%	28.2%	8.1%	1.4%	0.2%	0.1%	0.0%	0.0%			
AM Peak	10:00	11:00	09:00	09:00	01:00	11:00	11:00	11:00	10:00	11:00	05:00	02:00			11:00		
Vol.	5	15	4	3	3	20	65	67	21	4	1	1			192		
PM Peak	17:00	18:00	17:00	14:00	12:00	12:00	12:00	12:00	14:00	13:00	14:00	14:00			12:00		
Vol.	14	19	8	3	9	39	92	83	26	6	1	1			273		

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/29/18	1	0	0	0	0	6	3	0	0	0	0	0	0	0	10	42	44
01:00	1	1	0	0	0	4	1	2	0	0	0	0	0	0	9	46	48
02:00	0	1	0	0	0	0	2	0	0	0	0	0	0	0	3	43	44
03:00	0	0	0	0	0	2	2	3	1	0	0	0	0	0	8	49	52
04:00	0	0	1	0	1	0	11	5	4	2	0	0	0	0	24	52	56
05:00	2	1	0	0	2	10	37	32	9	**4**	0	0	0	0	97	49	54
06:00	2	7	5	9	30	86	90	40	7	1	0	0	0	0	277	45	49
07:00	20	**14**	6	**14**	**74**	**184**	**179**	45	8	0	0	0	0	0	**544**	44	47
08:00	18	7	**10**	3	15	97	174	**89**	11	3	0	0	0	0	427	47	49
09:00	9	11	5	3	5	64	127	67	11	0	0	0	0	0	302	47	49
10:00	6	7	4	1	22	65	128	42	**19**	1	0	0	0	0	295	47	51
11:00	**21**	14	2	3	10	55	126	67	13	2	0	0	0	0	313	47	49
12 PM	18	7	7	6	27	**126**	**160**	65	11	**5**	0	0	0	0	432	46	49
13:00	27	19	7	6	23	97	128	56	12	1	0	0	0	0	376	46	49
14:00	40	12	1	4	18	64	103	50	**13**	2	0	**1**	0	0	308	46	50
15:00	48	**33**	**16**	**15**	**38**	112	110	50	12	1	0	0	0	0	435	44	49
16:00	57	19	10	8	22	112	130	**66**	11	3	0	0	0	0	**438**	46	49
17:00	**70**	20	8	9	15	75	126	60	13	1	0	0	0	0	397	46	49
18:00	12	20	8	3	5	43	94	48	4	2	**2**	0	0	0	241	47	49
19:00	6	20	3	7	6	38	63	42	6	1	0	0	0	0	192	47	49
20:00	5	7	0	0	2	17	50	30	3	0	0	0	0	0	114	47	49
21:00	10	8	2	1	0	12	19	18	5	0	0	1	0	0	76	48	52
22:00	0	4	0	0	1	5	13	10	3	0	0	0	0	0	36	48	51
23:00	1	5	0	0	1	3	9	2	3	0	0	0	0	0	24	48	53
Total	374	237	95	92	317	1277	1885	889	179	29	2	2	0	0	5378		
Percent	7.0%	4.4%	1.8%	1.7%	5.9%	23.7%	35.1%	16.5%	3.3%	0.5%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	07:00	08:00	07:00	07:00	07:00	07:00	08:00	10:00	05:00					07:00		
Vol.	21	14	10	14	74	184	179	89	19	4					544		
PM Peak	17:00	15:00	15:00	15:00	15:00	12:00	12:00	16:00	14:00	12:00	18:00	14:00			16:00		
Vol.	70	33	16	15	38	126	160	66	13	5	2	1			438		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/30/18	1	3	0	0	0	4	5	1	0	0	0	0	0	0	14	43	46
01:00	0	0	1	0	0	4	3	0	0	0	0	0	0	0	8	43	44
02:00	0	1	0	0	1	1	2	1	0	0	0	0	0	0	6	45	48
03:00	1	0	0	0	2	0	2	2	3	1	0	0	0	0	11	53	57
04:00	0	1	0	0	0	3	7	14	6	1	0	0	0	0	32	51	54
05:00	0	2	2	0	1	12	27	35	21	**6**	1	0	0	0	107	52	56
06:00	4	7	5	**5**	12	76	118	65	8	1	0	0	0	0	301	47	49
07:00	**21**	7	0	0	**26**	**169**	**231**	**104**	15	3	1	0	0	0	**577**	46	49
08:00	17	10	**9**	5	15	68	182	102	20	5	0	0	0	0	433	48	50
09:00	14	4	0	1	3	41	138	84	**26**	5	1	0	0	0	317	49	53
10:00	6	7	2	0	9	64	123	69	18	2	0	0	0	0	300	48	51
11:00	11	**16**	6	2	15	84	145	69	13	1	**2**	0	0	0	364	47	49
12 PM	17	7	7	6	10	84	157	**97**	14	2	0	0	0	0	401	47	49
13:00	12	8	9	10	18	93	153	77	11	1	0	0	0	0	392	46	49
14:00	36	30	10	10	**26**	91	111	70	**19**	4	0	0	0	0	407	47	50
15:00	28	24	**11**	7	23	**100**	**167**	69	8	0	**1**	**2**	0	0	**440**	46	49
16:00	59	**31**	4	10	19	73	129	45	11	1	0	0	0	0	382	44	49
17:00	**80**	26	4	**16**	19	79	86	42	6	**5**	0	0	0	0	363	44	49
18:00	14	28	5	6	8	61	105	50	5	2	0	0	0	0	284	46	49
19:00	13	23	4	3	11	51	70	24	2	1	0	0	0	0	202	44	48
20:00	4	13	3	2	3	24	40	15	3	1	0	0	0	0	108	45	49
21:00	1	5	1	0	1	12	21	15	6	1	0	0	0	0	63	49	53
22:00	2	5	1	0	2	2	14	8	4	2	1	0	0	0	41	51	57
23:00	1	7	1	0	0	4	6	7	1	0	0	0	0	0	27	47	49
Total	342	265	85	83	224	1200	2042	1065	220	45	7	2	0	0	5580		
Percent	6.1%	4.7%	1.5%	1.5%	4.0%	21.5%	36.6%	19.1%	3.9%	0.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	08:00	06:00	07:00	07:00	07:00	07:00	09:00	05:00	11:00				07:00		
Vol.	21	16	9	5	26	169	231	104	26	6	2				577		
PM Peak	17:00	16:00	15:00	17:00	14:00	15:00	15:00	12:00	14:00	17:00	15:00	15:00			15:00		
Vol.	80	31	11	16	26	100	167	97	19	5	1	2			440		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
10/31/18	0	0	0	0	0	4	9	2	0	2	0	0	0	0	17	48	57
01:00	1	0	1	0	1	1	1	2	0	0	0	0	0	0	7	47	49
02:00	0	0	0	0	0	2	3	0	2	0	0	0	0	0	7	52	54
03:00	0	1	0	0	0	0	2	5	3	0	1	0	0	0	12	53	61
04:00	1	0	1	0	1	6	7	3	1	1	1	0	0	0	22	49	59
05:00	1	1	2	1	0	3	31	38	11	4	**2**	0	0	0	94	51	56
06:00	2	2	2	4	10	49	132	62	**24**	1	0	0	0	0	288	48	52
07:00	**13**	5	2	4	22	**140**	**222**	98	23	**5**	2	**1**	0	0	**537**	47	50
08:00	13	12	5	2	16	83	179	**103**	19	5	0	0	0	0	437	47	50
09:00	9	11	**7**	1	9	81	124	60	13	1	1	0	0	0	317	47	49
10:00	10	**14**	7	**5**	**29**	128	128	46	7	2	0	0	0	0	376	44	48
11:00	9	9	0	1	15	121	139	33	11	1	1	0	0	0	340	44	49
12 PM	18	15	8	5	18	103	111	**39**	6	0	0	0	0	0	323	44	48
13:00	35	15	5	12	**42**	**111**	83	35	**8**	0	0	0	0	0	346	44	48
14:00	37	30	12	13	40	111	**130**	39	6	1	0	0	0	0	**419**	44	48
15:00	71	31	**15**	12	38	100	110	31	2	0	0	0	0	0	410	43	47
16:00	**108**	**32**	11	**15**	36	64	41	7	3	0	0	0	0	0	317	40	44
17:00	67	29	7	5	22	58	86	25	5	1	**1**	0	0	0	306	44	48
18:00	16	23	7	2	10	64	61	15	4	**2**	0	0	0	0	204	44	48
19:00	14	24	5	2	24	40	32	23	1	0	0	0	0	0	165	44	48
20:00	8	13	3	3	11	54	57	17	5	0	0	0	0	0	171	44	48
21:00	1	7	0	0	2	16	17	8	3	0	0	0	0	0	54	46	50
22:00	1	3	0	0	1	14	8	8	5	0	0	0	0	0	40	49	53
23:00	2	3	0	0	1	4	5	2	3	0	0	0	0	0	20	50	53
Total	437	280	100	87	348	1357	1718	701	165	26	9	1	0	0	5229		
Percent	8.4%	5.4%	1.9%	1.7%	6.7%	26.0%	32.9%	13.4%	3.2%	0.5%	0.2%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	09:00	10:00	10:00	07:00	07:00	08:00	06:00	07:00	05:00	07:00			07:00		
Vol.	13	14	7	5	29	140	222	103	24	5	2	1			537		
PM Peak	16:00	16:00	15:00	16:00	13:00	13:00	14:00	12:00	13:00	18:00	17:00				14:00		
Vol.	108	32	15	15	42	111	130	39	8	2	1				419		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Dorsey
Weather: Varied
Counter: TSTD

Site Code:
Station ID:

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
11/01/18	1	2	1	0	3	3	6	2	0	0	0	0	0	0	18	44	47
01:00	1	2	0	0	1	0	3	4	0	0	0	0	0	0	11	47	49
02:00	0	2	0	0	0	1	4	1	0	0	0	0	0	0	8	44	47
03:00	1	1	1	0	0	1	3	3	4	0	0	**1**	0	0	15	53	66
04:00	0	0	0	0	0	3	11	3	4	2	0	0	0	0	23	53	57
05:00	0	2	0	0	1	15	34	32	**12**	0	0	0	0	0	96	49	53
06:00	7	6	2	2	14	117	82	36	7	**3**	**1**	0	0	0	277	45	49
07:00	25	10	3	**12**	**67**	**227**	163	**50**	5	0	0	0	0	0	**562**	44	47
08:00	**30**	**20**	**16**	2	40	127	**174**	42	4	0	0	0	0	0	455	44	47
09:00	13	8	4	5	26	98	122	43	8	0	1	0	0	0	328	45	49
10:00	13	6	3	0	21	121	117	30	5	0	0	0	0	0	316	44	48
11:00	21	8	2	5	41	146	107	20	3	0	0	0	0	0	353	43	46
12 PM	33	14	3	12	86	144	71	14	**2**	0	0	0	**2**	0	381	42	44
13:00	25	12	9	6	50	**148**	**95**	**24**	2	**2**	0	0	0	0	373	43	46
14:00	51	18	13	**29**	74	108	49	13	1	1	0	0	0	0	357	41	44
15:00	**66**	**20**	**20**	13	75	148	66	14	0	2	0	0	0	0	**424**	41	44
16:00	54	14	7	19	**91**	124	51	8	1	0	0	0	0	0	369	40	44
17:00	56	16	6	10	75	145	54	6	2	0	0	0	0	0	370	40	44
18:00	22	12	6	1	33	92	68	8	2	1	**1**	0	0	0	246	43	44
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	419	173	96	116	698	1768	1280	353	62	11	3	1	2	0	4982		
Percent	8.4%	3.5%	1.9%	2.3%	14.0%	35.5%	25.7%	7.1%	1.2%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	07:00	07:00	07:00	08:00	07:00	05:00	06:00	06:00	03:00			07:00		
Vol.	30	20	16	12	67	227	174	50	12	3	1	1			562		
PM Peak	15:00	15:00	15:00	14:00	16:00	13:00	13:00	13:00	12:00	13:00	18:00		12:00		15:00		
Vol.	66	20	20	29	91	148	95	24	2	2	1		2		424		
Total	3555	2805	1259	844	2939	13099	21083	11283	2693	457	81	24	7	0	60129		
Percent	5.9%	4.7%	2.1%	1.4%	4.9%	21.8%	35.1%	18.8%	4.5%	0.8%	0.1%	0.0%	0.0%	0.0%			

	15th Percentile :	30 MPH
	50th Percentile :	41 MPH
	85th Percentile :	47 MPH
	95th Percentile :	50 MPH
Stats	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	34182
	Percent in Pace :	56.8%
	Number of Vehicles > 55 MPH :	569
	Percent of Vehicles > 55 MPH :	0.9%
	Mean Speed(Average) :	39 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	4	139	39	**3**	8	0	1	4	0	0	0	0	0	198
15:00	8	**271**	**71**	0	11	**3**	1	8	1	0	0	0	0	**374**
16:00	**10**	267	57	2	6	3	**5**	5	**2**	0	0	0	0	357
17:00	10	250	52	0	**12**	1	4	**11**	1	0	0	0	0	341
18:00	3	154	48	0	5	0	2	2	1	0	**1**	0	0	216
19:00	0	127	31	0	5	0	0	2	1	0	0	0	0	166
20:00	1	102	16	1	3	1	1	1	0	0	0	0	0	126
21:00	0	58	6	0	3	0	0	0	0	0	0	0	0	67
22:00	0	58	6	0	0	0	0	0	0	0	0	0	0	64
23:00	0	39	5	0	0	0	0	0	0	0	0	0	0	44
Day Total	36	1465	331	6	53	8	14	33	6	0	1	0	0	1953
Percent	1.8%	75.0%	16.9%	0.3%	2.7%	0.4%	0.7%	1.7%	0.3%	0.0%	0.1%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak	16:00	15:00	15:00	14:00	17:00	15:00	16:00	17:00	16:00		18:00			15:00
Vol.	10	271	71	3	12	3	5	11	2		1			374

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	17	4	0	0	0	0	0	0	0	0	0	0	21
01:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
04:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
05:00	0	14	15	1	1	0	1	0	0	0	0	0	0	32
06:00	0	20	10	0	0	0	0	0	0	0	0	0	0	30
07:00	1	50	7	0	1	1	**2**	0	0	0	0	0	0	62
08:00	0	97	27	0	**5**	0	1	3	0	0	0	0	0	133
09:00	0	139	35	1	2	**2**	2	**5**	0	0	0	0	0	186
10:00	**9**	**196**	**56**	**2**	4	0	1	4	0	0	0	0	0	**272**
11:00	9	187	48	0	5	1	0	4	**1**	0	**1**	0	0	256
12 PM	5	157	34	0	**4**	**1**	0	**3**	**3**	0	0	0	0	**207**
13:00	3	**161**	**38**	0	1	0	**1**	2	0	0	0	0	0	206
14:00	3	138	25	0	1	1	1	0	1	0	0	0	0	170
15:00	**6**	146	21	0	3	0	1	1	0	0	0	0	0	178
16:00	5	161	37	0	1	0	0	1	0	0	0	0	0	205
17:00	3	126	28	0	3	1	1	3	0	0	0	0	0	165
18:00	2	119	28	0	0	0	0	2	0	0	0	0	0	151
19:00	3	100	26	0	1	1	0	1	0	0	0	0	0	132
20:00	1	64	12	0	1	0	0	0	0	0	0	0	0	78
21:00	0	54	11	0	0	0	0	0	0	0	0	0	0	65
22:00	0	45	10	0	0	0	0	1	0	0	0	0	0	56
23:00	0	27	6	0	1	0	0	0	0	0	0	0	0	34
Day Total	50	2059	482	4	34	8	11	30	5	0	1	0	0	2684
Percent	1.9%	76.7%	18.0%	0.1%	1.3%	0.3%	0.4%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	10:00	10:00	08:00	09:00	07:00	09:00	11:00		11:00			10:00
Vol.	9	196	56	2	5	2	2	5	1		1			272
PM Peak	15:00	13:00	13:00		12:00	12:00	13:00	12:00	12:00					12:00
Vol.	6	161	38		4	1	1	3	3					207

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	12	1	0	0	0	0	0	0	0	0	0	0	13
01:00	0	12	4	0	0	0	0	0	0	0	0	0	0	16
02:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
04:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
05:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
06:00	0	12	6	0	0	0	0	0	0	0	0	0	0	18
07:00	0	36	10	0	**2**	0	0	1	0	0	0	0	0	49
08:00	0	49	10	0	0	**1**	0	0	0	0	0	0	0	60
09:00	0	86	23	0	1	0	0	1	0	0	0	0	0	111
10:00	2	106	21	0	2	0	0	2	0	0	0	0	0	133
11:00	**4**	**131**	**30**	**1**	1	0	**1**	**3**	0	0	0	0	0	**171**
12 PM	**7**	**199**	**40**	**1**	1	**1**	0	3	0	0	0	0	0	**252**
13:00	4	166	36	1	1	0	**1**	0	0	0	0	0	0	209
14:00	4	160	25	0	2	0	0	**4**	0	0	0	0	0	195
15:00	4	148	15	0	0	0	0	1	0	0	0	0	0	168
16:00	7	126	31	0	**3**	0	0	2	0	0	0	0	0	169
17:00	3	118	24	1	1	0	1	1	0	0	0	0	0	149
18:00	4	103	24	1	2	0	0	0	0	0	0	0	0	134
19:00	4	104	16	0	2	0	1	0	0	0	0	0	0	127
20:00	2	73	12	0	3	0	0	0	0	0	0	0	0	90
21:00	0	31	8	0	1	1	1	0	0	0	0	0	0	42
22:00	0	23	4	0	1	0	0	0	0	0	0	0	0	28
23:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
Day Total	45	1742	350	5	23	3	5	18	0	0	0	0	0	2191
Percent	2.1%	79.5%	16.0%	0.2%	1.0%	0.1%	0.2%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	11:00	07:00	08:00	11:00	11:00						11:00
Vol.	4	131	30	1	2	1	1	3						171
PM Peak	12:00	12:00	12:00	12:00	16:00	12:00	13:00	14:00						12:00
Vol.	7	199	40	1	3	1	1	4						252

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
04:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
05:00	0	21	14	1	3	0	0	0	0	0	0	0	0	39
06:00	2	124	55	2	7	2	6	3	1	0	0	0	0	202
07:00	2	**275**	57	**5**	9	0	5	6	0	0	0	0	0	**359**
08:00	**10**	266	53	3	6	2	3	**12**	0	0	0	0	0	355
09:00	2	134	**60**	2	8	**4**	7	2	1	**1**	0	0	0	221
10:00	3	136	44	1	11	3	5	1	0	0	0	0	0	204
11:00	3	169	53	5	**14**	3	**9**	3	**3**	0	0	0	0	262
12 PM	**13**	218	67	3	9	**5**	**8**	11	**3**	0	0	0	0	337
13:00	6	211	64	1	**11**	1	7	4	0	0	0	0	0	305
14:00	5	214	66	4	8	4	3	6	0	**1**	0	0	0	311
15:00	10	240	66	1	10	5	5	7	1	0	0	0	0	345
16:00	4	**263**	**76**	**5**	11	0	3	**13**	2	0	0	0	0	**377**
17:00	6	258	46	0	5	0	2	7	0	0	0	0	0	324
18:00	6	166	36	0	3	1	0	2	0	0	0	0	0	214
19:00	1	128	30	0	3	0	1	0	0	0	0	0	0	163
20:00	1	115	20	1	2	0	0	2	0	0	0	0	0	141
21:00	0	39	6	0	0	0	0	0	0	0	0	0	0	45
22:00	1	25	1	0	0	0	0	0	0	0	0	0	0	27
23:00	0	21	5	0	0	0	0	0	0	0	0	0	0	26
Day Total	75	3054	825	34	120	30	64	79	11	2	0	0	0	4294
Percent	1.7%	71.1%	19.2%	0.8%	2.8%	0.7%	1.5%	1.8%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	09:00	07:00	11:00	09:00	11:00	08:00	11:00	09:00				07:00
Vol.	10	275	60	5	14	4	9	12	3	1				359
PM Peak	12:00	16:00	16:00	16:00	13:00	12:00	12:00	16:00	12:00	14:00				16:00
Vol.	13	263	76	5	11	5	8	13	3	1				377

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	2	0	0	0	0	0	1	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
04:00	0	6	4	0	1	0	0	0	1	0	0	0	0	12
05:00	0	26	15	1	2	0	3	0	1	0	0	0	0	48
06:00	1	131	55	1	4	2	1	1	0	**2**	0	0	0	198
07:00	4	247	**63**	3	8	2	**12**	**11**	1	2	0	0	0	**353**
08:00	6	**252**	53	2	**9**	2	2	4	**2**	1	0	0	0	333
09:00	4	127	40	1	8	1	4	3	2	0	0	0	0	190
10:00	3	165	50	3	5	**4**	7	3	2	2	0	0	0	244
11:00	**8**	172	49	**5**	9	3	4	10	1	1	0	0	0	262
12 PM	10	224	58	0	9	3	**14**	2	1	1	0	0	0	322
13:00	4	192	56	1	12	1	2	7	**2**	**3**	0	0	0	280
14:00	6	175	**73**	**5**	**19**	**5**	0	6	2	1	0	0	0	292
15:00	**12**	242	70	5	6	4	10	**18**	2	0	0	0	0	369
16:00	10	**300**	73	1	4	1	1	17	0	0	0	0	0	**407**
17:00	6	285	63	1	12	0	2	4	2	0	0	0	0	375
18:00	4	203	47	0	4	1	1	7	1	0	0	0	0	268
19:00	4	152	31	0	5	0	2	0	0	0	0	0	0	194
20:00	2	104	24	0	3	0	0	2	0	0	0	0	0	135
21:00	0	46	10	0	1	0	0	0	0	0	0	0	0	57
22:00	0	19	7	0	1	0	0	0	0	0	0	0	0	27
23:00	0	18	4	0	0	0	0	0	0	0	0	0	0	22
Day Total	84	3108	846	29	122	29	65	96	20	13	0	0	0	4412
Percent	1.9%	70.4%	19.2%	0.7%	2.8%	0.7%	1.5%	2.2%	0.5%	0.3%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	07:00	11:00	08:00	10:00	07:00	07:00	08:00	06:00				07:00
Vol.	8	252	63	5	9	4	12	11	2	2				353
PM Peak	15:00	16:00	14:00	14:00	14:00	14:00	12:00	15:00	13:00	13:00				16:00
Vol.	12	300	73	5	19	5	14	18	2	3				407

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	9	1	0	0	0	0	0	0	0	0	0	0	10
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
04:00	0	5	4	0	0	0	0	0	0	0	0	0	0	9
05:00	0	18	15	0	2	3	0	0	0	0	0	0	0	38
06:00	0	125	51	1	4	2	3	0	0	0	0	0	0	186
07:00	**8**	**256**	53	3	**14**	2	7	10	2	**2**	0	0	0	**357**
08:00	7	222	48	2	5	**6**	2	8	4	0	0	0	0	304
09:00	3	138	36	1	8	1	4	3	6	0	0	0	0	200
10:00	0	145	**54**	2	11	0	**8**	3	**8**	0	0	0	0	231
11:00	7	202	44	**5**	9	0	7	**11**	3	1	0	0	0	289
12 PM	9	209	49	0	9	**3**	5	7	3	0	0	0	0	294
13:00	7	172	52	**5**	5	3	4	2	**10**	**2**	0	0	0	262
14:00	5	179	46	2	12	2	4	6	9	2	0	0	0	267
15:00	4	232	57	2	**16**	2	6	**10**	0	0	0	0	0	329
16:00	8	**280**	**66**	3	5	0	**7**	9	2	0	0	0	0	**380**
17:00	**14**	249	42	0	8	1	7	7	0	0	0	0	0	328
18:00	7	220	48	1	5	1	3	5	1	0	0	0	0	291
19:00	8	167	27	0	3	2	0	4	0	0	0	0	0	211
20:00	4	137	34	0	1	0	0	1	0	0	0	0	0	177
21:00	0	58	12	0	1	0	0	0	0	0	0	0	0	71
22:00	0	24	3	0	0	0	0	0	0	0	0	0	0	27
23:00	0	22	5	1	1	0	0	0	0	0	0	0	0	29
Day Total	91	3086	753	28	119	28	67	86	48	7	0	0	0	4313
Percent	2.1%	71.6%	17.5%	0.6%	2.8%	0.6%	1.6%	2.0%	1.1%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	10:00	11:00	07:00	08:00	10:00	11:00	10:00	07:00				07:00
Vol.	8	256	54	5	14	6	8	11	8	2				357
PM Peak	17:00	16:00	16:00	13:00	15:00	12:00	16:00	15:00	13:00	13:00				16:00
Vol.	14	280	66	5	16	3	7	10	10	2				380

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Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	8	2	0	0	0	0	0	0	0	0	0	0	10
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
03:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
05:00	0	18	18	0	1	1	1	0	0	0	0	0	0	39
06:00	0	114	50	2	4	1	3	4	0	0	0	0	0	178
07:00	3	**267**	**55**	**6**	4	0	2	8	0	**1**	0	0	0	**346**
08:00	**5**	238	50	2	**15**	1	0	**9**	1	1	0	0	0	322
09:00	2	179	55	0	5	**3**	**6**	2	3	0	0	0	0	255
10:00	2	170	48	1	8	1	3	3	1	1	0	0	0	238
11:00	2	192	54	4	14	2	4	6	**4**	0	0	0	0	282
12 PM	9	234	**61**	1	7	2	2	3	1	1	0	0	0	321
13:00	4	199	42	**2**	**17**	2	4	9	4	0	0	0	0	283
14:00	8	179	59	2	9	2	5	8	6	1	0	0	0	279
15:00	**11**	241	56	1	16	**3**	6	**18**	**8**	**2**	0	0	0	362
16:00	8	255	58	2	7	3	1	14	1	0	0	0	0	349
17:00	10	**268**	59	0	6	3	**7**	10	3	0	0	0	0	**366**
18:00	6	211	47	1	2	0	1	4	0	0	0	0	0	272
19:00	4	145	30	0	1	0	2	1	0	0	0	0	0	183
20:00	2	87	17	0	1	0	1	1	0	0	0	0	0	109
21:00	0	47	10	0	0	0	0	0	0	0	0	0	0	57
22:00	0	36	3	0	0	0	0	0	0	0	0	0	0	39
23:00	0	17	6	0	0	0	0	0	0	0	0	0	0	23
Day Total	76	3135	784	24	117	24	48	100	32	7	0	0	0	4347
Percent	1.7%	72.1%	18.0%	0.6%	2.7%	0.6%	1.1%	2.3%	0.7%	0.2%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	07:00	08:00	09:00	09:00	08:00	11:00	07:00				07:00
Vol.	5	267	55	6	15	3	6	9	4	1				346
PM Peak	15:00	17:00	12:00	13:00	13:00	15:00	17:00	15:00	15:00	15:00				17:00
Vol.	11	268	61	2	17	3	7	18	8	2				366

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
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Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/05/18	0	6	0	0	0	0	0	0	0	0	0	0	0	6
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
02:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
03:00	0	7	3	0	0	0	0	0	1	0	0	0	0	11
04:00	0	7	5	0	2	0	0	0	0	0	0	0	0	14
05:00	0	26	18	0	2	2	5	2	0	**1**	0	0	0	56
06:00	1	119	42	4	8	1	**6**	0	0	0	0	0	0	181
07:00	3	**245**	50	4	**17**	2	5	11	2	1	0	0	0	**340**
08:00	5	223	46	**8**	7	4	5	5	4	1	0	0	0	308
09:00	**6**	153	43	1	13	3	6	1	**10**	0	0	0	0	236
10:00	5	184	49	1	5	**5**	3	4	6	0	0	0	0	262
11:00	3	210	**55**	1	12	3	0	**12**	1	1	0	0	0	298
12 PM	**12**	210	59	5	**18**	**5**	4	11	3	0	0	0	0	327
13:00	11	231	58	**6**	11	4	3	0	**6**	**1**	0	0	0	331
14:00	7	207	53	2	12	2	**5**	6	6	1	0	0	0	301
15:00	9	239	**82**	1	16	1	2	6	3	0	0	0	0	359
16:00	5	**285**	67	1	14	0	3	**15**	1	0	0	0	0	**391**
17:00	9	157	30	2	3	1	3	5	0	0	0	0	0	210
18:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	76	2516	662	36	140	33	50	78	43	6	0	0	0	3640
Percent	2.1%	69.1%	18.2%	1.0%	3.8%	0.9%	1.4%	2.1%	1.2%	0.2%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	11:00	08:00	07:00	10:00	06:00	11:00	09:00	05:00				07:00
Vol.	6	245	55	8	17	5	6	12	10	1				340
PM Peak	12:00	16:00	15:00	13:00	12:00	12:00	14:00	16:00	13:00	13:00				16:00
Vol.	12	285	82	6	18	5	5	15	6	1				391

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Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak														
Vol.														

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/07/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak														
Vol.														

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/08/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	**2**	0	0	0	0	0	0	0	0	0	0	0	**2**
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Percent	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00												11:00
Vol.		2												2
PM Peak														
Vol.														
Grand Total	533	20167	5033	166	728	163	324	520	165	35	2	0	0	27836
Percent	1.9%	72.4%	18.1%	0.6%	2.6%	0.6%	1.2%	1.9%	0.6%	0.1%	0.0%	0.0%	0.0%	

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Weather: Clear
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	1	206	44	**7**	**16**	1	2	3	**3**	0	0	0	0	283
15:00	**9**	249	**78**	6	14	4	1	10	3	0	0	0	0	374
16:00	3	280	73	4	7	3	**3**	**11**	0	0	**2**	0	0	**386**
17:00	4	**304**	52	0	6	0	1	7	1	0	0	0	0	375
18:00	5	220	27	1	3	0	1	3	0	0	0	0	0	260
19:00	0	138	34	0	5	**5**	2	2	0	0	0	0	0	186
20:00	0	133	34	0	3	1	0	2	0	0	0	0	0	173
21:00	1	93	13	0	1	0	0	0	0	0	0	0	0	108
22:00	0	67	14	0	1	0	0	0	0	0	0	0	0	82
23:00	0	45	6	0	1	0	0	0	0	0	0	0	0	52
Day Total	23	1735	375	18	57	14	10	38	7	0	2	0	0	2279
Percent	1.0%	76.1%	16.5%	0.8%	2.5%	0.6%	0.4%	1.7%	0.3%	0.0%	0.1%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak	15:00	17:00	15:00	14:00	14:00	19:00	16:00	16:00	14:00		16:00			16:00
Vol.	9	304	78	7	16	5	3	11	3		2			386

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EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	26	2	0	0	0	0	0	0	0	0	0	0	28
01:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
02:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	5	7	0	0	0	0	0	0	0	0	0	0	12
05:00	0	10	6	0	0	0	0	0	0	0	0	0	0	16
06:00	0	36	14	0	2	0	0	0	0	0	0	0	0	52
07:00	0	64	23	0	2	1	0	0	0	0	0	0	0	90
08:00	0	79	21	0	6	2	1	1	0	0	0	0	0	110
09:00	**2**	160	**46**	**2**	5	0	0	1	0	0	0	0	0	216
10:00	0	205	36	0	**10**	3	0	**4**	**1**	0	0	0	0	259
11:00	2	**212**	43	1	9	**6**	**2**	3	1	0	0	0	0	**279**
12 PM	**5**	187	**51**	0	**7**	**4**	0	1	0	0	0	0	0	**255**
13:00	2	149	37	**1**	2	3	0	2	0	0	0	0	0	196
14:00	1	180	33	1	6	1	0	1	0	0	0	0	0	223
15:00	2	164	33	0	2	1	**1**	**6**	0	0	0	0	0	209
16:00	2	**189**	36	0	3	4	0	3	**1**	0	0	0	0	238
17:00	4	187	34	0	3	0	0	1	0	0	0	0	0	229
18:00	0	133	32	0	5	3	1	1	1	0	0	0	0	176
19:00	0	110	22	0	1	1	0	1	0	0	0	0	0	135
20:00	0	83	15	0	2	0	0	2	0	0	0	0	0	102
21:00	0	76	13	0	1	0	0	0	0	0	0	0	0	90
22:00	0	43	9	0	1	0	0	0	0	0	0	0	0	53
23:00	0	37	4	0	0	0	0	0	0	0	0	0	0	41
Day Total	20	2366	519	5	67	29	5	27	4	0	0	0	0	3042
Percent	0.7%	77.8%	17.1%	0.2%	2.2%	1.0%	0.2%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	09:00	09:00	10:00	11:00	11:00	10:00	10:00					11:00
Vol.	2	212	46	2	10	6	2	4	1					279
PM Peak	12:00	16:00	12:00	13:00	12:00	12:00	15:00	15:00	16:00					12:00
Vol.	5	189	51	1	7	4	1	6	1					255

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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	23	6	0	3	0	0	1	0	0	0	0	0	33
01:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
02:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
03:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
04:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
05:00	0	10	5	0	1	0	0	0	0	0	0	0	0	16
06:00	0	24	4	0	1	0	0	0	0	0	0	0	0	29
07:00	0	40	10	0	2	0	0	0	0	0	0	0	0	52
08:00	0	72	14	0	0	0	**1**	0	0	0	0	0	0	87
09:00	3	116	17	0	2	**2**	0	**4**	0	0	0	0	0	144
10:00	**4**	**158**	40	**1**	3	0	0	3	**1**	0	0	0	0	**210**
11:00	2	126	**41**	0	**4**	0	0	2	0	0	0	0	0	175
12 PM	4	180	42	0	**5**	0	0	3	**1**	0	0	0	0	235
13:00	**5**	180	33	0	5	1	0	**5**	0	0	0	0	0	229
14:00	2	**203**	**43**	0	4	1	0	0	0	0	0	0	0	**253**
15:00	4	196	36	0	4	2	0	0	0	0	0	0	0	242
16:00	5	183	41	0	2	2	0	1	0	0	0	0	0	234
17:00	4	160	30	0	5	1	0	3	0	0	0	0	0	203
18:00	0	129	25	0	3	**3**	**1**	0	0	0	0	0	0	161
19:00	1	105	18	**1**	5	1	0	0	0	0	0	0	0	131
20:00	0	81	13	0	2	1	0	1	0	0	0	0	0	98
21:00	0	59	11	0	1	0	0	1	0	0	0	0	0	72
22:00	0	29	5	0	1	0	0	0	0	0	0	0	0	35
23:00	0	17	2	0	1	0	0	0	0	0	0	0	0	20
Day Total	34	2127	442	2	55	14	2	24	2	0	0	0	0	2702
Percent	1.3%	78.7%	16.4%	0.1%	2.0%	0.5%	0.1%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	10:00	11:00	09:00	08:00	09:00	10:00					10:00
Vol.	4	158	41	1	4	2	1	4	1					210
PM Peak	13:00	14:00	14:00	19:00	12:00	18:00	18:00	13:00	12:00					14:00
Vol.	5	203	43	1	5	3	1	5	1					253

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Site Code:
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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	0	8	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	4	0	1	1	0	0	0	0	0	0	0	0	6
02:00	0	5	0	0	0	1	0	0	0	0	0	0	0	6
03:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
04:00	0	16	5	0	0	2	0	0	0	0	0	0	0	23
05:00	0	40	12	0	0	0	0	2	0	0	0	0	0	54
06:00	0	86	24	4	4	0	0	1	0	0	0	0	0	119
07:00	4	**271**	**106**	6	17	2	**2**	6	0	0	0	0	0	**414**
08:00	6	227	77	**15**	**18**	3	2	**11**	**2**	0	0	0	0	361
09:00	2	145	54	1	13	**7**	2	0	0	0	0	0	0	224
10:00	1	171	66	1	12	0	1	5	1	0	0	0	0	258
11:00	**7**	227	46	4	15	3	0	7	1	0	0	0	0	310
12 PM	2	242	79	1	17	0	2	7	**2**	0	0	0	0	352
13:00	2	206	57	2	**22**	**3**	1	8	0	0	0	0	0	301
14:00	4	275	**90**	**9**	19	2	2	6	2	0	0	0	0	409
15:00	4	268	86	9	20	0	1	7	1	0	0	0	0	396
16:00	3	281	74	0	14	2	2	10	0	0	0	0	0	386
17:00	**7**	**329**	76	1	7	3	**5**	**11**	1	0	0	0	0	**440**
18:00	4	225	41	0	7	3	4	6	0	0	0	0	0	290
19:00	2	168	38	0	7	1	1	3	0	0	0	0	0	220
20:00	0	114	15	0	3	0	0	0	0	0	0	0	0	132
21:00	0	58	7	0	6	0	0	0	0	0	0	0	0	71
22:00	0	30	6	0	0	0	0	0	0	0	0	0	0	36
23:00	0	16	2	0	0	0	0	0	0	0	0	0	0	18
Day Total	48	3419	961	54	202	32	25	90	10	0	0	0	0	4841
Percent	1.0%	70.6%	19.9%	1.1%	4.2%	0.7%	0.5%	1.9%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	08:00	08:00	09:00	07:00	08:00	08:00					07:00
Vol.	7	271	106	15	18	7	2	11	2					414
PM Peak	17:00	17:00	14:00	14:00	13:00	13:00	17:00	17:00	12:00					17:00
Vol.	7	329	90	9	22	3	5	11	2					440

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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	8	6	0	0	1	0	1	0	0	0	0	0	16
05:00	0	40	13	0	2	1	0	1	1	0	0	0	0	58
06:00	2	89	22	5	9	0	0	1	0	0	0	0	0	128
07:00	2	**292**	**81**	7	22	2	1	**11**	1	**2**	0	0	0	**421**
08:00	3	207	67	**12**	**25**	**5**	3	9	0	0	0	0	0	331
09:00	2	169	60	2	14	4	1	3	0	0	0	0	0	255
10:00	**4**	155	56	2	11	3	3	10	**4**	0	0	0	0	248
11:00	3	192	66	6	20	4	**4**	7	0	0	0	0	0	302
12 PM	2	226	**79**	1	13	**5**	0	9	1	0	0	0	0	336
13:00	1	203	66	3	**24**	1	0	7	**2**	0	0	0	0	307
14:00	6	244	70	**14**	22	2	0	4	2	0	0	0	0	364
15:00	5	218	56	9	15	1	0	**12**	0	**1**	0	0	0	317
16:00	2	284	65	1	8	3	**1**	7	0	0	0	0	0	371
17:00	**10**	311	65	0	9	2	1	12	0	0	0	0	0	410
18:00	2	**324**	77	0	7	1	1	3	1	0	0	0	0	**416**
19:00	0	177	46	0	4	3	0	4	1	0	0	0	0	235
20:00	1	100	19	0	6	1	0	0	0	0	0	0	0	127
21:00	0	74	21	0	1	0	0	0	1	0	0	0	0	97
22:00	0	39	1	0	0	0	0	1	0	0	0	0	0	41
23:00	0	24	7	0	0	0	0	0	0	0	0	0	0	31
Day Total	45	3395	944	62	213	39	15	102	14	3	0	0	0	4832
Percent	0.9%	70.3%	19.5%	1.3%	4.4%	0.8%	0.3%	2.1%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	08:00	08:00	08:00	11:00	07:00	10:00	07:00				07:00
Vol.	4	292	81	12	25	5	4	11	4	2				421
PM Peak	17:00	18:00	12:00	14:00	13:00	12:00	16:00	15:00	13:00	15:00				18:00
Vol.	10	324	79	14	24	5	1	12	2	1				416

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	10	2	0	1	0	0	0	0	0	0	0	0	13
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	11	7	0	0	2	0	0	0	0	0	0	0	20
05:00	0	33	10	0	2	1	0	0	1	0	0	0	0	47
06:00	0	85	22	4	5	**3**	0	2	0	0	0	0	0	121
07:00	**8**	**289**	**79**	8	9	1	**4**	10	1	0	0	0	0	**409**
08:00	4	213	63	**19**	**26**	3	1	5	0	**2**	0	0	0	336
09:00	2	167	47	3	20	1	0	3	1	0	0	0	0	244
10:00	0	183	51	1	15	0	1	6	**3**	1	0	0	0	261
11:00	4	213	60	2	13	0	2	**14**	2	0	0	0	0	310
12 PM	5	214	63	2	14	3	**4**	2	1	0	0	0	0	308
13:00	2	182	53	2	14	1	0	8	**3**	0	0	0	0	265
14:00	5	238	68	**8**	19	**5**	3	5	2	0	**1**	0	0	354
15:00	3	275	80	8	**23**	1	2	9	0	0	0	0	0	401
16:00	**11**	312	**84**	1	8	3	0	**14**	0	**1**	0	0	0	434
17:00	4	**359**	69	0	11	1	1	2	0	0	0	0	0	**447**
18:00	4	284	65	0	5	2	1	4	0	0	0	0	0	365
19:00	3	207	37	0	5	2	2	4	0	0	0	0	0	260
20:00	0	129	24	0	2	1	2	5	0	0	0	0	0	163
21:00	0	69	13	0	2	0	0	0	0	0	0	0	0	84
22:00	0	43	11	0	0	1	0	0	0	0	0	0	0	55
23:00	0	20	7	0	1	0	0	0	0	0	0	0	0	28
Day Total	55	3552	917	58	195	31	23	93	14	4	1	0	0	4943
Percent	1.1%	71.9%	18.6%	1.2%	3.9%	0.6%	0.5%	1.9%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	08:00	06:00	07:00	11:00	10:00	08:00				07:00
Vol.	8	289	79	19	26	3	4	14	3	2				409
PM Peak	16:00	17:00	16:00	14:00	15:00	14:00	12:00	16:00	13:00	16:00	14:00			17:00
Vol.	11	359	84	8	23	5	4	14	3	1	1			447

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	18	3	1	0	0	0	0	0	0	0	0	0	22
01:00	0	8	1	0	1	0	0	0	0	0	0	0	0	10
02:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
03:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
04:00	0	14	7	0	0	2	0	0	**2**	0	0	0	0	25
05:00	0	31	14	0	0	0	0	0	0	0	0	0	0	45
06:00	0	109	21	5	7	2	0	0	0	0	0	0	0	144
07:00	2	**300**	**84**	6	18	1	**4**	5	0	0	0	0	0	**420**
08:00	**3**	193	63	**14**	**27**	1	4	4	0	0	0	0	0	309
09:00	0	160	57	7	15	1	3	**8**	2	0	**1**	0	0	254
10:00	3	187	57	3	15	**5**	1	8	2	0	0	0	0	281
11:00	2	212	75	5	12	2	0	5	0	0	0	0	0	313
12 PM	3	255	70	2	14	1	**2**	4	0	0	0	0	0	351
13:00	3	226	65	7	10	0	2	3	1	0	0	0	0	317
14:00	**6**	260	70	**9**	**19**	1	1	6	**5**	0	0	0	0	377
15:00	4	244	73	5	13	**4**	1	12	0	0	0	0	0	356
16:00	3	287	**75**	0	12	1	1	**13**	1	0	0	0	0	393
17:00	0	**331**	73	1	10	3	2	8	2	0	0	0	0	**430**
18:00	3	240	62	0	5	1	1	5	0	0	0	0	0	317
19:00	3	154	40	0	2	1	0	4	1	0	0	0	0	205
20:00	0	108	22	0	0	0	0	0	0	0	0	0	0	130
21:00	0	49	13	0	2	0	0	0	1	0	0	0	0	65
22:00	0	36	2	0	0	1	0	0	0	0	0	0	0	39
23:00	0	27	5	0	0	0	0	0	0	0	0	0	0	32
Day Total	35	3464	953	65	183	27	22	85	17	0	1	0	0	4852
Percent	0.7%	71.4%	19.6%	1.3%	3.8%	0.6%	0.5%	1.8%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	08:00	08:00	10:00	07:00	09:00	04:00		09:00			07:00
Vol.	3	300	84	14	27	5	4	8	2		1			420
PM Peak	14:00	17:00	16:00	14:00	14:00	15:00	12:00	16:00	14:00					17:00
Vol.	6	331	75	9	19	4	2	13	5					430

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/05/18	0	17	1	0	0	0	0	0	0	0	0	0	0	18
01:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
02:00	0	1	0	0	0	0	0	1	0	0	0	0	0	2
03:00	0	6	2	0	2	0	0	0	0	0	0	0	0	10
04:00	0	10	5	0	1	2	0	0	0	0	0	0	0	18
05:00	0	34	14	0	1	2	0	0	0	0	0	0	0	51
06:00	1	86	17	5	7	1	1	2	0	0	0	0	0	120
07:00	1	**262**	**88**	8	**25**	1	0	8	1	0	0	0	0	**394**
08:00	3	193	71	**17**	18	2	**3**	**12**	2	0	0	0	0	321
09:00	1	157	57	2	15	**5**	0	5	**4**	0	0	0	0	246
10:00	0	166	52	0	12	3	0	2	2	0	0	0	0	237
11:00	**5**	249	72	6	19	3	1	2	2	0	0	0	0	359
12 PM	8	247	69	1	18	1	3	**12**	1	0	0	0	0	360
13:00	3	203	58	0	13	**4**	1	6	**4**	0	0	0	0	292
14:00	3	264	**81**	**6**	**23**	0	**6**	11	2	0	0	0	0	396
15:00	**11**	280	71	6	23	2	6	6	1	0	0	0	0	**406**
16:00	4	**289**	56	2	6	3	3	12	2	0	0	0	0	377
17:00	4	202	34	3	12	1	2	10	2	**1**	0	0	0	271
18:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	44	2676	751	56	195	30	26	89	23	1	0	0	0	3891
Percent	1.1%	68.8%	19.3%	1.4%	5.0%	0.8%	0.7%	2.3%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	07:00	08:00	07:00	09:00	08:00	08:00	09:00					07:00
Vol.	5	262	88	17	25	5	3	12	4					394
PM Peak	15:00	16:00	14:00	14:00	14:00	13:00	14:00	12:00	13:00	17:00				15:00
Vol.	11	289	81	6	23	4	6	12	4	1				406

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak														
Vol.														

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/07/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Day Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak														
Vol.														
PM Peak														
Vol.														

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/08/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	**1**	0	0	0	0	0	0	0	0	0	0	0	**1**
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Percent	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00												11:00
Vol.		1												1
PM Peak														
Vol.														
Grand Total	304	22735	5862	320	1167	216	128	548	91	8	4	0	0	31383
Percent	1.0%	72.4%	18.7%	1.0%	3.7%	0.7%	0.4%	1.7%	0.3%	0.0%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	14	6	117	61	0	0	0	0	0	0	0	0	**1**	0	199	45	48
17:00	17	**31**	**256**	70	1	0	0	0	0	0	0	0	0	0	**375**	42	47
18:00	**42**	28	205	84	0	0	0	0	0	0	0	0	0	0	359	43	47
19:00	32	17	182	**107**	2	0	0	0	0	0	0	0	1	0	341	45	48
20:00	6	4	124	79	**3**	0	0	0	0	0	0	0	0	0	216	46	49
21:00	3	2	118	43	0	0	0	0	0	0	0	0	0	0	166	44	48
22:00	5	2	86	32	1	0	0	0	0	0	0	0	0	0	126	44	48
23:00	1	1	44	19	2	0	0	0	0	0	0	0	0	0	67	45	49
Total	120	91	1132	495	9	0	0	0	0	0	0	0	2	0	1849		
Percent	6.5%	4.9%	61.2%	26.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	18:00 42	17:00 31	17:00 256	19:00 107	20:00 3								16:00 1		17:00 375		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	1	47	15	1	0	0	0	0	0	0	0	0	0	64	44	48
01:00	0	0	25	16	3	0	0	0	0	0	0	0	0	0	44	47	52
02:00	0	1	10	10	0	0	0	0	0	0	0	0	0	0	21	46	48
03:00	0	1	8	1	1	0	0	0	0	0	0	0	0	0	11	43	54
04:00	0	0	2	5	0	0	0	0	0	0	0	0	0	0	7	47	49
05:00	0	2	5	4	0	0	0	0	0	0	0	0	0	0	11	45	48
06:00	0	0	7	7	2	0	0	0	0	0	0	0	0	0	16	49	55
07:00	0	**5**	16	11	0	0	0	0	0	0	0	0	0	0	32	45	48
08:00	0	0	13	16	1	0	0	0	0	0	0	0	0	0	30	47	49
09:00	0	0	33	27	2	0	0	0	0	0	0	0	0	0	62	47	49
10:00	**1**	0	74	51	**7**	0	0	0	0	0	0	0	0	0	133	47	50
11:00	0	3	**121**	**60**	3	0	0	0	0	0	0	0	0	0	**187**	45	48
12 PM	16	**21**	**153**	79	1	0	**1**	0	0	**1**	0	0	0	0	**272**	45	48
13:00	**18**	6	148	**82**	2	0	0	0	0	0	0	0	0	0	256	45	48
14:00	12	11	103	79	2	0	0	0	0	0	0	0	0	0	207	46	48
15:00	7	7	113	79	0	0	0	0	0	0	0	0	0	0	206	46	48
16:00	8	0	96	64	2	0	0	0	0	0	0	0	0	0	170	46	48
17:00	9	2	102	65	1	0	0	0	0	0	0	0	0	0	179	46	48
18:00	6	2	122	72	3	0	0	0	0	0	0	0	0	0	205	46	48
19:00	4	4	86	68	2	0	0	0	0	0	0	0	0	0	164	46	49
20:00	3	5	84	52	**6**	0	0	0	0	0	0	0	0	0	150	46	49
21:00	5	5	90	31	1	0	0	0	0	0	0	0	0	0	132	43	48
22:00	4	1	50	23	0	0	0	0	0	0	0	0	0	0	78	44	48
23:00	1	5	43	16	0	0	0	0	0	0	0	0	0	0	65	43	47
Total	94	82	1551	933	40	0	1	0	0	1	0	0	0	0	2702		
Percent	3.5%	3.0%	57.4%	34.5%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	11:00	11:00	10:00										11:00		
Vol.	1	5	121	60	7										187		
PM Peak	13:00	12:00	12:00	13:00	20:00		12:00			12:00					12:00		
Vol.	18	21	153	82	6		1			1					272		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	**2**	0	36	18	**1**	0	0	0	0	0	0	0	0	0	57	45	48
01:00	0	**3**	21	10	0	0	0	0	0	0	0	0	0	0	34	44	48
02:00	0	0	9	4	0	0	0	0	0	0	0	0	0	0	13	45	48
03:00	0	0	10	6	0	0	0	0	0	0	0	0	0	0	16	46	48
04:00	0	0	5	3	1	0	0	0	0	0	0	0	0	0	9	48	55
05:00	0	0	9	6	1	0	0	0	0	0	0	0	0	0	16	47	52
06:00	0	0	4	4	0	0	0	0	0	0	0	0	0	0	8	47	49
07:00	0	0	3	6	1	0	0	0	0	0	0	0	0	0	10	49	55
08:00	0	0	10	7	1	0	0	0	0	0	0	0	0	0	18	47	51
09:00	0	2	27	19	1	0	0	0	0	0	0	0	0	0	49	46	49
10:00	0	1	24	34	1	0	0	0	0	0	0	0	0	0	60	47	49
11:00	1	0	**57**	**52**	1	0	0	0	0	0	0	0	0	0	**111**	46	49
12 PM	2	3	66	62	1	0	0	0	0	0	0	0	0	0	134	46	49
13:00	3	0	82	81	**4**	0	0	0	0	0	0	0	0	**1**	171	47	49
14:00	**12**	**18**	**143**	76	1	0	0	0	0	0	0	0	0	0	**250**	45	48
15:00	5	4	121	76	1	**1**	0	0	0	**1**	0	0	0	0	209	46	49
16:00	7	6	111	71	0	0	0	0	0	0	0	0	0	0	195	45	48
17:00	4	3	83	77	1	0	0	0	0	0	0	0	0	0	168	46	49
18:00	9	0	77	**82**	1	0	0	0	0	0	0	0	0	0	169	47	49
19:00	6	5	65	70	1	1	0	0	0	0	0	0	0	0	148	47	49
20:00	5	2	74	50	2	0	0	0	0	0	0	0	0	0	133	46	49
21:00	5	3	72	47	0	0	0	0	0	0	0	0	0	0	127	45	48
22:00	3	2	57	27	1	0	0	0	0	0	0	0	0	0	90	45	48
23:00	1	3	17	20	1	0	0	0	0	0	0	0	0	0	42	47	49
Total	65	55	1183	908	22	2	0	0	0	1	0	0	0	1	2237		
Percent	2.9%	2.5%	52.9%	40.6%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	01:00	11:00	11:00	00:00										11:00		
Vol.	2	3	57	52	1										111		
PM Peak	14:00	14:00	14:00	18:00	13:00	15:00				15:00				13:00	14:00		
Vol.	12	18	143	82	4	1				1				1	250		

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WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	1	17	9	1	0	0	0	0	0	0	0	0	0	28	46	49
01:00	0	1	10	3	0	0	0	0	0	0	0	0	0	0	14	43	47
02:00	0	0	5	2	0	0	0	0	0	0	0	0	0	0	7	44	48
03:00	0	0	2	3	1	0	0	0	0	0	0	0	0	0	6	50	56
04:00	0	0	2	5	0	0	0	0	0	0	0	0	0	0	7	47	49
05:00	0	0	7	4	0	0	0	0	0	0	0	0	0	0	11	45	48
06:00	0	0	2	4	0	0	0	0	0	0	0	0	0	0	6	47	49
07:00	0	0	16	20	**3**	0	0	0	0	0	0	0	0	0	39	48	53
08:00	3	16	132	52	1	0	0	0	0	0	0	0	0	0	204	44	48
09:00	**14**	**37**	**227**	**82**	0	0	0	0	0	0	0	0	0	0	**360**	43	47
10:00	14	33	225	81	1	0	0	0	0	0	0	0	0	0	354	43	47
11:00	4	15	132	68	1	0	0	0	0	0	0	0	0	0	220	45	48
12 PM	4	9	120	69	**2**	0	0	0	0	0	0	0	0	0	204	45	48
13:00	10	17	187	48	0	0	0	0	0	0	0	0	0	0	262	41	47
14:00	16	29	230	59	2	0	0	0	0	0	0	0	0	0	336	41	47
15:00	11	26	210	55	2	0	0	0	0	0	0	0	0	0	304	42	47
16:00	3	31	208	67	1	0	0	0	0	0	0	0	0	0	310	43	47
17:00	**50**	**48**	194	55	0	0	0	0	0	0	0	0	0	0	347	40	46
18:00	12	37	**236**	**89**	1	**1**	0	**1**	0	0	0	0	0	0	**377**	43	48
19:00	9	17	214	81	2	0	0	0	0	0	0	0	0	0	323	44	48
20:00	8	7	136	60	1	1	0	0	0	0	0	0	0	0	213	45	48
21:00	2	3	114	43	2	0	0	0	0	0	0	0	0	0	164	44	48
22:00	4	3	107	27	0	0	0	0	0	0	0	0	0	0	141	42	47
23:00	1	0	25	20	0	0	0	0	0	0	0	0	0	0	46	46	48
Total	165	330	2758	1006	21	2	0	1	0	0	0	0	0	0	4283		
Percent	3.9%	7.7%	64.4%	23.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	09:00	07:00										09:00		
Vol.	14	37	227	82	3										360		
PM Peak	17:00	17:00	18:00	18:00	12:00	18:00		18:00							18:00		
Vol.	50	48	236	89	2	1		1							377		

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Longitude: 0' 0.0000 Undefined
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WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	2	0	14	10	**1**	0	0	0	0	0	0	0	0	0	27	46	49
01:00	0	2	12	12	1	0	0	0	0	0	0	0	0	0	27	47	49
02:00	0	0	3	7	0	0	0	0	0	0	0	0	0	0	10	47	49
03:00	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3	47	49
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	38	39
05:00	0	0	5	4	0	0	0	0	0	0	0	0	0	0	9	46	48
06:00	0	1	4	7	0	0	0	0	0	0	0	0	0	0	12	47	49
07:00	0	0	26	21	1	0	0	0	0	0	0	0	0	0	48	47	49
08:00	0	11	144	43	0	0	0	0	0	0	0	0	0	0	198	43	47
09:00	7	44	**244**	**57**	0	0	0	0	0	0	**1**	0	0	0	**353**	40	47
10:00	**9**	**51**	216	54	1	**1**	0	0	0	0	1	0	0	0	333	41	47
11:00	6	34	133	17	0	0	0	0	0	0	0	0	0	0	190	39	44
12 PM	10	69	146	19	0	0	0	0	0	0	0	0	0	0	244	38	43
13:00	12	53	174	22	0	0	**1**	0	0	0	0	0	0	0	262	39	44
14:00	19	**98**	184	22	0	0	0	0	0	0	0	0	0	0	323	38	42
15:00	8	68	189	16	0	0	0	0	0	0	0	0	0	0	281	38	41
16:00	19	95	163	15	0	0	0	0	0	0	0	0	0	0	292	38	40
17:00	**95**	87	164	21	1	0	1	0	0	0	0	0	0	0	369	38	42
18:00	23	28	**297**	56	1	0	0	**1**	0	0	0	0	0	0	**406**	39	46
19:00	11	27	250	**86**	1	0	0	0	0	0	0	0	0	0	375	43	47
20:00	8	11	173	74	1	0	0	1	0	0	0	0	0	0	268	44	48
21:00	5	11	139	39	0	0	0	0	0	0	0	0	0	0	194	42	47
22:00	5	9	92	29	0	0	0	0	0	0	0	0	0	0	135	43	47
23:00	2	1	27	26	**2**	0	0	0	0	0	0	0	0	0	58	47	49
Total	241	700	2802	659	10	1	2	2	0	0	2	0	0	0	4419		
Percent	5.5%	15.8%	63.4%	14.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	09:00	09:00	00:00	10:00					09:00				09:00		
Vol.	9	51	244	57	1	1					1				353		
PM Peak	17:00	14:00	18:00	19:00	23:00		13:00	18:00							18:00		
Vol.	95	98	297	86	2		1	1							406		

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Longitude: 0' 0.0000 Undefined
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WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	0	15	12	0	0	0	0	0	0	0	0	0	0	27	46	48
01:00	0	0	15	7	0	0	0	0	0	0	0	0	0	0	22	45	48
02:00	0	1	6	3	0	0	0	0	0	0	0	0	0	0	10	45	48
03:00	0	0	5	3	0	0	0	0	0	0	0	0	0	0	8	46	48
04:00	0	1	5	2	0	0	0	0	0	0	0	0	0	0	8	43	47
05:00	0	0	5	2	0	0	0	0	0	0	0	0	0	0	7	44	48
06:00	0	1	5	3	0	0	0	0	0	0	0	0	0	0	9	45	48
07:00	2	4	19	14	1	0	0	0	0	0	0	0	0	0	40	46	49
08:00	1	19	127	38	1	0	0	0	0	0	0	0	0	0	186	42	47
09:00	7	**51**	**221**	**77**	1	0	0	0	0	0	0	0	0	0	**357**	43	47
10:00	**15**	30	198	58	**3**	**1**	0	0	0	0	0	0	0	0	305	42	48
11:00	1	34	144	22	0	0	0	0	0	0	0	0	0	0	201	39	45
12 PM	3	58	140	31	0	0	0	0	0	0	0	0	0	0	232	39	46
13:00	13	69	187	18	0	1	0	0	0	0	0	0	0	0	288	38	42
14:00	13	47	208	23	1	**2**	0	0	0	0	0	0	0	0	294	39	44
15:00	23	91	135	13	0	0	0	0	0	0	0	0	0	0	262	38	39
16:00	28	80	144	14	1	0	0	0	0	0	0	0	0	0	267	38	41
17:00	33	**98**	183	15	0	0	0	0	0	0	0	0	0	0	329	38	39
18:00	24	62	**230**	64	0	0	**1**	0	0	0	0	0	0	0	**381**	41	47
19:00	**52**	18	200	59	1	0	0	0	0	0	0	0	0	0	330	41	47
20:00	11	11	201	**67**	0	0	0	0	**1**	0	0	0	0	0	291	43	47
21:00	13	8	141	46	**2**	1	0	0	0	0	0	0	0	0	211	43	48
22:00	9	4	123	40	1	0	0	0	0	0	0	0	0	0	177	43	48
23:00	1	0	47	23	0	0	0	0	0	0	0	0	0	0	71	45	48
Total	249	687	2704	654	12	5	1	0	1	0	0	0	0	0	4313		
Percent	5.8%	15.9%	62.7%	15.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	09:00	09:00	10:00	10:00									09:00		
Vol.	15	51	221	77	3	1									357		
PM Peak	19:00	17:00	18:00	20:00	21:00	14:00	18:00		20:00						18:00		
Vol.	52	98	230	67	2	2	1		1						381		

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Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	0	0	15	11	1	0	0	0	0	0	0	0	0	0	27	47	49
01:00	0	2	15	12	0	0	0	0	0	0	0	0	0	0	29	46	48
02:00	0	0	6	4	0	0	0	0	0	0	0	0	0	0	10	46	48
03:00	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	38	39
04:00	0	0	6	4	0	0	0	0	0	0	0	0	0	0	10	46	48
05:00	0	1	2	3	0	0	0	0	0	0	0	0	0	0	6	47	49
06:00	1	0	7	7	0	0	0	0	0	0	0	0	0	0	15	46	48
07:00	0	1	14	22	**2**	0	0	0	0	0	0	0	0	0	39	48	50
08:00	2	17	120	38	2	0	0	0	0	0	0	0	0	0	179	43	48
09:00	2	**36**	**244**	61	2	**1**	**1**	0	0	0	0	**1**	0	0	**348**	42	47
10:00	**8**	21	215	**76**	1	0	0	0	0	0	0	0	0	0	321	43	48
11:00	5	21	170	59	1	0	0	0	0	0	0	0	0	0	256	43	48
12 PM	5	12	166	55	1	0	0	0	0	0	0	0	0	0	239	43	48
13:00	7	39	194	41	2	0	0	0	0	0	0	0	0	0	283	40	47
14:00	14	40	224	40	2	0	0	0	0	0	0	0	**1**	0	321	39	46
15:00	6	24	202	48	1	0	**1**	0	0	0	0	0	0	0	282	41	47
16:00	26	54	141	59	0	0	0	0	0	0	0	0	0	0	280	42	47
17:00	**88**	**69**	168	35	0	0	1	0	**1**	0	0	0	0	0	362	39	45
18:00	27	34	219	**67**	0	0	1	0	1	0	0	0	0	0	349	42	47
19:00	45	49	**225**	47	0	0	0	0	0	0	0	0	0	0	**366**	39	46
20:00	14	15	186	54	**3**	0	0	0	0	0	0	0	0	0	272	43	48
21:00	13	23	129	18	0	0	0	0	0	0	0	0	0	0	183	39	44
22:00	3	6	84	15	1	0	0	0	0	0	0	0	0	0	109	39	47
23:00	0	4	39	12	2	0	0	0	0	0	0	0	0	0	57	44	49
Total	266	468	2794	788	21	1	4	0	2	0	0	1	1	0	4346		
Percent	6.1%	10.8%	64.3%	18.1%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	09:00	10:00	07:00	09:00	09:00					09:00			09:00		
Vol.	8	36	244	76	2	1	1					1			348		
PM Peak	17:00	17:00	19:00	18:00	20:00		15:00		17:00				14:00		19:00		
Vol.	88	69	225	67	3		1		1				1		366		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/05/18	0	0	25	14	0	0	0	0	0	0	0	0	0	0	39	45	48
01:00	0	0	11	12	0	0	0	0	0	0	0	0	0	0	23	47	49
02:00	0	0	5	1	0	0	0	0	0	0	0	0	0	0	6	40	46
03:00	0	0	3	2	0	0	0	0	0	0	0	0	0	0	5	46	48
04:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	45	48
05:00	0	0	3	8	0	0	0	0	0	0	0	0	0	0	11	47	49
06:00	0	0	4	8	2	0	0	0	0	0	0	0	0	0	14	49	56
07:00	0	2	25	26	3	0	0	0	0	0	0	0	0	0	56	47	50
08:00	0	17	122	39	1	**1**	**1**	0	0	0	0	0	0	0	181	43	48
09:00	**14**	26	**216**	**81**	3	0	0	**1**	0	0	0	0	0	0	**341**	44	48
10:00	8	**32**	192	71	**4**	0	0	1	0	0	0	0	0	0	308	44	48
11:00	12	32	144	48	0	0	0	0	0	0	0	0	0	0	236	42	47
12 PM	13	17	179	53	**1**	0	0	0	0	0	0	0	0	0	263	42	47
13:00	4	19	213	**63**	0	0	0	0	0	0	0	0	0	0	299	42	47
14:00	11	31	**236**	49	0	0	0	0	0	0	0	0	0	0	327	40	46
15:00	**16**	**47**	216	51	1	0	0	0	0	0	0	0	0	0	**331**	40	46
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	78	223	1596	527	15	1	1	2	0	0	0	0	0	0	2443		
Percent	3.2%	9.1%	65.3%	21.6%	0.6%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	09:00	09:00	10:00	08:00	08:00	09:00							09:00		
Vol.	14	32	216	81	4	1	1	1							341		
PM Peak	15:00	15:00	14:00	13:00	12:00										15:00		
Vol.	16	47	236	63	1										331		
Total	1278	2636	16520	5970	150	12	9	5	3	2	2	1	3	1	26592		
Percent	4.8%	9.9%	62.1%	22.5%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 43 MPH
95th Percentile : 48 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 16558
Percent in Pace : 62.3%
Number of Vehicles > 55 MPH : 113
Percent of Vehicles > 55 MPH : 0.4%
Mean Speed(Average) : 36 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	8	**16**	191	68	0	0	0	0	0	0	0	0	0	0	283	43	47
17:00	15	9	243	106	1	0	0	0	0	0	0	0	0	0	374	44	48
18:00	**19**	13	**262**	89	3	**1**	**1**	0	0	0	0	0	0	0	**388**	44	48
19:00	7	15	213	**137**	**4**	0	0	0	0	0	0	0	0	0	376	46	48
20:00	14	10	149	84	2	0	0	0	0	0	0	0	0	0	259	45	48
21:00	10	3	123	47	3	0	0	0	0	0	0	0	0	0	186	44	48
22:00	2	9	127	35	1	0	0	0	0	0	0	0	0	0	174	42	47
23:00	4	1	52	49	2	0	0	0	0	0	0	0	0	0	108	47	49
Total	79	76	1360	615	16	1	1	0	0	0	0	0	0	0	2148		
Percent	3.7%	3.5%	63.3%	28.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	18:00	16:00	18:00	19:00	19:00	18:00	18:00								18:00		
Vol.	19	16	262	137	4	1	1								388		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	0	61	19	2	0	0	0	0	0	0	0	0	0	82	44	48
01:00	0	2	28	22	0	0	0	0	0	0	0	0	0	0	52	46	48
02:00	0	2	17	9	0	0	0	0	0	0	0	0	0	0	28	45	48
03:00	0	1	5	8	0	**1**	0	0	0	0	0	0	0	0	15	48	62
04:00	0	2	7	3	1	0	0	0	0	0	0	0	0	0	13	46	53
05:00	0	1	3	1	0	0	0	0	0	0	0	0	0	0	5	42	47
06:00	0	1	6	5	0	0	0	0	0	0	0	0	0	0	12	46	48
07:00	0	1	6	9	0	0	0	0	0	0	0	0	0	0	16	47	49
08:00	0	2	30	18	2	0	0	0	0	0	0	0	0	0	52	46	49
09:00	1	4	48	35	2	0	0	0	0	0	0	0	0	0	90	46	49
10:00	1	1	67	39	**3**	0	0	0	0	0	0	0	0	0	111	46	49
11:00	**2**	**5**	**139**	**67**	3	0	0	0	0	0	0	0	0	0	**216**	45	48
12 PM	4	4	177	73	2	0	0	0	0	0	0	0	0	0	260	44	48
13:00	9	7	**179**	82	3	0	0	0	0	0	0	0	0	0	**280**	45	48
14:00	5	4	158	**83**	5	0	0	0	0	0	0	0	0	0	255	45	49
15:00	4	4	118	69	1	**1**	0	0	0	0	0	0	0	0	197	46	48
16:00	5	**10**	126	79	2	1	0	0	0	0	0	0	0	0	223	46	48
17:00	2	10	133	62	2	0	0	0	0	0	0	0	0	0	209	45	48
18:00	6	5	154	69	4	0	0	0	0	0	0	0	0	0	238	45	48
19:00	**12**	7	140	64	**6**	0	0	0	0	0	0	0	0	0	229	45	49
20:00	6	3	105	60	2	0	0	0	0	0	0	0	0	0	176	45	48
21:00	5	9	83	35	3	0	0	0	0	0	0	0	0	0	135	45	48
22:00	3	2	54	43	0	0	0	0	0	0	0	0	0	0	102	46	48
23:00	0	0	52	36	2	0	0	0	0	0	0	0	0	0	90	46	49
Total	65	87	1896	990	45	3	0	0	0	0	0	0	0	0	3086		
Percent	2.1%	2.8%	61.4%	32.1%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	10:00	03:00									11:00		
Vol.	2	5	139	67	3	1									216		
PM Peak	19:00	16:00	13:00	14:00	19:00	15:00									13:00		
Vol.	12	10	179	83	6	1									280		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	1	1	37	13	1	0	0	0	0	0	0	0	0	0	53	44	48
01:00	0	0	22	17	2	0	0	0	0	0	0	0	0	0	41	47	49
02:00	0	0	23	10	0	0	0	0	0	0	0	0	0	0	33	45	48
03:00	0	0	10	1	1	0	0	0	0	0	0	0	0	0	12	42	54
04:00	0	1	9	5	0	0	0	0	0	0	0	0	0	0	15	45	48
05:00	0	1	6	2	0	0	0	0	0	0	0	0	0	0	9	43	47
06:00	0	1	4	2	0	0	0	0	0	0	0	0	0	0	7	44	48
07:00	0	0	7	8	1	0	0	0	0	0	0	0	0	0	16	48	52
08:00	0	0	13	14	2	0	0	0	0	0	0	0	0	0	29	48	52
09:00	0	1	39	12	0	0	0	0	0	0	0	0	0	0	52	43	47
10:00	0	0	37	47	**3**	0	0	0	0	0	0	0	0	0	87	47	49
11:00	**6**	**3**	**82**	**49**	3	0	0	0	0	0	0	0	0	0	**143**	46	49
12 PM	**8**	5	112	84	2	0	0	0	0	0	0	0	0	0	211	46	48
13:00	0	4	102	66	2	**1**	0	0	0	0	0	0	0	0	175	46	49
14:00	7	6	133	85	3	0	0	0	**1**	0	0	0	0	0	235	46	49
15:00	4	**8**	139	79	0	0	0	0	0	0	0	0	0	0	230	45	48
16:00	1	4	**142**	**103**	4	0	0	0	0	0	0	0	0	0	**254**	46	49
17:00	6	6	137	92	2	0	0	0	0	0	0	0	0	0	243	46	48
18:00	8	3	132	82	**8**	0	0	**1**	0	**1**	0	0	0	0	235	46	49
19:00	4	1	97	96	4	1	0	0	0	0	0	0	0	0	203	47	49
20:00	6	1	85	69	0	1	0	0	0	0	0	0	0	0	162	46	48
21:00	3	4	87	37	1	0	0	0	0	0	0	0	0	0	132	44	48
22:00	2	1	64	29	2	0	0	0	0	0	0	0	0	0	98	45	49
23:00	1	0	43	28	1	0	0	0	0	0	0	0	0	0	73	46	49
Total	57	51	1562	1030	42	3	0	1	1	1	0	0	0	0	2748		
Percent	2.1%	1.9%	56.8%	37.5%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	10:00										11:00		
Vol.	6	3	82	49	3										143		
PM Peak	12:00	15:00	16:00	16:00	18:00	13:00		18:00	14:00	18:00					16:00		
Vol.	8	8	142	103	8	1		1	1	1					254		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	0	21	14	0	0	0	0	0	0	0	0	0	0	35	46	48
01:00	0	1	8	11	0	0	0	0	0	0	0	0	0	0	20	47	49
02:00	0	0	5	3	0	0	0	0	0	0	0	0	0	0	8	46	48
03:00	0	0	5	1	0	0	0	0	0	0	0	0	0	0	6	40	46
04:00	0	0	4	2	0	0	0	0	0	0	0	0	0	0	6	45	48
05:00	0	0	5	2	0	0	0	0	0	0	0	0	0	0	7	44	48
06:00	0	1	7	12	**3**	0	0	0	0	0	0	0	0	0	23	49	56
07:00	2	0	18	33	2	0	0	0	0	0	0	0	0	0	55	48	49
08:00	0	1	62	54	3	0	0	0	0	0	0	0	0	0	120	47	49
09:00	2	8	**292**	**111**	1	0	0	0	0	0	0	0	0	0	**414**	44	48
10:00	**14**	**25**	230	89	2	0	0	0	0	0	0	0	**1**	0	361	44	48
11:00	2	11	131	78	1	**1**	0	0	0	0	0	0	0	0	224	45	48
12 PM	7	2	163	85	1	0	0	0	0	0	0	0	0	0	258	45	48
13:00	16	14	196	82	1	**2**	0	0	0	0	0	0	0	0	311	44	48
14:00	13	24	267	48	1	0	0	0	0	0	0	0	0	0	353	39	46
15:00	10	5	204	82	2	0	0	0	0	0	0	0	0	0	303	44	48
16:00	9	13	**301**	86	1	0	0	0	0	0	0	0	0	0	410	42	47
17:00	5	**29**	285	73	**3**	0	0	0	0	0	0	0	0	**1**	396	42	47
18:00	10	15	250	108	3	0	0	0	0	0	0	0	0	0	386	44	48
19:00	**17**	11	282	**128**	1	1	0	0	0	0	0	0	0	0	**440**	45	48
20:00	14	1	193	77	3	0	**1**	0	0	0	0	0	**1**	0	290	45	48
21:00	9	3	146	62	0	0	0	0	0	0	0	0	0	0	220	44	48
22:00	1	1	89	40	1	0	0	0	0	0	0	0	0	0	132	45	48
23:00	0	2	44	23	2	0	0	0	0	0	0	0	0	0	71	46	49
Total	131	167	3208	1304	31	4	1	0	0	0	0	0	2	1	4849		
Percent	2.7%	3.4%	66.2%	26.9%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	09:00	09:00	06:00	11:00							10:00		09:00		
Vol.	14	25	292	111	3	1							1		414		
PM Peak	19:00	17:00	16:00	19:00	17:00	13:00	20:00						20:00	17:00	19:00		
Vol.	17	29	301	128	3	2	1						1	1	440		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	2	0	23	10	1	0	0	0	0	0	0	0	0	0	36	45	49
01:00	0	0	7	10	1	0	0	0	0	0	0	0	0	0	18	48	51
02:00	0	0	4	3	0	0	0	0	0	0	0	0	0	0	7	46	48
03:00	0	0	3	2	0	0	0	0	0	0	0	0	0	0	5	46	48
04:00	0	0	2	3	0	0	0	0	0	0	0	0	0	0	5	47	49
05:00	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	48	49
06:00	0	0	6	9	1	0	0	0	0	0	0	0	0	0	16	48	52
07:00	0	2	20	34	**2**	0	0	0	0	0	0	0	0	0	58	48	49
08:00	3	3	74	46	2	0	0	0	0	0	0	0	0	0	128	46	49
09:00	5	19	**283**	**111**	2	0	0	0	0	0	0	0	0	0	**420**	44	48
10:00	**7**	**21**	225	75	1	0	0	0	**1**	0	0	0	0	0	330	43	48
11:00	5	11	169	69	0	0	0	0	0	0	0	0	0	0	254	44	48
12 PM	12	22	162	49	2	0	0	0	0	0	**1**	0	0	0	248	43	48
13:00	9	22	214	56	1	0	0	0	0	0	0	0	0	0	302	42	47
14:00	5	28	262	40	0	0	0	0	0	0	0	0	0	0	335	39	45
15:00	7	15	225	60	0	0	0	0	0	0	0	0	0	0	307	42	47
16:00	14	**37**	247	58	**4**	**2**	0	0	**1**	0	0	0	0	0	363	41	48
17:00	14	23	228	49	1	0	0	0	1	0	0	0	0	0	316	40	47
18:00	10	18	251	**91**	2	0	0	0	0	0	0	0	0	0	372	44	48
19:00	**16**	17	285	89	2	1	0	0	0	0	0	0	0	0	410	43	48
20:00	4	20	**306**	83	3	0	0	0	0	0	0	0	0	0	**416**	42	47
21:00	5	13	164	53	0	0	0	0	0	0	0	0	0	0	235	43	47
22:00	2	1	69	55	1	0	0	0	0	0	0	0	0	0	128	46	49
23:00	4	1	67	24	1	0	0	0	0	0	0	0	0	0	97	44	48
Total	124	273	3296	1083	27	3	0	0	3	0	1	0	0	0	4810		
Percent	2.6%	5.7%	68.5%	22.5%	0.6%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	09:00	09:00	07:00				10:00						09:00		
Vol.	7	21	283	111	2				1						420		
PM Peak	19:00	16:00	20:00	18:00	16:00	16:00			16:00		12:00				20:00		
Vol.	16	37	306	91	4	2			1		1				416		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	2	18	20	1	0	0	0	0	0	0	0	0	0	41	47	49
01:00	0	0	19	12	0	0	0	0	0	0	0	0	0	0	31	46	48
02:00	0	1	8	4	0	0	0	0	0	0	0	0	0	0	13	45	48
03:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	6	47	49
04:00	0	0	4	1	0	0	0	0	0	0	0	0	0	0	5	42	47
05:00	0	0	3	4	0	0	0	0	0	0	0	0	0	0	7	47	49
06:00	0	0	11	9	0	0	0	0	0	0	0	0	0	0	20	46	48
07:00	0	2	16	26	3	0	0	0	0	0	0	0	0	0	47	48	52
08:00	1	3	67	46	**4**	0	0	0	0	0	0	0	0	0	121	46	49
09:00	**12**	13	**285**	**99**	1	0	0	0	0	0	0	0	0	0	**410**	43	48
10:00	6	**19**	240	68	1	0	0	0	**1**	0	0	0	0	0	335	42	47
11:00	5	12	158	67	2	0	0	0	0	0	0	0	0	0	244	44	48
12 PM	8	12	180	61	0	0	0	0	0	0	0	0	0	0	261	43	47
13:00	15	14	232	49	1	0	0	0	0	0	0	0	0	0	311	40	47
14:00	18	20	219	49	2	0	0	0	0	0	0	0	0	0	308	41	47
15:00	6	9	187	60	2	**1**	0	0	0	0	0	0	0	0	265	43	48
16:00	19	**30**	233	71	1	0	0	0	0	0	0	0	0	0	354	42	47
17:00	17	30	290	62	**3**	0	0	0	0	0	0	0	0	0	402	40	47
18:00	**24**	17	271	117	2	1	**1**	0	0	0	0	0	0	0	433	44	48
19:00	11	16	**291**	**128**	1	0	0	0	0	0	0	0	0	0	**447**	44	48
20:00	9	10	260	86	0	0	0	0	0	0	0	0	0	0	365	43	47
21:00	8	14	191	45	2	0	0	0	0	0	0	0	0	0	260	41	47
22:00	5	5	106	45	1	1	0	0	0	0	0	0	0	0	163	45	48
23:00	1	1	51	29	2	0	0	0	0	0	0	0	0	0	84	46	49
Total	165	230	3343	1161	29	3	1	0	1	0	0	0	0	0	4933		
Percent	3.3%	4.7%	67.8%	23.5%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	09:00	09:00	08:00				10:00						09:00		
Vol.	12	19	285	99	4				1						410		
PM Peak	18:00	16:00	19:00	19:00	17:00	15:00	18:00								19:00		
Vol.	24	30	291	128	3	1	1								447		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	1	2	26	22	**3**	**1**	0	0	0	0	0	0	0	0	55	48	54
01:00	0	0	19	9	0	0	0	0	0	0	0	0	0	0	28	45	48
02:00	0	2	17	3	0	0	0	0	0	0	0	0	0	0	22	39	46
03:00	0	0	5	5	0	0	0	0	0	0	0	0	0	0	10	47	49
04:00	0	0	5	5	0	1	0	0	0	0	0	0	0	0	11	48	64
05:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	6	47	49
06:00	1	0	8	16	0	0	0	0	0	0	0	0	0	0	25	47	49
07:00	0	1	15	28	1	0	0	0	0	0	0	0	0	0	45	47	49
08:00	0	7	78	56	3	0	0	0	0	0	0	0	0	0	144	46	49
09:00	2	12	**301**	**104**	1	0	0	0	0	0	0	0	0	0	**420**	44	48
10:00	6	**27**	210	65	1	0	0	0	0	0	0	0	0	0	309	43	47
11:00	**10**	10	160	74	0	0	0	0	0	0	0	0	0	0	254	44	48
12 PM	8	5	202	63	2	**1**	0	0	0	0	0	0	0	0	281	43	48
13:00	6	20	233	49	**4**	1	0	0	0	0	0	0	0	0	313	41	47
14:00	6	21	253	67	3	0	0	0	0	0	0	0	0	0	350	42	47
15:00	6	27	223	62	0	0	0	0	0	0	0	0	0	0	318	42	47
16:00	**17**	17	279	66	0	0	0	0	0	0	0	0	0	0	379	41	47
17:00	15	**32**	241	67	2	0	0	0	0	0	0	0	0	0	357	42	47
18:00	16	25	259	88	4	0	0	0	0	0	0	0	0	0	392	43	48
19:00	13	18	**289**	**107**	4	0	0	0	0	0	0	0	0	0	**431**	44	48
20:00	10	11	229	67	1	0	0	0	0	0	0	0	0	0	318	43	47
21:00	9	17	145	33	1	0	0	0	0	0	0	0	0	0	205	41	47
22:00	2	15	97	15	1	0	0	0	0	0	0	0	0	0	130	39	46
23:00	0	7	42	16	0	0	0	0	0	0	0	0	0	0	65	43	47
Total	128	276	3339	1090	31	4	0	0	0	0	0	0	0	0	4868		
Percent	2.6%	5.7%	68.6%	22.4%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	10:00	09:00	09:00	00:00	00:00									09:00		
Vol.	10	27	301	104	3	1									420		
PM Peak	16:00	17:00	19:00	19:00	13:00	12:00									19:00		
Vol.	17	32	289	107	4	1									431		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greeenbag Rd
Location: East of Dorsey
Weather: Clear
Counter: TSTD

Site Code:
Station ID: EofDorsey

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/05/18	1	1	22	15	0	0	0	0	0	0	0	0	0	0	39	46	48
01:00	0	0	21	11	0	0	0	0	0	0	0	0	0	0	32	45	48
02:00	0	1	12	5	0	0	0	0	0	0	0	0	0	0	18	44	48
03:00	0	0	6	4	0	0	0	0	0	0	0	0	0	0	10	46	48
04:00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	47	49
05:00	0	0	5	4	1	0	0	0	0	0	0	0	0	0	10	48	55
06:00	0	0	9	9	0	0	0	0	0	0	0	0	0	0	18	46	49
07:00	0	0	27	24	1	0	0	0	0	0	0	0	0	0	52	47	49
08:00	2	2	56	56	**4**	0	0	0	0	0	0	0	0	0	120	47	49
09:00	4	**20**	**281**	**89**	1	0	0	0	0	0	0	0	0	0	**395**	43	47
10:00	**14**	15	225	66	2	0	0	0	0	0	0	0	0	0	322	42	47
11:00	9	8	171	58	1	0	0	0	0	0	0	0	0	0	247	43	48
12 PM	4	11	169	52	**2**	0	0	0	0	0	0	0	0	0	238	43	48
13:00	11	20	254	**72**	1	0	0	**1**	0	0	0	0	0	0	359	42	47
14:00	**14**	**31**	**263**	51	0	0	0	0	0	0	0	**1**	0	0	**360**	39	46
15:00	13	17	198	64	0	0	**1**	0	0	0	0	0	0	0	293	43	47
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	72	127	1719	581	13	0	1	1	0	0	0	1	0	0	2515		
Percent	2.9%	5.0%	68.3%	23.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	09:00	09:00	08:00										09:00		
Vol.	14	20	281	89	4										395		
PM Peak	14:00	14:00	14:00	13:00	12:00		15:00	13:00				14:00			14:00		
Vol.	14	31	263	72	2		1	1				1			360		
Total	821	1287	19723	7854	234	21	4	2	5	1	1	1	2	1	29957		
Percent	2.7%	4.3%	65.8%	26.2%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	31-40 MPH
Number in Pace :	19749
Percent in Pace :	65.9%
Number of Vehicles > 55 MPH :	155
Percent of Vehicles > 55 MPH :	0.5%
Mean Speed(Average) :	37 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	13	283	**80**	**1**	**11**	0	3	**8**	**2**	0	0	0	0	401
16:00	8	335	74	1	8	**2**	**4**	6	1	0	0	0	0	439
17:00	**19**	**351**	68	0	5	0	0	8	0	0	0	0	0	**451**
18:00	6	249	30	0	6	0	0	6	0	0	0	0	0	297
19:00	3	183	36	0	3	0	0	2	0	0	0	0	0	227
20:00	3	153	34	0	2	0	0	2	1	0	0	0	0	195
21:00	2	96	15	0	1	0	0	0	0	0	0	0	0	114
22:00	0	68	11	0	1	0	0	0	0	0	0	0	0	80
23:00	0	45	8	0	1	0	0	0	0	0	0	0	0	54
Day Total	54	1763	356	2	38	2	7	32	4	0	0	0	0	2258
Percent	2.4%	78.1%	15.8%	0.1%	1.7%	0.1%	0.3%	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	17:00 19	17:00 351	15:00 80	15:00 1	15:00 11	16:00 2	16:00 4	15:00 8	15:00 2					17:00 451

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	28	3	0	0	0	0	0	0	0	0	0	0	31
01:00	0	17	0	0	0	0	0	0	0	0	0	0	0	17
02:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
03:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
04:00	0	16	7	0	0	0	0	0	0	0	0	0	0	23
05:00	0	15	7	0	0	0	0	0	0	0	0	0	0	22
06:00	2	48	15	0	2	0	0	0	0	0	0	0	0	67
07:00	1	74	29	0	1	0	0	0	0	0	0	0	0	105
08:00	2	98	26	0	4	1	0	1	0	0	0	0	0	132
09:00	2	166	48	**1**	4	1	0	4	0	0	0	0	0	226
10:00	**10**	209	45	0	**5**	0	0	7	0	0	0	0	0	276
11:00	10	**249**	**54**	0	4	**2**	0	**8**	0	0	0	0	0	**327**
12 PM	5	215	**52**	0	3	0	0	6	0	0	0	0	0	**281**
13:00	**8**	167	39	**1**	0	0	**3**	**7**	0	0	0	0	0	225
14:00	4	196	40	0	**4**	0	1	3	0	0	0	0	0	248
15:00	6	191	31	0	1	0	0	3	0	0	0	0	0	232
16:00	5	**223**	40	0	3	**1**	0	1	0	0	0	0	0	273
17:00	3	188	28	0	2	0	3	3	0	0	0	0	0	227
18:00	0	164	34	0	2	0	0	1	0	0	0	0	0	201
19:00	0	135	22	0	0	0	1	2	0	0	0	0	0	160
20:00	0	96	20	0	2	0	0	0	0	0	0	0	0	118
21:00	0	71	16	0	0	0	0	0	0	0	0	0	0	87
22:00	0	42	9	0	2	0	0	0	0	0	0	0	0	53
23:00	1	45	4	0	0	0	0	0	0	0	0	0	0	50
Day Total	59	2673	571	2	39	5	8	46	0	0	0	0	0	3403
Percent	1.7%	78.5%	16.8%	0.1%	1.1%	0.1%	0.2%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	09:00	10:00	11:00		11:00						11:00
Vol.	10	249	54	1	5	2		8						327
PM Peak	13:00	16:00	12:00	13:00	14:00	16:00	13:00	13:00						12:00
Vol.	8	223	52	1	4	1	3	7						281

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	28	8	0	1	0	0	1	0	0	0	0	0	38
01:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
02:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
03:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
04:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
05:00	0	17	5	0	0	0	0	0	0	0	0	0	0	22
06:00	0	29	6	0	1	0	0	0	0	0	0	0	0	36
07:00	1	49	16	0	0	0	0	0	0	0	0	0	0	66
08:00	2	79	12	0	0	0	**1**	0	0	0	0	0	0	94
09:00	2	105	21	0	**3**	0	0	0	0	0	0	0	0	131
10:00	3	146	37	**1**	2	0	0	1	0	0	0	0	0	190
11:00	**6**	**168**	**40**	0	2	0	0	**3**	0	0	0	0	0	**219**
12 PM	8	**269**	49	0	**5**	0	2	2	0	0	0	0	0	**335**
13:00	**12**	207	47	0	4	0	1	**9**	0	0	0	0	0	280
14:00	10	246	**54**	**1**	3	0	**5**	2	0	0	0	0	0	321
15:00	11	194	35	0	2	0	0	5	0	0	**1**	0	0	248
16:00	7	184	49	0	5	0	2	4	0	0	0	0	0	251
17:00	8	180	26	0	3	0	0	3	0	0	0	0	0	220
18:00	3	160	23	0	3	0	1	4	0	0	0	0	0	194
19:00	5	118	25	0	4	0	0	5	0	0	0	0	0	157
20:00	4	87	14	0	1	0	1	4	0	0	0	0	0	111
21:00	0	70	12	0	0	0	0	0	0	0	0	0	0	82
22:00	0	34	4	0	0	0	0	0	0	0	0	0	0	38
23:00	0	22	4	0	1	0	0	0	0	0	0	0	0	27
Day Total	82	2430	495	2	40	0	13	43	0	0	1	0	0	3106
Percent	2.6%	78.2%	15.9%	0.1%	1.3%	0.0%	0.4%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	10:00	09:00		08:00	11:00						11:00
Vol.	6	168	40	1	3		1	3						219
PM Peak	13:00	12:00	14:00	14:00	12:00		14:00	13:00			15:00			12:00
Vol.	12	269	54	1	5		5	9			1			335

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	5	1	1	0	0	0	0	0	0	0	0	0	7
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
04:00	0	21	7	0	0	1	0	0	0	0	0	0	0	29
05:00	0	56	14	0	1	1	0	0	0	0	0	0	0	72
06:00	3	124	32	4	3	0	1	1	**1**	0	0	0	0	169
07:00	7	250	85	**7**	13	0	**2**	10	1	0	0	0	0	375
08:00	4	**261**	**87**	6	**16**	2	2	**16**	1	0	0	0	0	**395**
09:00	2	178	58	1	9	**5**	0	3	0	0	0	0	0	256
10:00	**8**	175	61	0	8	1	1	4	0	**2**	0	0	0	260
11:00	2	252	60	2	9	1	1	6	0	0	0	0	0	333
12 PM	8	264	91	1	10	1	3	10	**1**	0	0	0	0	389
13:00	8	211	65	3	12	**2**	2	4	0	0	0	0	0	307
14:00	12	294	84	**11**	**17**	1	**6**	5	0	0	0	0	0	430
15:00	6	328	**98**	2	12	0	3	6	0	0	0	0	0	455
16:00	9	316	77	4	8	0	4	**12**	1	0	0	0	0	431
17:00	10	**361**	76	0	6	1	0	10	0	0	0	0	0	**464**
18:00	**13**	232	43	0	5	0	0	11	1	0	0	0	0	305
19:00	3	184	54	0	4	1	0	3	0	0	0	0	0	249
20:00	2	141	19	0	1	0	0	2	0	0	0	0	0	165
21:00	0	73	14	0	1	0	0	0	0	0	0	0	0	88
22:00	0	33	7	0	0	0	0	0	0	0	0	0	0	40
23:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
Day Total	97	3801	1036	42	135	17	25	103	6	2	0	0	0	5264
Percent	1.8%	72.2%	19.7%	0.8%	2.6%	0.3%	0.5%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	08:00	07:00	08:00	09:00	07:00	08:00	06:00	10:00				08:00
Vol.	8	261	87	7	16	5	2	16	1	2				395
PM Peak	18:00	17:00	15:00	14:00	14:00	13:00	14:00	16:00	12:00					17:00
Vol.	13	361	98	11	17	2	6	12	1					464

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	15	2	0	0	0	0	0	0	0	0	0	0	17
01:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	16	8	0	0	1	0	1	0	0	0	0	0	26
05:00	0	57	18	0	1	1	0	0	1	0	0	0	0	78
06:00	1	119	28	5	6	0	1	2	0	0	0	0	0	162
07:00	6	**269**	80	**6**	13	1	3	5	2	0	0	0	0	**385**
08:00	**11**	236	74	4	**15**	**4**	3	**12**	**3**	0	0	0	0	362
09:00	8	196	68	2	9	1	2	6	1	0	0	0	0	293
10:00	9	192	63	3	5	2	0	8	3	0	0	0	0	285
11:00	11	220	**85**	5	11	3	**4**	12	2	**1**	0	0	0	354
12 PM	16	235	67	0	9	**2**	**5**	12	**2**	0	0	0	0	348
13:00	**19**	220	70	3	**23**	0	4	4	1	0	**1**	0	0	345
14:00	14	262	76	**14**	16	1	2	**15**	1	0	0	0	0	401
15:00	14	280	**97**	2	12	0	2	9	0	0	0	0	0	416
16:00	18	328	64	3	4	0	3	11	0	0	0	0	0	431
17:00	7	333	64	0	5	0	0	8	1	0	0	0	0	418
18:00	16	**357**	70	0	4	0	0	10	0	0	0	0	0	**457**
19:00	2	211	56	0	4	0	2	3	0	0	0	0	0	278
20:00	0	122	30	0	2	0	1	2	0	0	0	0	0	157
21:00	0	87	22	0	1	0	0	0	0	0	0	0	0	110
22:00	0	44	3	0	0	0	0	0	0	0	0	0	0	47
23:00	0	24	7	0	0	0	0	0	0	0	0	0	0	31
Day Total	152	3836	1053	47	142	16	32	120	17	1	1	0	0	5417
Percent	2.8%	70.8%	19.4%	0.9%	2.6%	0.3%	0.6%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	11:00	07:00	08:00	08:00	11:00	08:00	08:00	11:00				07:00
Vol.	11	269	85	6	15	4	4	12	3	1				385
PM Peak	13:00	18:00	15:00	14:00	13:00	12:00	12:00	14:00	12:00		13:00			18:00
Vol.	19	357	97	14	23	2	5	15	2		1			457

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	17	3	0	0	0	0	0	0	0	0	0	0	20
01:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
04:00	0	16	5	0	0	2	0	0	0	0	0	0	0	23
05:00	0	48	12	0	1	1	0	0	1	0	0	0	0	63
06:00	0	132	33	4	1	1	0	2	0	0	0	0	0	173
07:00	11	**278**	**76**	**9**	11	1	2	**13**	1	0	0	0	0	**402**
08:00	11	276	76	5	**15**	**3**	**5**	6	0	0	0	0	0	397
09:00	4	180	59	3	9	2	1	5	**2**	**1**	0	0	0	266
10:00	**12**	201	53	1	9	0	4	6	1	1	0	0	0	288
11:00	6	243	68	5	10	0	2	11	0	0	0	0	0	345
12 PM	**16**	239	64	1	14	1	3	6	1	0	0	0	0	345
13:00	9	190	60	4	6	0	3	9	1	0	0	0	0	282
14:00	5	277	71	**8**	11	**2**	2	4	1	0	0	0	0	381
15:00	13	301	**80**	1	**15**	0	**4**	9	**2**	0	0	0	0	425
16:00	16	310	76	5	3	1	2	**22**	0	0	0	0	0	435
17:00	12	**361**	78	0	4	1	4	9	0	0	0	0	0	**469**
18:00	9	281	49	0	7	0	0	9	0	0	0	0	0	355
19:00	7	254	49	0	5	0	1	6	0	0	0	0	0	322
20:00	0	185	32	0	3	0	0	1	0	0	0	0	0	221
21:00	0	83	17	0	2	0	0	1	0	0	0	0	0	103
22:00	1	41	10	0	0	0	0	1	0	0	0	0	0	53
23:00	0	24	8	0	1	0	0	0	0	0	0	0	0	33
Day Total	132	3956	983	46	127	15	33	120	10	2	0	0	0	5424
Percent	2.4%	72.9%	18.1%	0.8%	2.3%	0.3%	0.6%	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	07:00	08:00	08:00	08:00	07:00	09:00	09:00				07:00
Vol.	12	278	76	9	15	3	5	13	2	1				402
PM Peak	12:00	17:00	15:00	14:00	15:00	14:00	15:00	16:00	15:00					17:00
Vol.	16	361	80	8	15	2	4	22	2					469

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	20	5	0	0	0	0	0	0	0	0	0	0	25
01:00	0	11	1	1	0	0	0	0	0	0	0	0	0	13
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
04:00	0	19	7	0	0	2	1	0	2	0	0	0	0	31
05:00	0	43	17	0	0	0	0	1	0	0	0	0	0	61
06:00	0	146	32	6	2	1	0	1	0	0	0	0	0	188
07:00	5	259	69	**7**	8	0	**3**	4	0	0	0	0	0	355
08:00	6	**263**	67	3	**16**	1	2	4	**3**	0	0	0	0	**365**
09:00	4	195	68	7	12	1	3	8	1	0	0	0	0	299
10:00	**11**	210	58	4	13	**4**	0	7	0	0	0	0	0	307
11:00	7	243	**79**	7	6	2	0	**11**	0	0	0	0	0	355
12 PM	10	263	70	2	9	1	**5**	4	1	**1**	0	0	0	366
13:00	2	247	65	**4**	5	**3**	1	5	**2**	0	0	0	0	334
14:00	12	294	70	4	**12**	1	3	**12**	2	1	0	0	0	411
15:00	8	287	**96**	1	7	1	5	9	1	0	0	0	0	415
16:00	**20**	344	79	1	8	1	3	9	0	1	0	0	0	466
17:00	17	**365**	67	0	7	0	2	12	0	0	0	0	0	**470**
18:00	8	271	52	1	3	0	0	5	0	0	0	0	0	340
19:00	4	186	40	1	4	0	0	3	0	0	0	0	0	238
20:00	0	132	20	0	0	0	2	1	0	0	0	0	0	155
21:00	0	63	13	0	1	0	0	1	1	0	0	0	0	79
22:00	1	45	3	0	0	0	0	0	0	0	0	0	0	49
23:00	0	30	2	0	0	0	0	0	0	0	0	0	0	32
Day Total	115	3955	982	49	113	18	30	97	13	3	0	0	0	5375
Percent	2.1%	73.6%	18.3%	0.9%	2.1%	0.3%	0.6%	1.8%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	08:00	11:00	07:00	08:00	10:00	07:00	11:00	08:00					08:00
Vol.	11	263	79	7	16	4	3	11	3					365
PM Peak	16:00	17:00	15:00	13:00	14:00	13:00	12:00	14:00	13:00	12:00				17:00
Vol.	20	365	96	4	12	3	5	12	2	1				470

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/05/18	0	22	0	0	0	0	0	0	0	0	0	0	0	22
01:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
03:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
04:00	0	22	7	0	0	2	0	0	0	0	0	0	0	31
05:00	3	44	13	0	2	1	1	0	0	0	0	0	0	64
06:00	0	130	27	5	6	0	0	0	0	0	0	0	0	168
07:00	**17**	**269**	**84**	**7**	9	0	**5**	**10**	1	0	0	0	0	**402**
08:00	8	229	74	2	**16**	1	1	8	1	0	0	0	0	340
09:00	6	187	62	1	8	**4**	1	2	3	0	0	0	0	274
10:00	6	210	60	0	9	2	2	7	**4**	0	0	0	0	300
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	40	1135	332	15	51	10	10	27	9	0	0	0	0	1629
Percent	2.5%	69.7%	20.4%	0.9%	3.1%	0.6%	0.6%	1.7%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	08:00	09:00	07:00	07:00	10:00					07:00
Vol.	17	269	84	7	16	4	5	10	4					402
PM Peak														
Vol.														
Grand Total	731	23549	5808	205	685	83	158	588	59	8	2	0	0	31876
Percent	2.3%	73.9%	18.2%	0.6%	2.1%	0.3%	0.5%	1.8%	0.2%	0.0%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	7	287	**98**	2	**16**	**2**	**5**	**17**	0	0	**1**	0	0	435
16:00	5	**341**	85	**3**	15	1	1	8	**1**	0	0	0	0	**460**
17:00	**11**	283	56	0	7	0	3	16	1	0	0	0	0	377
18:00	3	210	63	1	7	1	1	5	0	0	0	0	0	291
19:00	3	156	38	0	7	0	2	4	0	0	0	0	0	210
20:00	5	123	24	0	5	0	0	3	1	0	0	0	0	161
21:00	0	78	15	0	1	0	0	1	0	0	0	0	0	95
22:00	0	78	11	0	1	0	0	1	0	0	0	0	0	91
23:00	0	61	9	0	0	0	0	0	0	0	0	0	0	70
Day Total	34	1617	399	6	59	4	12	55	3	0	1	0	0	2190
Percent	1.6%	73.8%	18.2%	0.3%	2.7%	0.2%	0.5%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	17:00 11	16:00 341	15:00 98	16:00 3	15:00 16	15:00 2	15:00 5	15:00 17	16:00 1		15:00 1			16:00 460

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	20	5	0	0	0	0	0	0	0	0	0	0	25
01:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
04:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
05:00	0	17	17	1	1	0	1	0	0	0	0	0	0	37
06:00	1	21	8	0	0	0	0	0	0	0	0	0	0	30
07:00	0	48	8	0	3	1	2	0	0	0	0	0	0	62
08:00	2	105	35	0	6	0	1	2	0	0	0	0	0	151
09:00	5	154	53	1	7	**3**	1	1	0	0	0	0	0	225
10:00	**7**	**204**	61	**2**	4	0	**3**	**4**	0	0	0	0	0	**285**
11:00	6	185	**72**	0	**8**	1	1	2	0	0	0	0	0	275
12 PM	1	158	45	0	**7**	0	0	2	0	0	0	0	0	213
13:00	**8**	161	**52**	0	3	0	1	**9**	0	0	0	0	0	234
14:00	3	164	46	0	3	0	0	1	0	0	0	0	0	217
15:00	5	156	21	0	2	0	0	3	0	0	0	0	0	187
16:00	6	**177**	49	0	2	0	**2**	5	0	0	0	0	0	**241**
17:00	5	169	31	0	7	0	1	4	0	0	0	0	0	217
18:00	6	162	42	0	1	0	0	3	0	0	0	0	0	214
19:00	6	142	32	0	0	0	0	2	0	0	0	0	0	182
20:00	3	103	17	0	3	0	0	0	0	0	0	0	0	126
21:00	0	70	11	0	1	0	0	0	0	0	0	0	0	82
22:00	0	66	13	0	2	0	0	0	0	0	0	0	0	81
23:00	0	45	9	0	1	0	1	0	0	0	0	0	0	56
Day Total	64	2377	637	4	61	5	14	38	0	0	0	0	0	3200
Percent	2.0%	74.3%	19.9%	0.1%	1.9%	0.2%	0.4%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	10:00	11:00	09:00	10:00	10:00						10:00
Vol.	7	204	72	2	8	3	3	4						285
PM Peak	13:00	16:00	13:00		12:00		16:00	13:00						16:00
Vol.	8	177	52		7		2	9						241

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	25	2	0	0	0	0	0	0	0	0	0	0	27
01:00	0	17	6	0	0	0	0	0	0	0	0	0	0	23
02:00	0	17	3	0	0	0	0	0	0	0	0	0	0	20
03:00	0	18	1	0	1	0	0	0	0	0	0	0	0	20
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	7	3	0	1	0	0	0	0	0	0	0	0	11
06:00	0	15	4	0	0	0	0	0	0	0	0	0	0	19
07:00	0	32	12	0	**5**	0	0	0	0	0	0	0	0	49
08:00	1	64	17	0	1	0	0	1	0	0	0	0	0	84
09:00	1	126	**33**	0	2	**1**	0	1	0	0	0	0	0	164
10:00	**6**	**153**	31	0	2	0	0	**2**	0	0	0	0	0	**194**
11:00	6	145	33	0	2	0	**2**	2	0	0	0	0	0	190
12 PM	2	177	33	0	2	0	**2**	3	0	0	0	0	0	219
13:00	**13**	183	42	0	5	0	0	3	0	0	0	0	0	**246**
14:00	2	170	36	0	5	**1**	0	2	0	0	0	0	0	216
15:00	7	**185**	28	0	5	0	0	2	0	0	0	0	0	227
16:00	9	156	40	0	**9**	0	0	**4**	0	0	0	0	0	218
17:00	4	157	**47**	**1**	2	0	0	2	0	0	0	0	0	213
18:00	5	152	25	1	2	0	2	1	0	0	0	0	0	188
19:00	3	135	33	0	2	0	0	0	0	0	0	0	0	173
20:00	3	88	20	0	3	0	0	2	0	0	0	0	0	116
21:00	0	61	7	0	2	0	0	0	0	0	0	0	0	70
22:00	3	38	7	0	1	0	0	0	0	0	0	0	0	49
23:00	0	24	4	0	1	0	0	0	0	0	0	0	0	29
Day Total	65	2150	468	2	53	2	6	25	0	0	0	0	0	2771
Percent	2.3%	77.6%	16.9%	0.1%	1.9%	0.1%	0.2%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	09:00		07:00	09:00	11:00	10:00						10:00
Vol.	6	153	33		5	1	2	2						194
PM Peak	13:00	15:00	17:00	17:00	16:00	14:00	12:00	16:00						13:00
Vol.	13	185	47	1	9	1	2	4						246

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	1	15	0	0	0	0	0	0	0	0	0	0	0	16
01:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
02:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
03:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
04:00	0	3	3	0	0	0	0	0	0	0	0	0	0	6
05:00	1	24	14	1	4	0	0	0	0	0	0	0	0	44
06:00	2	127	58	2	10	3	6	2	0	**1**	0	0	0	211
07:00	**18**	**280**	**81**	**4**	8	1	2	**15**	0	0	0	0	0	**409**
08:00	4	235	76	3	10	1	4	6	1	1	0	0	0	341
09:00	11	160	75	2	10	4	**7**	3	0	0	0	0	0	272
10:00	13	173	51	1	10	**5**	5	2	0	0	0	0	0	260
11:00	8	185	68	4	**17**	2	4	6	**5**	1	0	0	0	300
12 PM	6	249	83	2	11	**6**	**8**	9	**2**	**2**	0	0	0	378
13:00	5	274	67	1	**18**	5	6	6	1	0	0	0	0	383
14:00	**20**	230	87	**4**	17	3	5	**15**	0	1	0	0	0	382
15:00	17	289	**100**	3	13	3	2	12	1	0	0	0	0	**440**
16:00	10	300	91	1	11	2	2	15	0	0	0	0	0	432
17:00	7	**308**	70	0	12	0	7	12	0	0	0	0	0	416
18:00	10	211	45	0	6	1	1	4	0	0	0	0	0	278
19:00	1	195	42	0	5	0	3	2	0	0	0	0	0	248
20:00	3	140	20	0	4	0	0	4	0	0	0	0	0	171
21:00	2	60	5	0	3	0	0	1	0	0	0	0	0	71
22:00	0	41	3	0	1	0	0	0	0	0	0	0	0	45
23:00	1	33	8	0	0	0	0	0	0	0	0	0	0	42
Day Total	140	3566	1051	28	170	36	62	114	10	6	0	0	0	5183
Percent	2.7%	68.8%	20.3%	0.5%	3.3%	0.7%	1.2%	2.2%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	11:00	10:00	09:00	07:00	11:00	06:00				07:00
Vol.	18	280	81	4	17	5	7	15	5	1				409
PM Peak	14:00	17:00	15:00	14:00	13:00	12:00	12:00	14:00	12:00	12:00				15:00
Vol.	20	308	100	4	18	6	8	15	2	2				440

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	15	2	0	0	0	0	0	0	0	0	0	0	17
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
03:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
04:00	0	6	4	0	1	0	0	0	1	0	0	0	0	12
05:00	0	27	14	1	4	0	3	1	1	0	0	0	0	51
06:00	1	137	59	1	12	1	1	0	0	**2**	0	0	0	214
07:00	**16**	**285**	**73**	**5**	13	3	**8**	**15**	1	2	0	0	0	**421**
08:00	8	232	71	3	15	**4**	2	5	**2**	1	0	0	0	343
09:00	9	135	54	1	11	2	3	2	0	1	0	0	0	218
10:00	4	178	63	4	13	3	3	4	1	2	0	**1**	0	276
11:00	3	194	48	5	**16**	2	2	6	1	0	0	0	0	277
12 PM	8	234	74	0	14	**3**	**14**	10	1	1	0	0	0	359
13:00	8	204	82	2	12	2	1	3	0	**2**	0	0	0	316
14:00	7	201	83	**4**	**23**	2	2	6	**2**	0	0	0	0	330
15:00	**10**	315	**95**	3	17	1	5	12	1	0	0	0	0	459
16:00	8	**357**	89	0	14	0	4	12	0	0	0	0	0	**484**
17:00	10	337	86	0	16	0	4	**13**	0	0	0	0	0	466
18:00	2	237	62	0	7	0	0	7	0	0	0	0	0	315
19:00	5	181	50	0	3	0	0	5	0	0	0	0	0	244
20:00	3	117	23	0	4	0	1	2	0	0	0	0	0	150
21:00	0	62	12	0	1	0	0	0	0	0	0	0	0	75
22:00	0	33	9	0	1	0	0	0	0	0	0	0	0	43
23:00	1	28	6	0	0	0	0	1	0	0	0	0	0	36
Day Total	103	3536	1062	29	197	23	53	104	11	11	0	1	0	5130
Percent	2.0%	68.9%	20.7%	0.6%	3.8%	0.4%	1.0%	2.0%	0.2%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	11:00	08:00	07:00	07:00	08:00	06:00		10:00		07:00
Vol.	16	285	73	5	16	4	8	15	2	2		1		421
PM Peak	15:00	16:00	15:00	14:00	14:00	12:00	12:00	17:00	14:00	13:00				16:00
Vol.	10	357	95	4	23	3	14	13	2	2				484

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	21	1	0	0	0	0	0	0	0	0	0	0	22
01:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
02:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
03:00	0	6	5	0	0	0	0	0	0	0	0	0	0	11
04:00	0	7	4	0	0	0	0	0	0	0	0	0	0	11
05:00	2	24	16	0	2	3	0	0	0	0	0	0	0	47
06:00	2	118	51	1	9	3	3	0	0	0	0	0	0	187
07:00	11	**297**	64	3	**14**	2	3	4	0	**1**	0	0	0	**399**
08:00	3	205	56	**4**	12	**4**	**6**	6	**8**	0	0	0	0	304
09:00	6	168	52	0	10	1	4	3	4	0	0	0	0	248
10:00	2	146	**68**	2	9	0	1	6	7	0	0	0	0	241
11:00	**17**	217	60	4	12	1	6	**7**	4	0	**1**	0	0	329
12 PM	5	227	55	1	11	**3**	2	4	3	**1**	0	0	0	312
13:00	13	206	58	**3**	11	3	5	4	**16**	1	0	0	0	320
14:00	9	219	52	1	15	3	2	5	8	0	0	0	0	314
15:00	8	281	91	3	**18**	0	4	7	0	1	0	0	0	413
16:00	**16**	**373**	**98**	0	7	0	**7**	10	0	0	0	0	0	**511**
17:00	9	339	74	0	15	0	3	**14**	0	0	0	0	0	454
18:00	13	288	64	0	6	0	3	11	1	0	0	0	0	386
19:00	3	197	41	0	2	1	1	3	0	0	0	0	0	248
20:00	3	128	29	0	1	0	2	2	0	0	0	0	0	165
21:00	0	74	10	0	2	0	0	0	0	0	0	0	0	86
22:00	0	42	7	0	1	0	0	0	0	0	0	0	0	50
23:00	0	40	10	1	1	0	0	0	0	0	0	0	0	52
Day Total	122	3640	970	23	158	24	52	86	51	4	1	0	0	5131
Percent	2.4%	70.9%	18.9%	0.4%	3.1%	0.5%	1.0%	1.7%	1.0%	0.1%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	10:00	08:00	07:00	08:00	08:00	11:00	08:00	07:00	11:00			07:00
Vol.	17	297	68	4	14	4	6	7	8	1	1			399
PM Peak	16:00	16:00	16:00	13:00	15:00	12:00	16:00	17:00	13:00	12:00				16:00
Vol.	16	373	98	3	18	3	7	14	16	1				511

Tri-State Traffic Data, Inc.

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Street: Greenbag Rd
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Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	10	3	0	0	0	0	0	0	0	0	0	0	13
01:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
02:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
05:00	0	20	16	0	3	1	1	0	0	0	0	0	0	41
06:00	2	121	53	1	8	2	4	0	0	0	0	0	0	191
07:00	15	**309**	61	2	8	0	6	**10**	1	0	0	0	0	**412**
08:00	15	241	60	**6**	13	0	3	8	0	0	0	0	0	346
09:00	3	192	**81**	0	6	1	**7**	2	2	0	0	0	0	294
10:00	**16**	184	56	2	12	2	5	8	1	0	0	0	0	286
11:00	7	217	53	4	**18**	**3**	4	3	**3**	0	0	0	0	312
12 PM	4	273	61	2	9	**3**	4	5	2	0	0	0	0	363
13:00	4	227	49	**5**	14	2	**5**	5	**6**	0	0	0	0	317
14:00	12	212	**78**	5	12	2	4	13	6	**1**	0	0	0	345
15:00	**15**	293	78	3	**20**	1	4	8	6	0	0	0	0	428
16:00	8	326	77	4	14	0	2	**14**	0	1	**1**	0	0	447
17:00	4	**362**	69	2	7	0	2	11	0	0	0	0	0	**457**
18:00	9	247	54	1	2	0	3	5	0	0	0	0	0	321
19:00	4	184	36	0	3	0	0	2	0	0	0	0	0	229
20:00	2	112	20	0	1	0	0	0	0	0	0	0	0	135
21:00	0	70	13	0	1	0	0	1	0	0	0	0	0	85
22:00	0	51	3	0	0	0	0	0	0	0	0	0	0	54
23:00	0	32	6	0	0	0	0	0	0	0	0	0	0	38
Day Total	120	3722	935	37	151	17	54	95	27	2	1	0	0	5161
Percent	2.3%	72.1%	18.1%	0.7%	2.9%	0.3%	1.0%	1.8%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	09:00	08:00	11:00	11:00	09:00	07:00	11:00					07:00
Vol.	16	309	81	6	18	3	7	10	3					412
PM Peak	15:00	17:00	14:00	13:00	15:00	12:00	13:00	16:00	13:00	14:00	16:00			17:00
Vol.	15	362	78	5	20	3	5	14	6	1	1			457

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/05/18	1	14	1	0	0	0	0	0	0	0	0	0	0	16
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	8	3	0	0	0	0	0	1	0	0	0	0	12
04:00	0	11	5	0	2	0	0	0	0	0	0	0	0	18
05:00	1	26	17	0	4	1	4	1	1	0	0	0	0	55
06:00	1	131	47	3	8	1	**8**	1	0	0	0	0	0	200
07:00	**12**	**291**	**66**	2	**9**	0	3	6	2	**1**	0	0	0	**392**
08:00	9	235	56	**6**	6	**4**	4	**11**	3	0	0	0	0	334
09:00	5	171	50	2	7	4	5	5	**9**	0	0	0	0	258
10:00	4	190	55	1	6	3	2	5	4	0	0	0	0	270
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	33	1096	302	14	42	13	26	29	20	1	0	0	0	1576
Percent	2.1%	69.5%	19.2%	0.9%	2.7%	0.8%	1.6%	1.8%	1.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	07:00	08:00	06:00	08:00	09:00	07:00				07:00
Vol.	12	291	66	6	9	4	8	11	9	1				392
PM Peak														
Vol.														
Grand Total	681	21704	5824	143	891	124	279	546	122	24	3	1	0	30342
Percent	2.2%	71.5%	19.2%	0.5%	2.9%	0.4%	0.9%	1.8%	0.4%	0.1%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	2	**46**	318	33	**1**	**1**	0	0	0	0	0	0	0	0	401	39	44
16:00	3	24	381	30	0	0	0	**1**	0	0	0	0	0	0	439	39	43
17:00	**9**	21	**388**	32	1	0	0	0	0	0	0	0	0	0	**451**	39	43
18:00	3	19	238	**37**	0	0	0	0	0	0	0	0	0	0	297	39	45
19:00	6	17	188	16	0	0	0	0	0	0	0	0	0	0	227	39	42
20:00	2	16	163	14	0	0	0	0	0	0	0	0	0	0	195	39	43
21:00	0	3	86	24	0	1	0	0	0	0	0	0	0	0	114	43	48
22:00	0	2	70	7	1	0	0	0	0	0	0	0	0	0	80	39	45
23:00	0	3	40	11	0	0	0	0	0	0	0	0	0	0	54	42	47
Total	25	151	1872	204	3	2	0	1	0	0	0	0	0	0	2258		
Percent	1.1%	6.7%	82.9%	9.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	17:00 9	15:00 46	17:00 388	18:00 37	15:00 1	15:00 1		16:00 1							17:00 451		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	3	23	5	0	0	0	0	0	0	0	0	0	0	31	40	46
01:00	0	0	14	2	**1**	0	0	0	0	0	0	0	0	0	17	42	51
02:00	0	4	10	0	0	0	0	0	0	0	0	0	0	0	14	37	39
03:00	0	1	7	0	0	0	0	0	0	0	0	0	0	0	8	38	39
04:00	0	4	13	6	0	0	0	0	0	0	0	0	0	0	23	44	48
05:00	0	2	13	7	0	0	0	0	0	0	0	0	0	0	22	45	48
06:00	0	2	47	17	1	0	0	0	0	0	0	0	0	0	67	44	48
07:00	0	7	74	24	0	0	0	0	0	0	0	0	0	0	105	43	47
08:00	1	6	106	19	0	0	0	0	0	0	0	0	0	0	132	39	46
09:00	2	5	184	35	0	0	0	0	0	0	0	0	0	0	226	40	46
10:00	3	11	236	26	0	0	0	0	0	0	0	0	0	0	276	39	44
11:00	**4**	**18**	**256**	**48**	1	0	0	0	0	0	0	0	0	0	**327**	39	46
12 PM	1	14	**230**	36	0	0	0	0	0	0	0	0	0	0	**281**	39	46
13:00	1	11	182	31	0	0	0	0	0	0	0	0	0	0	225	39	46
14:00	**2**	18	189	**38**	**1**	0	0	0	0	0	0	0	0	0	248	40	47
15:00	1	6	195	29	0	0	0	0	0	0	**1**	0	0	0	232	39	46
16:00	0	**23**	221	28	1	0	0	0	0	0	0	0	0	0	273	39	45
17:00	1	9	193	24	0	0	0	0	0	0	0	0	0	0	227	39	45
18:00	0	16	163	22	0	0	0	0	0	0	0	0	0	0	201	39	45
19:00	0	14	128	17	1	0	0	0	0	0	0	0	0	0	160	39	45
20:00	0	8	91	19	0	0	0	0	0	0	0	0	0	0	118	40	46
21:00	0	5	70	12	0	0	0	0	0	0	0	0	0	0	87	39	46
22:00	0	4	44	5	0	0	0	0	0	0	0	0	0	0	53	39	44
23:00	0	3	35	11	1	0	0	0	0	0	0	0	0	0	50	44	48
Total	16	194	2724	461	7	0	0	0	0	0	1	0	0	0	3403		
Percent	0.5%	5.7%	80.0%	13.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	01:00										11:00		
Vol.	4	18	256	48	1										327		
PM Peak	14:00	16:00	12:00	14:00	14:00						15:00				12:00		
Vol.	2	23	230	38	1						1				281		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	0	2	34	2	0	0	0	0	0	0	0	0	0	0	38	38	40
01:00	0	1	14	1	0	0	0	0	0	0	0	0	0	0	16	39	42
02:00	0	2	8	1	0	0	0	0	0	0	0	0	0	0	11	39	44
03:00	0	1	7	2	**1**	0	0	0	0	0	0	0	0	0	11	46	54
04:00	0	0	7	1	0	0	0	0	0	0	0	0	0	0	8	39	46
05:00	0	4	9	9	0	0	0	0	0	0	0	0	0	0	22	46	48
06:00	0	1	26	9	0	0	0	0	0	0	0	0	0	0	36	44	48
07:00	0	1	55	10	0	0	0	0	0	0	0	0	0	0	66	40	46
08:00	1	4	71	18	0	0	0	0	0	0	0	0	0	0	94	42	47
09:00	2	5	101	22	1	0	0	0	0	0	0	0	0	0	131	41	47
10:00	1	6	157	25	0	**1**	0	0	0	0	0	0	0	0	190	39	46
11:00	**3**	**15**	**164**	**37**	0	0	0	0	0	0	0	0	0	0	**219**	41	47
12 PM	2	14	**290**	29	0	0	0	0	0	0	0	0	0	0	**335**	39	44
13:00	3	8	226	**43**	0	0	0	0	0	0	0	0	0	0	280	40	46
14:00	1	12	268	40	0	0	0	0	0	0	0	0	0	0	321	39	45
15:00	**4**	7	195	41	**1**	0	0	0	0	0	0	0	0	0	248	41	47
16:00	1	13	202	35	0	0	0	0	0	0	0	0	0	0	251	39	46
17:00	1	10	181	28	0	0	0	0	0	0	0	0	0	0	220	39	46
18:00	0	**15**	148	31	0	0	0	0	0	0	0	0	0	0	194	40	46
19:00	1	10	130	16	0	0	0	0	0	0	0	0	0	0	157	39	45
20:00	4	11	82	14	0	0	0	0	0	0	0	0	0	0	111	39	46
21:00	0	4	65	13	0	0	0	0	0	0	0	0	0	0	82	40	46
22:00	0	4	27	7	0	0	0	0	0	0	0	0	0	0	38	41	47
23:00	0	0	20	7	0	0	0	0	0	0	0	0	0	0	27	44	48
Total	24	150	2487	441	3	1	0	0	0	0	0	0	0	0	3106		
Percent	0.8%	4.8%	80.1%	14.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	03:00	10:00									11:00		
Vol.	3	15	164	37	1	1									219		
PM Peak	15:00	18:00	12:00	13:00	15:00										12:00		
Vol.	4	15	290	43	1										335		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	1	8	1	0	0	0	0	0	0	0	0	0	0	10	39	45
01:00	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7	38	39
02:00	0	1	4	1	0	0	0	0	0	0	0	0	0	0	6	40	46
03:00	0	0	7	1	0	0	0	0	0	0	0	0	0	0	8	39	46
04:00	0	1	16	12	0	0	0	0	0	0	0	0	0	0	29	46	48
05:00	0	5	54	13	0	0	0	0	0	0	0	0	0	0	72	41	47
06:00	3	14	123	29	0	0	0	0	0	0	0	0	0	0	169	41	47
07:00	2	19	320	34	0	0	0	0	0	0	0	0	0	0	375	39	44
08:00	3	38	**322**	31	**1**	0	**1**	0	0	0	0	0	0	0	**396**	39	44
09:00	3	23	205	25	0	0	0	0	0	0	0	0	0	0	256	39	44
10:00	**5**	24	205	25	0	0	0	0	0	0	**1**	0	0	0	260	39	45
11:00	4	**42**	251	**36**	0	0	0	0	0	0	0	0	0	0	333	39	45
12 PM	**13**	35	320	22	0	0	0	0	0	0	0	0	0	0	390	38	41
13:00	3	20	244	40	0	0	0	0	0	0	0	0	0	0	307	39	46
14:00	6	38	347	36	**2**	**1**	0	0	0	0	0	0	0	0	430	39	44
15:00	4	35	380	35	0	0	**1**	0	0	0	0	0	0	0	455	39	43
16:00	3	**52**	340	34	0	1	0	0	0	0	0	**1**	0	0	431	39	44
17:00	4	37	**382**	**41**	0	0	0	0	0	0	0	0	0	0	**464**	39	44
18:00	7	29	239	29	1	0	0	0	0	0	0	0	0	0	305	39	45
19:00	1	23	212	12	0	1	0	0	0	0	0	0	0	0	249	38	40
20:00	0	4	139	22	0	0	0	0	0	0	0	0	0	0	165	39	46
21:00	0	7	67	14	0	0	0	0	0	0	0	0	0	0	88	40	46
22:00	0	2	31	7	0	0	0	0	0	0	0	0	0	0	40	41	47
23:00	0	2	14	5	0	0	0	0	0	0	0	0	0	0	21	43	47
Total	61	452	4237	505	4	3	2	0	0	0	1	1	0	0	5266		
Percent	1.2%	8.6%	80.5%	9.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	08:00	11:00	08:00		08:00				10:00				08:00		
Vol.	5	42	322	36	1		1				1				396		
PM Peak	12:00	16:00	17:00	17:00	14:00	14:00	15:00					16:00			17:00		
Vol.	13	52	382	41	2	1	1					1			464		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	0	2	9	6	0	0	0	0	0	0	0	0	0	0	17	45	48
01:00	0	0	3	2	0	0	0	0	0	0	0	0	0	0	5	46	48
02:00	0	0	6	1	0	0	0	0	0	0	0	0	0	0	7	39	46
03:00	0	1	2	1	0	0	0	0	0	0	0	0	0	0	4	43	47
04:00	0	2	15	9	0	0	0	0	0	0	0	0	0	0	26	45	48
05:00	0	3	51	24	0	0	0	0	0	0	0	0	0	0	78	45	48
06:00	0	20	111	31	0	0	0	0	0	0	0	0	0	0	162	42	47
07:00	5	24	**320**	**35**	0	**1**	0	0	0	0	0	0	0	0	**385**	39	44
08:00	10	41	284	23	**2**	0	0	0	**1**	0	**1**	0	0	0	362	39	43
09:00	**13**	39	233	9	0	0	0	0	0	0	0	0	0	0	294	38	39
10:00	8	**64**	197	16	0	0	0	0	0	0	0	0	0	0	285	38	41
11:00	9	64	265	16	0	0	0	0	0	0	0	0	0	0	354	38	39
12 PM	17	85	239	6	0	0	0	0	**1**	0	0	0	0	0	348	38	39
13:00	**21**	55	260	8	0	0	0	0	0	0	**1**	0	0	0	345	38	39
14:00	11	**106**	274	9	0	0	0	0	0	0	0	0	0	**1**	401	38	39
15:00	11	71	319	14	0	0	0	0	1	0	0	0	0	0	416	38	39
16:00	9	54	335	30	0	**1**	0	0	0	**1**	0	**1**	0	0	431	39	43
17:00	8	44	328	**36**	**1**	0	0	0	1	0	0	0	0	0	418	39	44
18:00	10	27	**384**	34	0	0	0	**2**	0	0	0	0	0	0	**457**	39	43
19:00	1	22	231	24	0	0	0	0	0	0	0	0	0	0	278	39	44
20:00	0	12	131	14	0	0	0	0	0	0	0	0	0	0	157	39	44
21:00	0	6	96	8	0	0	0	0	0	0	0	0	0	0	110	39	43
22:00	0	1	35	11	0	0	0	0	0	0	0	0	0	0	47	43	47
23:00	0	4	23	4	0	0	0	0	0	0	0	0	0	0	31	39	46
Total	133	747	4151	371	3	2	0	2	4	1	2	1	0	1	5418		
Percent	2.5%	13.8%	76.6%	6.8%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	07:00	07:00	08:00	07:00			08:00		08:00				07:00		
Vol.	13	64	320	35	2	1			1		1				385		
PM Peak	13:00	14:00	18:00	17:00	17:00	16:00		18:00	12:00	16:00	13:00	16:00		14:00	18:00		
Vol.	21	106	384	36	1	1		2	1	1	1	1		1	457		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	3	13	4	0	0	0	0	0	0	0	0	0	0	20	42	47
01:00	0	1	6	0	0	0	0	0	0	0	0	0	0	0	7	38	39
02:00	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6	38	39
03:00	0	2	7	1	0	0	0	0	0	0	0	0	0	0	10	39	45
04:00	0	1	15	7	0	0	0	0	0	0	0	0	0	0	23	45	48
05:00	0	4	46	13	0	0	0	0	0	0	0	0	0	0	63	42	47
06:00	0	18	130	25	0	0	0	0	0	0	0	0	0	0	173	39	46
07:00	8	26	327	**39**	0	**1**	0	0	**1**	0	0	0	0	0	**402**	39	45
08:00	**9**	23	**348**	16	0	0	0	0	1	0	0	0	0	0	397	38	39
09:00	2	48	205	9	**1**	0	0	0	0	**1**	0	0	0	0	266	38	39
10:00	7	66	204	10	1	0	0	0	0	0	0	0	0	0	288	38	39
11:00	5	**113**	224	3	0	0	0	0	0	0	0	0	0	0	345	37	39
12 PM	13	59	263	10	0	0	0	0	0	0	0	0	0	0	345	38	39
13:00	**14**	57	205	6	0	0	0	0	0	0	0	0	0	0	282	38	39
14:00	2	**84**	289	7	0	0	0	0	0	0	0	0	0	0	382	38	39
15:00	5	70	330	19	0	0	**1**	0	0	0	0	0	0	0	425	38	39
16:00	13	37	344	40	1	0	0	0	0	0	0	0	0	0	435	39	44
17:00	10	37	**379**	**43**	0	0	0	0	0	0	0	0	0	0	**469**	39	44
18:00	4	20	293	36	0	**1**	0	0	**1**	0	0	0	0	0	355	39	45
19:00	1	17	282	22	0	0	0	0	0	0	0	0	0	0	322	39	42
20:00	0	19	180	22	0	0	0	0	0	0	0	0	0	0	221	39	44
21:00	0	4	83	16	0	0	0	0	0	0	0	0	0	0	103	40	46
22:00	0	1	40	10	**2**	0	0	0	0	0	0	0	0	0	53	44	49
23:00	0	2	27	4	0	0	0	0	0	0	0	0	0	0	33	39	45
Total	93	712	4246	362	5	2	1	0	3	1	0	0	0	0	5425		
Percent	1.7%	13.1%	78.3%	6.7%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	08:00	07:00	09:00	07:00			07:00	09:00					07:00		
Vol.	9	113	348	39	1	1			1	1					402		
PM Peak	13:00	14:00	17:00	17:00	22:00	18:00	15:00		18:00						17:00		
Vol.	14	84	379	43	2	1	1		1						469		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	0	1	20	4	0	0	0	0	0	0	0	0	0	0	25	40	46
01:00	0	0	11	2	0	0	0	0	0	0	0	0	0	0	13	40	46
02:00	0	0	5	4	**1**	0	0	0	0	0	0	0	0	0	10	48	55
03:00	0	2	6	3	0	0	0	0	0	0	0	0	0	0	11	44	48
04:00	0	0	18	13	0	0	0	0	0	0	0	0	0	0	31	46	48
05:00	0	1	43	17	0	0	0	0	0	0	0	0	0	0	61	44	48
06:00	0	17	137	34	0	0	0	0	0	0	0	0	0	0	188	41	47
07:00	2	**36**	278	**38**	0	0	**1**	0	0	0	0	0	0	0	355	39	45
08:00	15	30	**290**	30	0	0	0	0	0	0	0	0	0	0	**365**	39	43
09:00	9	35	235	20	0	0	0	0	0	0	0	0	0	0	299	38	42
10:00	**17**	17	246	27	0	0	0	0	0	0	0	0	0	0	307	39	44
11:00	17	33	290	14	0	0	0	0	**1**	0	0	0	0	0	355	38	39
12 PM	11	58	278	17	**1**	0	**1**	0	0	0	0	0	0	0	366	38	40
13:00	9	58	249	19	0	0	0	0	0	0	0	0	0	0	335	38	41
14:00	11	**63**	310	26	1	0	0	0	0	0	0	0	0	0	411	38	42
15:00	8	31	345	31	1	0	0	0	0	0	0	0	0	0	416	39	43
16:00	**19**	43	**379**	25	0	0	0	0	0	0	0	0	0	0	466	38	40
17:00	18	55	364	**33**	0	0	0	0	0	0	0	0	0	0	**470**	38	42
18:00	3	42	270	23	0	0	1	0	0	**1**	0	0	0	0	340	39	43
19:00	3	58	170	6	1	0	0	0	0	0	0	0	0	0	238	38	39
20:00	0	50	102	3	0	0	0	0	0	0	0	0	0	0	155	38	39
21:00	0	12	64	3	0	0	0	0	0	0	0	0	0	0	79	38	39
22:00	0	2	44	3	0	0	0	0	0	0	0	0	0	0	49	39	41
23:00	0	1	29	2	0	0	0	0	0	0	0	0	0	0	32	39	42
Total	142	645	4183	397	5	0	3	0	1	1	0	0	0	0	5377		
Percent	2.6%	12.0%	77.8%	7.4%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	08:00	07:00	02:00		07:00		11:00						08:00		
Vol.	17	36	290	38	1		1		1						365		
PM Peak	16:00	14:00	16:00	17:00	12:00		12:00			18:00					17:00		
Vol.	19	63	379	33	1		1			1					470		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

WB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/05/18	1	3	18	0	0	0	0	0	0	0	0	0	0	0	22	38	39
01:00	0	0	10	1	0	0	0	0	0	0	0	0	0	0	11	39	44
02:00	0	0	4	1	0	0	0	0	0	0	0	0	0	0	5	42	47
03:00	0	2	6	4	0	0	0	0	0	0	0	0	0	0	12	45	48
04:00	0	0	22	9	0	0	0	0	0	0	0	0	0	0	31	44	48
05:00	0	2	45	16	1	0	0	0	0	0	0	0	0	0	64	44	48
06:00	0	9	114	**44**	0	0	0	0	0	0	0	0	**1**	0	168	44	48
07:00	12	40	**320**	27	**2**	0	**1**	0	0	0	0	0	0	0	**402**	39	43
08:00	5	**47**	259	27	0	**1**	0	**1**	0	0	0	0	0	0	340	39	44
09:00	6	19	229	19	1	0	0	0	0	0	0	0	0	0	274	39	43
10:00	**18**	35	228	18	1	0	0	0	0	0	0	0	0	0	300	38	42
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	42	157	1255	166	5	1	1	1	0	0	0	0	1	0	1629		
Percent	2.6%	9.6%	77.0%	10.2%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%			
AM Peak	10:00	08:00	07:00	06:00	07:00	08:00	07:00	08:00					06:00		07:00		
Vol.	18	47	320	44	2	1	1	1					1		402		
PM Peak Vol.																	
Total	536	3208	25155	2907	35	11	7	4	8	3	4	2	1	1	31882		
Percent	1.7%	10.1%	78.9%	9.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	30 MPH
	50th Percentile :	34 MPH
	85th Percentile :	39 MPH
	95th Percentile :	44 MPH
Stats	10 MPH Pace Speed :	31-40 MPH
	Number in Pace :	25175
	Percent in Pace :	79.0%
	Number of Vehicles > 55 MPH :	59
	Percent of Vehicles > 55 MPH :	0.2%
	Mean Speed(Average) :	35 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	4	20	364	**44**	**2**	0	0	**1**	0	0	0	0	0	0	435	39	45
16:00	4	27	**385**	44	0	0	0	0	0	0	0	0	0	0	**460**	39	44
17:00	**10**	**28**	295	44	0	0	0	0	0	0	0	0	0	0	377	39	45
18:00	4	20	240	25	0	0	0	1	0	0	**1**	0	0	0	291	39	44
19:00	2	7	179	22	0	0	0	0	0	0	0	0	0	0	210	39	45
20:00	1	13	133	13	1	0	0	0	0	0	0	0	0	0	161	39	44
21:00	2	11	68	14	0	0	0	0	0	0	0	0	0	0	95	39	46
22:00	1	9	63	18	0	0	0	0	0	0	0	0	0	0	91	42	47
23:00	0	2	56	12	0	0	0	0	0	0	0	0	0	0	70	41	47
Total	28	137	1783	236	3	0	0	2	0	0	1	0	0	0	2190		
Percent	1.3%	6.3%	81.4%	10.8%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	17:00 10	17:00 28	16:00 385	15:00 44	15:00 2			15:00 1			18:00 1				16:00 460		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	0	19	6	0	0	0	0	0	0	0	0	0	0	25	43	47
01:00	1	0	12	3	0	0	0	0	0	0	0	0	0	0	16	42	47
02:00	0	1	6	2	0	0	0	0	0	0	0	0	0	0	9	43	47
03:00	0	1	12	3	0	0	0	0	0	0	0	0	0	0	16	42	47
04:00	1	2	11	5	0	0	0	0	0	0	0	0	0	0	19	44	48
05:00	0	6	26	5	0	0	0	0	0	0	0	0	0	0	37	39	46
06:00	0	1	23	6	0	0	0	0	0	0	0	0	0	0	30	42	47
07:00	0	3	48	11	0	0	0	0	0	0	0	0	0	0	62	41	47
08:00	0	6	117	27	**1**	0	0	0	0	0	0	0	0	0	151	41	47
09:00	0	**13**	179	**32**	0	0	0	0	0	0	**1**	0	0	0	225	39	46
10:00	**4**	5	**244**	32	0	0	0	0	0	0	0	0	0	0	**285**	39	45
11:00	0	5	237	31	0	**1**	0	0	**1**	0	0	0	0	0	275	39	46
12 PM	0	7	173	33	0	0	0	0	0	0	0	0	0	0	213	40	46
13:00	**6**	8	184	35	1	0	0	0	0	0	0	0	0	0	234	40	46
14:00	0	4	182	30	1	0	0	0	0	0	0	0	0	0	217	39	46
15:00	3	**10**	153	19	**2**	0	0	0	0	0	0	0	0	0	187	39	46
16:00	1	9	**191**	**39**	0	0	**1**	0	0	0	0	0	0	0	**241**	40	47
17:00	0	10	180	25	1	**1**	0	0	0	0	0	0	0	0	217	39	46
18:00	0	4	182	26	2	0	0	0	0	0	0	0	0	0	214	39	46
19:00	2	7	152	21	0	0	0	0	0	0	0	0	0	0	182	39	45
20:00	0	6	102	18	0	0	0	0	0	0	0	0	0	0	126	39	46
21:00	0	1	76	5	0	0	0	0	0	0	0	0	0	0	82	39	41
22:00	0	5	61	15	0	0	0	0	0	0	0	0	0	0	81	41	47
23:00	0	2	49	5	0	0	0	0	0	0	0	0	0	0	56	39	44
Total	18	116	2619	434	8	2	1	0	1	0	1	0	0	0	3200		
Percent	0.6%	3.6%	81.8%	13.6%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	10:00	09:00	08:00	11:00			11:00		09:00				10:00		
Vol.	4	13	244	32	1	1			1		1				285		
PM Peak	13:00	15:00	16:00	16:00	15:00	17:00	16:00								16:00		
Vol.	6	10	191	39	2	1	1								241		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	0	3	20	4	0	0	0	0	0	0	0	0	0	0	27	39	46
01:00	0	0	17	6	0	0	0	0	0	0	0	0	0	0	23	44	48
02:00	0	2	11	7	0	0	0	0	0	0	0	0	0	0	20	45	48
03:00	0	0	15	5	0	0	0	0	0	0	0	0	0	0	20	44	48
04:00	0	0	5	1	0	0	0	0	0	0	0	0	0	0	6	40	46
05:00	0	1	6	4	0	0	0	0	0	0	0	0	0	0	11	45	48
06:00	0	0	14	5	0	0	0	0	0	0	0	0	0	0	19	44	48
07:00	0	6	38	5	0	0	0	0	0	0	0	0	0	0	49	39	45
08:00	1	1	61	20	**1**	0	0	0	0	0	0	0	0	0	84	44	48
09:00	1	5	124	**33**	1	0	0	0	0	0	0	0	0	0	164	42	47
10:00	**2**	**9**	**160**	23	0	0	0	0	0	0	0	0	0	0	**194**	39	45
11:00	1	8	158	23	0	0	0	0	0	0	0	0	0	0	190	39	45
12 PM	**7**	4	184	24	0	0	0	0	0	0	0	0	0	0	219	39	45
13:00	5	3	**206**	30	1	0	0	0	0	0	0	0	0	**1**	**246**	39	46
14:00	0	5	190	21	0	0	0	0	0	0	0	0	0	0	216	39	44
15:00	1	3	187	**35**	1	0	0	0	0	0	0	0	0	0	227	40	47
16:00	3	5	178	32	0	0	0	0	0	0	0	0	0	0	218	39	46
17:00	1	7	185	20	0	0	0	0	0	0	0	0	0	0	213	39	44
18:00	1	7	156	23	0	0	0	**1**	0	0	0	0	0	0	188	39	46
19:00	0	**8**	140	24	1	0	0	0	0	0	0	0	0	0	173	39	46
20:00	0	7	91	16	**2**	0	0	0	0	0	0	0	0	0	116	40	47
21:00	1	2	54	13	0	0	0	0	0	0	0	0	0	0	70	41	47
22:00	3	3	37	6	0	0	0	0	0	0	0	0	0	0	49	39	45
23:00	0	1	24	4	0	0	0	0	0	0	0	0	0	0	29	39	46
Total	27	90	2261	384	7	0	0	1	0	0	0	0	0	1	2771		
Percent	1.0%	3.2%	81.6%	13.9%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	09:00	08:00										10:00		
Vol.	2	9	160	33	1										194		
PM Peak	12:00	19:00	13:00	15:00	20:00			18:00						13:00	13:00		
Vol.	7	8	206	35	2			1						1	246		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	1	14	1	0	0	0	0	0	0	0	0	0	0	16	39	42
01:00	1	3	10	1	0	0	0	0	0	0	0	0	0	0	15	38	42
02:00	0	0	11	1	0	0	0	0	0	0	0	0	0	0	12	39	44
03:00	0	1	10	0	0	0	0	0	0	0	0	0	0	0	11	38	39
04:00	0	0	4	2	0	0	0	0	0	0	0	0	0	0	6	45	48
05:00	0	0	30	14	0	0	0	0	0	0	0	0	0	0	44	45	48
06:00	0	16	176	17	**1**	**1**	0	0	0	0	0	0	0	0	211	39	44
07:00	**10**	25	**343**	**30**	0	0	**1**	0	0	0	0	0	0	0	**409**	39	43
08:00	1	**38**	272	28	0	0	0	**2**	0	0	0	0	0	0	341	39	44
09:00	7	28	208	28	0	0	0	0	0	**1**	0	0	0	0	272	39	45
10:00	4	23	204	27	1	0	0	0	**1**	0	0	0	0	0	260	39	45
11:00	3	31	254	11	0	0	0	1	0	0	0	0	0	0	300	38	39
12 PM	1	**50**	311	15	0	**1**	0	0	0	0	0	0	0	0	378	38	39
13:00	2	39	317	25	0	0	0	0	0	0	0	0	0	0	383	38	42
14:00	6	30	320	25	0	0	0	0	0	**1**	0	0	0	0	382	39	42
15:00	**11**	34	**363**	31	0	0	0	**1**	0	0	0	0	0	0	**440**	39	43
16:00	6	30	360	**35**	0	1	0	0	0	0	0	0	0	0	432	39	44
17:00	3	26	359	28	0	0	0	0	0	0	0	0	0	0	416	39	42
18:00	2	21	225	29	0	1	0	0	0	0	0	0	0	0	278	39	45
19:00	2	10	214	22	0	0	0	0	0	0	0	0	0	0	248	39	44
20:00	2	12	137	18	**1**	0	0	0	0	0	0	**1**	0	0	171	39	46
21:00	1	2	63	5	0	0	0	0	0	0	0	0	0	0	71	39	42
22:00	0	3	35	7	0	0	0	0	0	0	0	0	0	0	45	40	46
23:00	0	0	39	3	0	0	0	0	0	0	0	0	0	0	42	39	42
Total	62	423	4279	403	3	4	1	4	1	2	0	1	0	0	5183		
Percent	1.2%	8.2%	82.6%	7.8%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	07:00	07:00	06:00	06:00	07:00	08:00	10:00	09:00					07:00		
Vol.	10	38	343	30	1	1	1	2	1	1					409		
PM Peak	15:00	12:00	15:00	16:00	20:00	12:00		15:00		14:00		20:00			15:00		
Vol.	11	50	363	35	1	1		1		1		1			440		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	0	0	11	6	0	0	0	0	0	0	0	0	0	0	17	45	48
01:00	1	1	3	0	0	0	0	0	0	0	0	0	0	0	5	37	39
02:00	0	3	5	1	0	0	0	0	0	0	0	0	0	0	9	39	45
03:00	0	1	7	2	0	0	0	0	0	0	0	0	0	0	10	42	47
04:00	0	0	8	4	0	0	0	0	0	0	0	0	0	0	12	45	48
05:00	0	3	39	9	0	0	0	0	0	0	0	0	0	0	51	41	47
06:00	0	10	185	18	0	0	0	0	0	0	**1**	0	0	0	214	39	44
07:00	7	23	**371**	**20**	0	0	0	0	0	0	0	0	0	0	**421**	38	39
08:00	**12**	39	275	18	0	0	0	0	0	0	0	0	0	0	344	38	40
09:00	3	21	179	15	0	0	0	0	0	0	0	0	0	0	218	39	42
10:00	6	**51**	203	15	**1**	0	0	0	0	0	0	0	0	0	276	38	41
11:00	3	17	241	16	0	0	0	0	0	0	0	0	0	0	277	38	41
12 PM	10	**54**	281	14	0	0	0	0	0	0	0	0	0	0	359	38	39
13:00	7	26	270	13	0	0	0	0	0	0	0	0	0	0	316	38	39
14:00	5	45	262	17	**1**	0	0	0	0	0	0	0	0	0	330	38	40
15:00	5	47	376	30	0	**1**	0	0	0	0	0	0	0	0	459	38	42
16:00	**13**	33	**410**	27	1	0	0	0	0	0	0	0	0	0	**484**	38	41
17:00	11	27	380	**48**	0	0	0	0	0	0	0	0	0	0	466	39	45
18:00	2	11	275	27	0	0	0	0	0	0	0	0	0	0	315	39	44
19:00	5	9	199	30	0	0	0	0	0	0	0	0	0	**1**	244	39	45
20:00	2	10	119	19	0	0	0	0	0	0	0	0	0	0	150	39	46
21:00	1	2	64	8	0	0	0	0	0	0	0	0	0	0	75	39	45
22:00	0	1	33	9	0	0	0	0	0	0	0	0	0	0	43	42	47
23:00	1	2	30	3	0	0	0	0	0	0	0	0	0	0	36	39	44
Total	94	436	4226	369	3	1	0	0	0	0	1	0	0	1	5131		
Percent	1.8%	8.5%	82.4%	7.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	10:00	07:00	07:00	10:00						06:00				07:00		
Vol.	12	51	371	20	1						1				421		
PM Peak	16:00	12:00	16:00	17:00	14:00	15:00								19:00	16:00		
Vol.	13	54	410	48	1	1								1	484		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	1	19	2	0	0	0	0	0	0	0	0	0	0	22	39	44
01:00	1	0	8	2	0	0	0	0	0	0	0	0	0	0	11	41	47
02:00	0	0	9	1	0	0	0	0	0	0	0	0	0	0	10	39	45
03:00	0	0	11	0	0	0	0	0	0	0	0	0	0	0	11	38	39
04:00	0	0	11	0	0	0	0	0	0	0	0	0	0	0	11	38	39
05:00	0	4	36	7	0	0	0	0	0	0	0	0	0	0	47	39	46
06:00	0	21	155	11	0	0	0	0	0	0	0	0	0	0	187	38	41
07:00	1	17	**338**	**41**	0	0	**1**	0	0	0	**1**	0	0	0	**399**	39	45
08:00	4	**37**	243	19	0	**1**	0	0	0	0	0	0	0	0	304	38	42
09:00	2	13	218	14	**1**	0	0	0	0	0	0	0	0	0	248	38	41
10:00	5	34	183	17	1	0	0	0	0	0	0	**1**	0	0	241	39	44
11:00	**11**	35	264	18	1	0	0	0	0	0	0	0	0	0	329	38	41
12 PM	2	29	263	18	0	0	0	0	0	0	0	0	0	0	312	38	41
13:00	13	**72**	226	6	0	0	1	**1**	0	0	**1**	0	0	0	320	38	39
14:00	1	42	257	13	0	0	1	0	0	0	0	0	0	0	314	38	39
15:00	11	28	354	20	0	0	0	0	0	0	0	0	0	0	413	38	39
16:00	**22**	21	**433**	**33**	**2**	0	0	0	0	0	0	0	0	0	**511**	39	42
17:00	9	22	395	28	0	0	0	0	0	0	0	0	0	0	454	38	41
18:00	5	31	324	23	0	0	**2**	0	0	**1**	0	0	0	0	386	39	42
19:00	2	9	213	23	0	**1**	0	0	0	0	0	0	0	0	248	39	45
20:00	3	6	139	17	0	0	0	0	0	0	0	0	0	0	165	39	45
21:00	0	2	70	14	0	0	0	0	0	0	0	0	0	0	86	40	46
22:00	0	3	41	6	0	0	0	0	0	0	0	0	0	0	50	39	45
23:00	0	7	38	7	0	0	0	0	0	0	0	0	0	0	52	39	46
Total	92	434	4248	340	5	2	5	1	0	1	2	1	0	0	5131		
Percent	1.8%	8.5%	82.8%	6.6%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	07:00	07:00	09:00	08:00	07:00				07:00	10:00			07:00		
Vol.	11	37	338	41	1	1	1				1	1			399		
PM Peak	16:00	13:00	16:00	16:00	16:00	19:00	18:00	13:00		18:00	13:00				16:00		
Vol.	22	72	433	33	2	1	2	1		1	1				511		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	0	0	12	1	0	0	0	0	0	0	0	0	0	0	13	39	43
01:00	1	0	10	0	0	0	0	0	0	0	0	0	0	0	11	38	39
02:00	0	0	9	4	0	0	0	0	0	0	0	0	0	0	13	45	48
03:00	0	1	3	1	0	0	0	0	0	0	0	0	0	0	5	42	47
04:00	0	1	11	6	0	0	0	0	0	0	0	0	0	0	18	45	48
05:00	0	1	30	10	0	0	0	0	0	0	0	0	0	0	41	43	47
06:00	0	15	156	20	0	0	0	0	0	0	0	0	0	0	191	39	45
07:00	8	20	**343**	**41**	0	0	0	0	0	0	0	0	0	0	**412**	39	44
08:00	**12**	37	271	25	**1**	0	0	**1**	0	0	0	0	0	0	347	39	43
09:00	1	21	258	14	0	0	0	0	0	0	0	0	0	0	294	38	39
10:00	9	36	231	9	1	0	0	0	0	0	0	0	0	0	286	38	39
11:00	3	**41**	256	12	0	0	0	0	0	0	0	0	0	0	312	38	39
12 PM	5	45	294	18	0	0	**1**	0	0	0	0	0	0	0	363	38	40
13:00	2	48	255	12	0	0	0	0	0	0	0	0	0	0	317	38	39
14:00	11	**59**	270	5	0	0	0	0	0	0	0	0	0	0	345	38	39
15:00	**15**	36	362	14	0	1	0	0	0	0	0	0	0	0	428	38	39
16:00	13	34	371	**24**	**1**	**2**	0	0	**1**	0	0	0	0	**1**	447	38	42
17:00	5	41	**387**	23	1	0	0	0	0	0	0	0	0	0	**457**	38	40
18:00	5	22	275	17	0	0	0	**1**	1	0	0	0	0	0	321	38	41
19:00	5	34	185	5	0	0	0	0	0	0	0	0	0	0	229	38	39
20:00	1	20	113	1	0	0	0	0	0	0	0	0	0	0	135	38	39
21:00	2	6	71	6	0	0	0	0	0	0	0	0	0	0	85	39	42
22:00	0	4	47	3	0	0	0	0	0	0	0	0	0	0	54	38	40
23:00	0	2	32	3	1	0	0	0	0	0	0	0	0	0	38	39	46
Total	98	524	4252	274	5	3	1	2	2	0	0	0	0	1	5162		
Percent	1.9%	10.2%	82.4%	5.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	07:00	07:00	08:00			08:00							07:00		
Vol.	12	41	343	41	1			1							412		
PM Peak	15:00	14:00	17:00	16:00	16:00	16:00	12:00	18:00	16:00					16:00	17:00		
Vol.	15	59	387	24	1	2	1	1	1					1	457		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: West of Aarons Creek
Weather: Clear
Counter: TSTD

Site Code:
Station ID: WofAaronsCre

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

EB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/05/18	0	1	14	1	0	0	0	0	0	0	0	0	0	0	16	39	42
01:00	1	0	11	2	0	0	0	0	0	0	0	0	0	0	14	39	46
02:00	0	2	3	2	0	0	0	0	0	0	0	0	0	0	7	44	48
03:00	0	1	9	2	0	0	0	0	0	0	0	0	0	0	12	40	46
04:00	0	1	14	3	0	0	0	0	0	0	0	0	0	0	18	40	46
05:00	0	5	45	5	0	0	0	0	0	0	0	0	0	0	55	39	44
06:00	0	18	173	8	0	0	0	0	**1**	0	0	0	0	0	200	38	39
07:00	7	29	**331**	**24**	0	0	0	**1**	0	0	0	0	0	0	**392**	38	42
08:00	**10**	33	277	13	**1**	0	0	0	0	0	0	0	0	0	334	38	39
09:00	4	**47**	197	10	0	0	0	0	0	0	0	0	0	0	258	38	39
10:00	3	38	223	6	0	0	0	0	0	0	0	0	0	0	270	38	39
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	25	175	1297	76	1	0	0	1	1	0	0	0	0	0	1576		
Percent	1.6%	11.1%	82.3%	4.8%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	09:00	07:00	07:00	08:00			07:00	06:00						07:00		
Vol.	10	47	331	24	1			1	1						392		
PM Peak Vol.																	
Total	444	2335	24965	2516	35	12	8	11	5	3	5	2	0	3	30344		
Percent	1.5%	7.7%	82.3%	8.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 30 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 44 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 24982
Percent in Pace : 82.3%
Number of Vehicles > 55 MPH : 67
Percent of Vehicles > 55 MPH : 0.2%
Mean Speed(Average) : 35 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	4	193	96	**4**	24	1	0	**4**	**1**	0	0	0	0	327
16:00	**10**	**256**	**105**	4	**25**	**2**	**4**	4	0	0	0	0	0	**410**
17:00	4	235	66	0	19	1	0	3	1	0	0	0	0	329
18:00	2	175	63	1	22	1	2	2	0	0	0	0	0	268
19:00	1	120	52	0	13	0	1	2	0	0	0	0	0	189
20:00	0	107	31	0	10	0	0	1	0	0	0	0	0	149
21:00	0	55	24	0	3	0	0	0	0	0	0	0	0	82
22:00	0	54	16	0	2	0	0	0	0	0	0	0	0	72
23:00	3	49	12	0	1	0	0	0	0	0	0	0	0	65
Day Total	24	1244	465	9	119	5	7	16	2	0	0	0	0	1891
Percent	1.3%	65.8%	24.6%	0.5%	6.3%	0.3%	0.4%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	16:00 10	16:00 256	16:00 105	15:00 4	16:00 25	16:00 2	16:00 4	15:00 4	15:00 1					16:00 410

Tri-State Traffic Data, Inc.

www.TSTData.com

610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	16	4	0	3	0	0	0	0	0	0	0	0	23
01:00	0	12	8	0	0	0	0	0	0	0	0	0	0	20
02:00	0	5	2	0	0	0	0	1	0	0	0	0	0	8
03:00	0	9	2	0	1	0	0	0	0	0	0	0	0	12
04:00	0	9	7	0	0	0	0	0	0	0	0	0	0	16
05:00	0	11	10	1	5	0	1	0	0	0	0	0	0	28
06:00	1	15	6	0	2	0	0	1	0	0	0	0	0	25
07:00	1	35	9	1	5	0	**2**	0	0	0	0	0	0	53
08:00	2	75	42	0	12	0	1	2	0	0	0	0	0	134
09:00	3	106	52	1	14	1	1	**3**	**1**	0	0	0	0	182
10:00	**6**	**152**	61	**2**	**25**	1	1	3	0	0	0	0	0	**251**
11:00	2	137	**80**	0	20	**2**	0	2	0	0	0	0	0	243
12 PM	2	123	56	0	12	**1**	0	1	**1**	0	0	0	0	196
13:00	7	124	**64**	0	15	0	**1**	**3**	0	0	0	0	0	**214**
14:00	2	95	55	0	14	0	0	2	0	0	0	0	0	168
15:00	4	120	29	0	7	0	1	2	0	0	0	0	0	163
16:00	**11**	**130**	53	0	**17**	0	0	1	0	0	0	0	0	212
17:00	6	124	47	0	13	0	1	1	0	0	0	0	0	192
18:00	3	128	47	0	13	0	0	1	0	0	0	0	0	192
19:00	4	103	43	0	5	1	0	0	0	0	0	0	0	156
20:00	1	69	34	0	7	0	0	0	0	0	0	0	0	111
21:00	0	57	14	0	3	0	0	0	0	0	0	0	0	74
22:00	0	37	18	0	9	0	0	0	0	0	0	0	0	64
23:00	0	34	4	0	9	0	0	0	0	0	0	0	0	47
Day Total	55	1726	747	5	211	6	9	23	2	0	0	0	0	2784
Percent	2.0%	62.0%	26.8%	0.2%	7.6%	0.2%	0.3%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	10:00	10:00	11:00	07:00	09:00	09:00					10:00
Vol.	6	152	80	2	25	2	2	3	1					251
PM Peak	16:00	16:00	13:00		16:00	12:00	13:00	13:00	12:00					13:00
Vol.	11	130	64		17	1	1	3	1					214

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	12	8	0	1	0	0	0	0	0	0	0	0	21
01:00	2	9	6	0	1	0	0	0	0	0	0	0	0	18
02:00	0	12	3	0	1	0	0	0	0	0	0	0	0	16
03:00	0	13	3	0	1	0	0	0	0	0	0	0	0	17
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	6	1	0	1	0	0	0	0	0	0	0	0	8
06:00	0	11	4	0	1	0	0	0	0	0	0	0	0	16
07:00	0	25	8	0	8	0	0	0	0	0	0	0	0	41
08:00	0	46	17	0	3	0	**1**	0	0	0	0	0	0	67
09:00	**3**	87	37	0	10	0	0	**2**	0	0	0	0	0	139
10:00	3	112	41	0	**12**	0	0	1	0	0	0	0	0	**169**
11:00	3	**114**	**43**	0	7	0	0	0	0	0	0	0	0	167
12 PM	3	**143**	42	0	6	**1**	**1**	3	0	0	**1**	0	0	**200**
13:00	2	137	45	0	8	0	0	2	0	0	0	0	0	194
14:00	**8**	128	**46**	0	12	0	0	**5**	0	0	0	0	0	199
15:00	6	142	39	0	11	0	0	0	0	0	0	0	0	198
16:00	4	113	45	0	**19**	0	0	0	0	0	0	0	0	181
17:00	6	127	46	0	18	0	0	0	0	0	0	0	0	197
18:00	5	115	35	**1**	10	0	0	1	0	0	0	0	0	167
19:00	2	104	42	0	11	0	0	0	0	0	0	0	0	159
20:00	3	58	37	0	6	0	0	0	0	0	0	0	0	104
21:00	0	41	11	0	5	0	0	0	0	0	0	0	0	57
22:00	2	26	10	0	5	0	0	0	0	0	0	0	0	43
23:00	0	20	4	0	1	0	0	0	0	0	0	0	0	25
Day Total	52	1604	574	1	158	1	2	14	0	0	1	0	0	2407
Percent	2.2%	66.6%	23.8%	0.0%	6.6%	0.0%	0.1%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00		10:00		08:00	09:00						10:00
Vol.	3	114	43		12		1	2						169
PM Peak	14:00	12:00	14:00	18:00	16:00	12:00	12:00	14:00			12:00			12:00
Vol.	8	143	46	1	19	1	1	5			1			200

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	0	13	1	0	0	0	0	0	0	0	0	0	0	14
01:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
02:00	0	7	2	0	0	0	0	0	1	0	0	0	0	10
03:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
04:00	0	2	1	0	1	0	0	0	0	0	0	0	0	4
05:00	0	17	9	1	9	0	0	0	0	0	0	0	0	36
06:00	3	101	44	1	20	3	5	2	0	**1**	0	0	0	180
07:00	6	**187**	82	5	16	4	5	4	1	0	0	0	0	**310**
08:00	7	174	79	**6**	**29**	2	4	**6**	0	0	0	0	0	307
09:00	7	117	**84**	3	17	2	**8**	5	1	0	0	0	0	244
10:00	**11**	122	59	2	25	**5**	8	3	0	1	0	0	0	236
11:00	8	145	73	5	23	3	6	6	**2**	1	0	0	0	272
12 PM	11	203	83	**4**	**36**	**7**	5	5	1	0	0	**1**	0	356
13:00	4	179	82	2	24	2	**7**	**8**	**2**	0	0	0	0	310
14:00	4	187	80	4	29	3	5	5	1	**1**	0	0	0	319
15:00	10	221	119	4	31	2	2	8	2	0	0	0	0	**399**
16:00	9	221	**122**	4	30	2	0	3	0	0	0	0	0	391
17:00	**14**	**241**	106	0	26	1	0	4	0	0	0	0	0	392
18:00	7	155	67	1	14	1	0	3	0	0	0	0	0	248
19:00	2	129	70	0	16	1	1	1	0	0	0	0	0	220
20:00	0	107	31	0	8	0	0	0	0	0	0	0	0	146
21:00	1	43	14	0	3	0	0	0	0	0	0	0	0	61
22:00	0	31	2	0	3	0	0	0	0	0	0	0	0	36
23:00	3	20	5	0	4	0	0	1	0	0	0	0	0	33
Day Total	107	2638	1220	42	365	38	56	64	11	4	0	1	0	4546
Percent	2.4%	58.0%	26.8%	0.9%	8.0%	0.8%	1.2%	1.4%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	09:00	08:00	08:00	10:00	09:00	08:00	11:00	06:00				07:00
Vol.	11	187	84	6	29	5	8	6	2	1				310
PM Peak	17:00	17:00	16:00	12:00	12:00	12:00	13:00	13:00	13:00	14:00		12:00		15:00
Vol.	14	241	122	4	36	7	7	8	2	1		1		399

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	6	5	0	0	0	0	0	0	0	0	0	0	11
01:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
02:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
03:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
04:00	0	4	5	0	0	0	0	0	**1**	0	0	0	0	10
05:00	0	24	12	1	11	0	3	1	1	0	0	0	0	53
06:00	3	94	50	0	15	2	3	2	0	**2**	0	0	0	171
07:00	6	**188**	85	**6**	24	**6**	**9**	3	0	2	0	0	0	**329**
08:00	7	176	**91**	3	**33**	5	2	0	0	0	0	0	0	317
09:00	4	117	56	2	25	5	8	1	1	0	0	0	0	219
10:00	**9**	135	76	4	25	2	7	**4**	1	2	0	0	0	265
11:00	4	154	64	6	21	3	4	2	1	0	0	0	0	259
12 PM	**9**	180	79	2	24	**4**	**13**	1	**4**	0	0	0	0	316
13:00	3	154	78	1	21	2	4	**10**	3	**3**	0	0	0	279
14:00	6	160	86	**4**	**29**	2	2	8	2	1	0	0	0	300
15:00	5	259	**135**	4	27	2	3	4	0	0	0	0	0	**439**
16:00	0	**261**	119	3	27	0	0	2	0	0	0	0	0	412
17:00	2	253	123	0	27	0	1	4	1	0	0	0	0	411
18:00	2	180	66	1	18	0	4	5	0	0	0	0	0	276
19:00	1	150	48	0	9	1	0	3	0	0	0	0	0	212
20:00	1	93	20	0	11	0	0	3	0	0	0	0	0	128
21:00	1	46	14	0	4	0	0	0	0	0	0	0	0	65
22:00	0	25	10	0	4	0	0	0	0	0	0	0	0	39
23:00	0	23	10	0	2	0	0	0	0	0	0	0	0	35
Day Total	63	2696	1238	37	358	34	63	53	15	10	0	0	0	4567
Percent	1.4%	59.0%	27.1%	0.8%	7.8%	0.7%	1.4%	1.2%	0.3%	0.2%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	08:00	07:00	08:00	07:00	07:00	10:00	04:00	06:00				07:00
Vol.	9	188	91	6	33	6	9	4	1	2				329
PM Peak	12:00	16:00	15:00	14:00	14:00	12:00	12:00	13:00	12:00	13:00				15:00
Vol.	9	261	135	4	29	4	13	10	4	3				439

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	11	4	0	0	0	0	0	0	0	0	0	0	15
01:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	4	6	0	0	0	0	0	0	0	0	0	0	10
04:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
05:00	2	23	9	0	6	3	0	0	0	0	0	0	0	43
06:00	2	87	50	0	11	2	4	1	0	0	0	0	0	157
07:00	**7**	**208**	**81**	4	22	3	0	1	4	0	0	0	0	**330**
08:00	5	157	68	**5**	**30**	**6**	**6**	3	**5**	0	0	0	0	285
09:00	4	122	57	2	15	2	4	0	5	0	0	0	0	211
10:00	4	118	72	2	24	1	2	4	5	0	0	0	0	232
11:00	4	178	76	2	20	4	3	**6**	4	0	0	0	0	297
12 PM	5	189	69	0	24	**5**	**6**	2	5	0	0	0	0	305
13:00	12	157	67	**6**	26	2	4	**4**	**12**	**1**	0	0	0	291
14:00	3	161	72	2	17	1	5	4	8	1	0	0	0	274
15:00	6	197	102	4	**32**	2	3	1	1	0	0	0	0	348
16:00	**13**	**268**	**126**	3	28	1	1	4	0	0	0	0	0	**444**
17:00	4	258	107	1	32	0	2	4	0	0	0	0	0	408
18:00	1	234	77	1	23	1	1	0	1	0	0	0	0	339
19:00	2	153	61	1	13	0	1	3	0	0	0	0	0	234
20:00	2	105	37	0	10	0	0	0	0	0	0	0	0	154
21:00	2	58	13	0	6	0	0	0	0	0	0	0	0	79
22:00	0	36	10	0	2	0	0	0	0	0	0	0	0	48
23:00	0	29	9	1	3	0	0	0	0	0	0	0	0	42
Day Total	78	2769	1179	34	344	33	42	37	50	2	0	0	0	4568
Percent	1.7%	60.6%	25.8%	0.7%	7.5%	0.7%	0.9%	0.8%	1.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	08:00	08:00	08:00	11:00	08:00					07:00
Vol.	7	208	81	5	30	6	6	6	5					330
PM Peak	16:00	16:00	16:00	13:00	15:00	12:00	12:00	13:00	13:00	13:00				16:00
Vol.	13	268	126	6	32	5	6	4	12	1				444

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	10	7	0	0	0	0	0	0	0	0	0	0	17
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	10	4	0	1	0	0	0	0	0	0	0	0	15
05:00	0	19	8	0	6	1	1	0	0	0	0	0	0	35
06:00	2	92	32	0	16	2	3	0	0	0	0	0	0	147
07:00	3	**195**	**84**	4	22	0	4	2	0	0	0	0	0	**314**
08:00	**5**	174	77	**6**	**41**	2	0	**4**	2	0	0	0	0	311
09:00	4	131	78	0	25	2	**6**	3	**3**	0	0	0	0	252
10:00	4	144	70	2	30	2	2	2	1	0	0	0	0	257
11:00	5	156	79	6	26	**3**	2	3	3	0	0	0	0	283
12 PM	5	203	88	1	20	3	3	4	1	0	0	0	0	328
13:00	4	161	70	2	20	3	4	5	4	0	0	0	0	273
14:00	**6**	171	106	1	29	**5**	**5**	**6**	**6**	**1**	0	0	0	336
15:00	3	251	112	3	**39**	0	3	4	6	1	0	0	0	**422**
16:00	5	226	**113**	**5**	34	0	0	4	0	0	0	0	0	387
17:00	2	**261**	109	0	29	1	1	2	2	0	0	0	0	407
18:00	4	181	75	0	18	1	0	2	0	0	0	0	0	281
19:00	4	138	35	0	12	0	1	5	0	0	0	0	0	195
20:00	4	82	34	0	3	0	0	0	0	0	0	0	0	123
21:00	0	47	25	0	3	0	0	0	0	0	0	0	0	75
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	60	2670	1211	30	374	25	35	46	28	2	0	0	0	4481
Percent	1.3%	59.6%	27.0%	0.7%	8.3%	0.6%	0.8%	1.0%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	08:00	08:00	11:00	09:00	08:00	09:00					07:00
Vol.	5	195	84	6	41	3	6	4	3					314
PM Peak	14:00	17:00	16:00	16:00	15:00	14:00	14:00	14:00	14:00	14:00				15:00
Vol.	6	261	113	5	39	5	5	6	6	1				422
Grand Total	439	15347	6634	158	1929	142	214	253	108	18	1	1	0	25244
Percent	1.7%	60.8%	26.3%	0.6%	7.6%	0.6%	0.8%	1.0%	0.4%	0.1%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	3	237	62	**1**	8	0	**3**	6	**1**	0	0	0	0	321
16:00	**16**	262	**77**	1	**10**	0	0	**7**	1	0	0	0	0	**374**
17:00	11	**291**	58	0	6	0	1	4	0	0	0	0	0	371
18:00	2	208	40	0	5	0	0	1	0	0	0	0	0	256
19:00	0	148	33	0	4	0	0	4	0	0	0	0	0	189
20:00	0	138	28	0	4	0	0	0	1	0	0	0	0	171
21:00	0	83	14	0	0	0	0	0	0	0	0	0	0	97
22:00	0	64	14	0	2	0	1	0	0	0	0	0	0	81
23:00	0	42	9	0	1	0	0	0	0	0	0	0	0	52
Day Total	32	1473	335	2	40	0	5	22	3	0	0	0	0	1912
Percent	1.7%	77.0%	17.5%	0.1%	2.1%	0.0%	0.3%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.														
PM Peak Vol.	16:00 16	17:00 291	16:00 77	15:00 1	16:00 10		15:00 3	16:00 7	15:00 1					16:00 374

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/29/18	0	21	2	0	0	0	0	0	0	0	0	0	0	23
01:00	0	14	0	0	0	0	0	0	0	0	0	0	0	14
02:00	2	8	2	0	0	0	0	0	0	0	0	0	0	12
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	9	7	0	0	0	0	0	0	0	0	0	0	16
05:00	0	12	9	0	0	0	0	0	0	0	0	0	0	21
06:00	1	44	10	0	2	0	0	0	0	0	0	0	0	57
07:00	1	61	29	0	0	0	0	0	0	0	0	0	0	91
08:00	1	86	23	0	3	**1**	0	0	0	**1**	0	0	0	115
09:00	6	147	**47**	**2**	8	0	**1**	2	0	0	0	0	0	213
10:00	3	178	39	0	**10**	0	0	3	0	0	0	0	0	233
11:00	**8**	**227**	42	0	7	1	0	**4**	0	0	0	0	0	**289**
12 PM	5	179	**51**	0	4	**1**	**1**	**3**	0	0	0	0	0	**244**
13:00	**8**	153	40	**1**	0	1	0	1	0	0	0	0	0	204
14:00	4	177	42	0	**5**	0	0	0	0	0	0	0	0	228
15:00	6	162	31	0	3	1	0	3	0	0	0	0	0	206
16:00	6	**182**	44	0	1	1	0	2	0	0	0	0	0	236
17:00	2	164	31	0	2	0	0	2	0	0	0	0	0	201
18:00	2	154	31	0	3	0	0	0	0	0	0	0	0	190
19:00	0	134	19	0	1	1	0	0	0	0	0	0	0	155
20:00	2	92	19	0	0	0	0	0	0	0	0	0	0	113
21:00	0	56	12	0	1	0	0	0	0	0	0	0	0	69
22:00	0	38	8	0	1	0	0	0	0	0	0	0	0	47
23:00	1	41	2	0	0	1	0	0	0	0	0	0	0	45
Day Total	58	2344	540	3	51	8	2	20	0	1	0	0	0	3027
Percent	1.9%	77.4%	17.8%	0.1%	1.7%	0.3%	0.1%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	09:00	10:00	08:00	09:00	11:00		08:00				11:00
Vol.	8	227	47	2	10	1	1	4		1				289
PM Peak	13:00	16:00	12:00	13:00	14:00	12:00	12:00	12:00						12:00
Vol.	8	182	51	1	5	1	1	3						244

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
09/30/18	0	22	4	0	2	0	0	1	0	0	0	0	0	29
01:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	8	1	0	1	0	0	0	0	0	0	0	0	10
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
05:00	0	13	5	0	1	0	0	0	0	0	0	0	0	19
06:00	0	28	6	0	1	0	0	0	0	0	0	0	0	35
07:00	1	39	12	0	1	0	0	0	0	0	0	0	0	53
08:00	1	63	13	0	0	0	0	0	0	0	0	0	0	77
09:00	3	99	18	0	3	0	0	0	0	0	0	0	0	123
10:00	3	127	**36**	0	0	0	0	**3**	0	0	0	0	0	169
11:00	**4**	**145**	33	0	**4**	0	0	2	0	0	0	0	0	**188**
12 PM	7	224	**56**	0	3	0	1	**5**	0	0	0	0	0	**296**
13:00	**17**	196	47	0	**5**	**1**	1	5	0	0	0	0	0	272
14:00	7	**227**	47	0	3	1	**2**	3	0	0	0	0	0	290
15:00	9	180	38	0	4	1	0	2	0	**1**	0	0	0	235
16:00	3	156	40	0	4	0	0	1	0	0	0	0	0	204
17:00	5	164	31	0	4	0	0	2	0	0	0	0	0	206
18:00	4	150	21	**1**	2	1	0	1	0	0	0	0	0	180
19:00	2	97	22	0	5	1	0	2	0	0	0	0	0	129
20:00	0	73	13	0	2	0	0	2	0	0	0	0	0	90
21:00	0	61	9	0	1	0	0	0	0	0	0	0	0	71
22:00	1	29	4	0	1	0	0	0	0	0	0	0	0	35
23:00	0	19	3	0	0	1	0	0	0	0	0	0	0	23
Day Total	67	2139	463	1	47	6	4	29	0	1	0	0	0	2757
Percent	2.4%	77.6%	16.8%	0.0%	1.7%	0.2%	0.1%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		11:00			10:00						11:00
Vol.	4	145	36		4			3						188
PM Peak	13:00	14:00	12:00	18:00	13:00	13:00	14:00	12:00		15:00				12:00
Vol.	17	227	56	1	5	1	2	5		1				296

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/01/18	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	3	1	1	1	0	0	0	0	0	0	0	0	6
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
03:00	0	4	0	0	0	0	0	0	1	0	0	0	0	5
04:00	0	16	5	0	0	1	0	0	0	0	0	0	0	22
05:00	0	47	14	0	1	1	0	0	0	0	0	0	0	63
06:00	2	100	33	4	5	0	0	1	0	0	0	0	0	145
07:00	**10**	230	**90**	**6**	11	2	**1**	2	0	**1**	0	0	0	353
08:00	9	230	82	6	**14**	1	1	**10**	**2**	0	0	0	0	**355**
09:00	1	155	53	1	8	**6**	0	2	0	0	0	0	0	226
10:00	1	174	67	0	9	1	0	4	1	0	0	0	0	257
11:00	3	**241**	57	4	13	1	1	6	1	0	0	0	0	327
12 PM	5	226	73	2	11	0	**4**	5	**1**	**1**	0	0	0	328
13:00	**14**	203	53	4	19	2	2	5	0	0	0	0	0	302
14:00	6	264	83	**10**	**24**	**3**	1	6	1	1	0	0	0	**399**
15:00	8	285	**85**	1	14	0	0	2	1	1	0	0	0	397
16:00	6	283	62	2	8	0	1	3	0	0	0	0	0	365
17:00	7	**296**	57	0	6	3	0	2	0	0	0	0	0	371
18:00	6	222	33	0	6	0	2	**7**	1	0	0	0	0	277
19:00	1	168	42	0	7	1	0	2	0	0	0	0	0	221
20:00	0	124	19	0	3	0	0	1	0	0	0	0	0	147
21:00	0	58	8	0	3	0	0	0	0	0	0	0	0	69
22:00	0	29	5	0	2	0	0	0	0	0	0	0	0	36
23:00	0	16	2	0	0	1	0	0	0	0	0	0	0	19
Day Total	79	3386	924	41	165	23	13	58	9	4	0	0	0	4702
Percent	1.7%	72.0%	19.7%	0.9%	3.5%	0.5%	0.3%	1.2%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	11:00	07:00	07:00	08:00	09:00	07:00	08:00	08:00	07:00				08:00
Vol.	10	241	90	6	14	6	1	10	2	1				355
PM Peak	13:00	17:00	15:00	14:00	14:00	14:00	12:00	18:00	12:00	12:00				14:00
Vol.	14	296	85	10	24	3	4	7	1	1				399

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/02/18	0	11	2	0	0	0	0	0	0	0	0	0	0	13
01:00	0	4	1	0	1	0	0	0	0	0	0	0	0	6
02:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	11	6	0	0	1	0	1	0	0	0	0	0	19
05:00	0	44	15	0	1	1	0	0	1	0	0	0	0	62
06:00	2	108	34	5	8	0	0	0	0	0	0	0	0	157
07:00	5	**238**	77	**7**	15	2	1	2	1	0	0	0	0	**348**
08:00	5	227	78	4	**17**	**4**	1	2	1	0	0	0	0	339
09:00	0	164	65	1	10	2	**2**	**4**	1	0	0	0	0	249
10:00	5	169	59	1	11	4	1	2	**5**	0	0	0	0	257
11:00	**6**	215	**83**	7	17	4	0	1	1	0	0	0	0	334
12 PM	0	224	68	0	13	**3**	1	7	1	0	0	0	0	317
13:00	4	199	55	1	**22**	2	**2**	2	1	0	0	0	0	288
14:00	4	224	65	**11**	20	1	1	4	**4**	0	0	0	0	334
15:00	**9**	234	58	0	16	0	2	1	1	0	0	0	0	321
16:00	8	287	67	2	7	0	1	7	1	0	0	0	0	380
17:00	1	302	60	0	6	0	2	7	0	0	0	0	0	378
18:00	6	**304**	**73**	0	2	0	1	**8**	0	0	0	0	0	**394**
19:00	2	187	49	0	6	0	0	1	0	0	0	0	0	245
20:00	2	118	23	0	5	0	1	0	0	0	0	0	0	149
21:00	0	74	20	0	1	0	0	0	0	0	0	0	0	95
22:00	0	34	3	0	0	0	0	0	0	0	0	0	0	37
23:00	0	20	4	0	0	0	0	0	0	0	0	0	0	24
Day Total	59	3404	966	39	179	24	16	49	18	0	0	0	0	4754
Percent	1.2%	71.6%	20.3%	0.8%	3.8%	0.5%	0.3%	1.0%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	07:00	08:00	08:00	09:00	09:00	10:00					07:00
Vol.	6	238	83	7	17	4	2	4	5					348
PM Peak	15:00	18:00	18:00	14:00	13:00	12:00	13:00	18:00	14:00					18:00
Vol.	9	304	73	11	22	3	2	8	4					394

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/03/18	0	13	2	0	0	0	0	0	0	0	0	0	0	15
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
04:00	0	11	5	0	0	2	0	0	0	0	0	0	0	18
05:00	0	31	12	0	2	1	0	0	1	0	0	0	0	47
06:00	0	120	25	4	4	1	1	3	0	0	0	0	0	158
07:00	**8**	238	**74**	**8**	8	0	0	4	1	0	0	0	0	341
08:00	6	**260**	68	4	**19**	2	1	3	1	0	0	0	0	**364**
09:00	2	175	60	3	12	**3**	**3**	0	**3**	0	0	0	0	261
10:00	6	188	52	0	9	2	1	2	2	0	0	0	0	262
11:00	4	229	70	4	11	2	0	**9**	0	**1**	0	0	0	330
12 PM	3	229	57	1	15	2	0	2	0	0	0	0	0	309
13:00	3	172	44	3	13	2	3	6	2	0	0	0	0	248
14:00	**11**	234	72	**10**	**19**	**4**	0	**8**	**3**	0	0	0	0	361
15:00	9	257	70	1	14	2	0	4	1	0	0	0	0	358
16:00	10	279	**73**	1	8	1	0	7	0	0	0	0	0	379
17:00	5	**320**	63	0	6	0	**5**	7	0	0	0	0	0	**406**
18:00	6	249	52	0	6	0	0	3	0	0	0	0	0	316
19:00	5	204	52	0	8	0	0	0	0	0	0	0	0	269
20:00	1	167	30	0	4	0	0	1	0	0	0	0	0	203
21:00	1	64	20	0	1	1	0	1	0	0	0	0	0	88
22:00	1	36	6	0	0	0	0	0	0	0	0	0	0	43
23:00	0	18	8	0	1	0	0	0	0	0	0	0	0	27
Day Total	81	3504	918	39	160	25	14	60	14	1	0	0	0	4816
Percent	1.7%	72.8%	19.1%	0.8%	3.3%	0.5%	0.3%	1.2%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	07:00	08:00	09:00	09:00	11:00	09:00	11:00				08:00
Vol.	8	260	74	8	19	3	3	9	3	1				364
PM Peak	14:00	17:00	16:00	14:00	14:00	14:00	17:00	14:00	14:00					17:00
Vol.	11	320	73	10	19	4	5	8	3					406

Tri-State Traffic Data, Inc.

www.TSTData.com
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Street: Greenbag Rd
Location: North of Diamon Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Total
10/04/18	0	16	5	0	0	0	0	0	0	0	0	0	0	21
01:00	0	6	0	1	1	0	0	0	0	0	0	0	0	8
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	12	7	0	0	2	0	0	**2**	0	0	0	0	23
05:00	0	38	17	0	0	0	0	0	0	0	0	0	0	55
06:00	2	136	29	6	5	2	0	0	0	0	0	0	0	180
07:00	5	232	**70**	**8**	11	0	1	4	0	0	0	0	0	331
08:00	3	226	66	3	**28**	0	**3**	4	0	0	0	0	0	**333**
09:00	**8**	179	65	6	12	1	1	**6**	1	0	0	0	0	279
10:00	2	194	56	2	15	**4**	2	6	0	0	0	0	0	281
11:00	4	**236**	65	5	13	2	1	5	1	0	0	0	0	332
12 PM	5	230	**77**	2	**19**	1	**1**	**8**	0	0	0	0	0	343
13:00	3	225	59	4	13	1	0	4	**2**	0	0	0	0	311
14:00	3	267	69	**8**	19	**3**	0	5	1	**1**	0	0	0	376
15:00	4	269	76	0	14	0	1	3	0	0	0	0	0	367
16:00	**12**	308	76	1	12	1	0	4	0	1	0	0	0	**415**
17:00	4	**317**	60	0	7	0	0	2	0	0	0	0	0	390
18:00	4	233	46	0	7	0	0	3	0	0	0	0	0	293
19:00	2	176	45	0	4	0	0	2	0	0	0	0	0	229
20:00	0	114	22	0	2	0	0	2	0	0	0	0	0	140
21:00	0	52	12	0	0	0	0	0	1	0	0	0	0	65
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Day Total	61	3479	924	46	182	17	10	58	8	2	0	0	0	4787
Percent	1.3%	72.7%	19.3%	1.0%	3.8%	0.4%	0.2%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	07:00	07:00	08:00	10:00	08:00	09:00	04:00					08:00
Vol.	8	236	70	8	28	4	3	6	2					333
PM Peak	16:00	17:00	12:00	14:00	12:00	14:00	12:00	12:00	13:00	14:00				16:00
Vol.	12	317	77	8	19	3	1	8	2	1				415
Grand Total	437	19729	5070	171	824	103	64	296	52	9	0	0	0	26755
Percent	1.6%	73.7%	18.9%	0.6%	3.1%	0.4%	0.2%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	3	**5**	**49**	219	50	1	0	0	0	0	0	0	0	0	327	50	56
16:00	**6**	2	26	**289**	**85**	2	0	0	0	0	0	0	0	0	**410**	53	57
17:00	2	2	25	215	79	**6**	0	0	0	0	0	0	0	0	329	54	58
18:00	1	1	12	187	65	2	0	0	0	0	0	0	0	0	268	54	58
19:00	2	0	16	139	32	0	0	0	0	0	0	0	0	0	189	51	57
20:00	0	0	21	106	22	0	0	0	0	0	0	0	0	0	149	49	56
21:00	0	3	10	50	17	2	0	0	0	0	0	0	0	0	82	53	58
22:00	1	0	12	47	12	0	0	0	0	0	0	0	0	0	72	51	57
23:00	3	0	6	47	8	1	0	0	0	0	0	0	0	0	65	49	57
Total	18	13	177	1299	370	14	0	0	0	0	0	0	0	0	1891		
Percent	1.0%	0.7%	9.4%	68.7%	19.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	16:00 6	15:00 5	15:00 49	16:00 289	16:00 85	17:00 6									16:00 410		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	0	2	13	8	0	0	0	0	0	0	0	0	0	23	55	58
01:00	1	0	3	9	7	0	0	0	0	0	0	0	0	0	20	55	58
02:00	1	0	0	6	1	0	0	0	0	0	0	0	0	0	8	49	56
03:00	0	0	5	5	1	1	0	0	0	0	0	0	0	0	12	52	64
04:00	0	0	4	9	2	1	0	0	0	0	0	0	0	0	16	53	62
05:00	0	0	6	11	11	0	0	0	0	0	0	0	0	0	28	56	58
06:00	1	0	1	13	7	2	**1**	0	0	0	0	0	0	0	25	58	68
07:00	1	**1**	2	24	22	3	0	0	0	0	0	0	0	0	53	57	61
08:00	3	0	10	78	41	2	0	0	0	0	0	0	0	0	134	55	58
09:00	0	0	19	126	35	2	0	0	0	0	0	0	0	0	182	52	57
10:00	**6**	0	18	**171**	**54**	2	0	0	0	0	0	0	0	0	**251**	53	58
11:00	2	1	**24**	160	53	**4**	0	0	0	0	0	0	0	0	244	53	58
12 PM	4	**2**	14	126	48	2	0	0	0	0	0	0	0	0	196	54	58
13:00	6	1	17	**154**	33	3	0	0	0	0	0	0	0	0	**214**	51	57
14:00	0	0	8	102	53	**4**	**1**	0	0	0	0	0	0	0	168	56	59
15:00	3	0	18	92	45	4	1	0	0	0	0	0	0	0	163	55	59
16:00	**10**	1	16	136	46	3	0	0	0	0	0	0	0	0	212	53	58
17:00	5	0	16	114	**54**	2	0	**1**	0	0	0	0	0	0	192	55	58
18:00	2	0	**26**	110	52	2	0	0	0	0	0	0	0	0	192	54	58
19:00	3	0	19	100	32	2	0	0	0	0	0	0	0	0	156	53	58
20:00	0	0	13	77	21	0	0	0	0	0	0	0	0	0	111	52	57
21:00	0	0	14	51	9	0	0	0	0	0	0	0	0	0	74	49	55
22:00	0	0	7	37	20	0	0	0	0	0	0	0	0	0	64	55	58
23:00	0	0	6	33	8	0	0	0	0	0	0	0	0	0	47	51	57
Total	48	6	268	1757	663	39	3	1	0	0	0	0	0	0	2785		
Percent	1.7%	0.2%	9.6%	63.1%	23.8%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	11:00	10:00	10:00	11:00	06:00								10:00		
Vol.	6	1	24	171	54	4	1								251		
PM Peak	16:00	12:00	18:00	13:00	17:00	14:00	14:00	17:00							13:00		
Vol.	10	2	26	154	54	4	1	1							214		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	1	0	1	16	3	0	0	0	0	0	0	0	0	0	21	49	56
01:00	**2**	0	4	9	2	1	0	0	0	0	0	0	0	0	18	51	61
02:00	0	0	1	8	5	2	0	0	0	0	0	0	0	0	16	59	65
03:00	0	0	3	9	4	1	0	0	0	0	0	0	0	0	17	56	61
04:00	0	0	0	2	2	0	0	0	0	0	0	0	0	0	4	57	59
05:00	0	0	0	5	2	1	0	0	0	0	0	0	0	0	8	58	66
06:00	0	0	1	9	4	2	0	0	0	0	0	0	0	0	16	58	66
07:00	0	0	5	24	12	0	0	0	0	0	0	0	0	0	41	54	58
08:00	0	0	4	34	25	**4**	0	0	0	0	0	0	0	0	67	57	61
09:00	1	0	17	75	44	1	**1**	0	0	0	0	0	0	0	139	55	58
10:00	0	0	**24**	**106**	37	2	0	0	0	0	0	0	0	0	**169**	53	58
11:00	0	0	16	102	**49**	0	0	0	0	0	0	0	0	0	167	54	58
12 PM	2	0	14	**151**	32	1	0	0	0	0	0	0	0	0	**200**	50	57
13:00	0	**1**	9	143	38	2	**1**	0	0	0	0	0	0	0	194	53	58
14:00	**7**	0	7	130	53	2	0	0	0	0	0	0	0	0	199	54	58
15:00	0	0	9	130	56	**3**	0	0	0	0	0	0	0	0	198	55	58
16:00	1	0	4	113	**61**	2	0	0	0	0	0	0	0	0	181	55	58
17:00	2	0	**15**	122	56	2	0	0	0	0	0	0	0	0	197	55	58
18:00	2	0	7	113	43	2	0	0	0	0	0	0	0	0	167	54	58
19:00	2	0	12	107	35	3	0	0	0	0	0	0	0	0	159	54	58
20:00	1	0	7	76	18	2	0	0	0	0	0	0	0	0	104	52	58
21:00	0	0	6	32	17	2	0	0	0	0	0	0	0	0	57	56	59
22:00	4	1	3	25	9	1	0	0	0	0	0	0	0	0	43	53	58
23:00	0	0	2	14	9	0	0	0	0	0	0	0	0	0	25	55	58
Total	25	2	171	1555	616	36	2	0	0	0	0	0	0	0	2407		
Percent	1.0%	0.1%	7.1%	64.6%	25.6%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00		10:00	10:00	11:00	08:00	09:00								10:00		
Vol.	2		24	106	49	4	1								169		
PM Peak	14:00	13:00	17:00	12:00	16:00	15:00	13:00								12:00		
Vol.	7	1	15	151	61	3	1								200		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	0	2	9	2	1	0	0	0	0	0	0	0	0	14	54	63
01:00	1	0	0	8	3	0	0	0	0	0	0	0	0	0	12	54	58
02:00	0	0	0	7	3	0	0	0	0	0	0	0	0	0	10	55	58
03:00	0	1	5	3	1	0	0	0	0	0	0	0	0	0	10	48	55
04:00	0	0	1	1	2	0	0	0	0	0	0	0	0	0	4	57	59
05:00	0	0	2	19	13	2	0	0	0	0	0	0	0	0	36	57	61
06:00	2	1	34	124	19	0	0	0	0	0	0	0	0	0	180	49	55
07:00	3	0	36	206	**63**	1	0	0	0	0	**1**	0	0	0	**310**	52	57
08:00	**5**	**2**	**49**	**211**	36	**4**	0	0	0	0	0	0	0	0	307	49	56
09:00	2	1	26	171	42	2	0	0	0	0	0	0	0	0	244	51	57
10:00	4	0	35	164	31	2	0	0	0	0	0	0	0	0	236	49	56
11:00	4	0	39	194	33	0	0	**1**	0	0	0	**1**	0	0	272	49	56
12 PM	4	0	46	272	34	0	0	0	0	0	0	0	0	0	356	49	54
13:00	5	**1**	42	207	54	1	0	0	0	0	0	0	0	0	310	51	57
14:00	0	0	38	229	52	0	0	0	0	0	0	0	0	0	319	50	56
15:00	7	0	**48**	**286**	57	1	0	0	0	0	0	0	0	0	**399**	49	56
16:00	6	0	11	277	92	**3**	**2**	0	0	0	0	0	0	0	391	54	58
17:00	**12**	0	20	260	**100**	0	0	0	0	0	0	0	0	0	392	54	58
18:00	3	0	15	175	52	3	0	0	0	0	0	0	0	0	248	53	58
19:00	2	0	26	150	42	0	0	0	0	0	0	0	0	0	220	52	57
20:00	0	0	31	101	14	0	0	0	0	0	0	0	0	0	146	49	54
21:00	0	0	6	39	14	2	0	0	0	0	0	0	0	0	61	54	59
22:00	0	0	4	20	11	1	0	0	0	0	0	0	0	0	36	55	59
23:00	3	0	3	23	4	0	0	0	0	0	0	0	0	0	33	49	55
Total	63	6	519	3156	774	23	2	1	0	0	1	1	0	0	4546		
Percent	1.4%	0.1%	11.4%	69.4%	17.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	07:00	08:00		11:00			07:00	11:00			07:00		
Vol.	5	2	49	211	63	4		1			1	1			310		
PM Peak	17:00	13:00	15:00	15:00	17:00	16:00	16:00								15:00		
Vol.	12	1	48	286	100	3	2								399		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	0	0	1	7	2	1	0	0	0	0	0	0	0	0	11	56	64
01:00	1	0	2	4	1	0	0	0	0	0	0	0	0	0	8	49	56
02:00	0	0	1	6	0	0	0	0	0	0	0	0	0	0	7	48	49
03:00	0	0	2	3	1	0	0	0	0	0	0	0	0	0	6	50	56
04:00	0	0	0	5	5	0	0	0	0	0	0	0	0	0	10	57	59
05:00	0	0	8	33	10	2	0	0	0	0	0	0	0	0	53	54	59
06:00	1	1	33	123	13	0	0	0	0	0	0	0	0	0	171	48	53
07:00	3	0	24	**255**	**45**	1	0	0	0	0	**1**	0	0	0	**329**	49	56
08:00	5	0	39	230	43	0	0	0	0	0	0	0	0	0	317	49	56
09:00	3	**5**	43	139	27	1	0	0	0	**1**	0	0	0	0	219	49	56
10:00	**6**	1	**59**	168	27	**4**	0	0	0	0	0	0	0	0	265	49	56
11:00	1	3	22	194	38	1	0	0	0	0	0	0	0	0	259	50	56
12 PM	4	1	58	220	30	1	**1**	**1**	0	0	0	0	0	0	316	49	55
13:00	5	**3**	39	209	22	1	0	0	0	0	0	0	0	0	279	49	54
14:00	**7**	0	46	223	22	2	0	0	0	0	0	0	0	0	300	49	54
15:00	6	3	**67**	307	56	0	0	0	0	0	0	0	0	0	**439**	49	56
16:00	0	3	36	**308**	64	1	0	0	0	0	0	0	0	0	412	50	56
17:00	2	1	39	296	**69**	**3**	0	0	0	0	0	**1**	0	0	411	51	57
18:00	2	0	24	202	45	3	0	0	0	0	0	0	0	0	276	51	57
19:00	1	0	31	151	28	1	0	0	0	0	0	0	0	0	212	49	56
20:00	1	0	16	90	20	1	0	0	0	0	0	0	0	0	128	50	57
21:00	1	0	6	43	13	2	0	0	0	0	0	0	0	0	65	54	59
22:00	0	1	4	23	11	0	0	0	0	0	0	0	0	0	39	54	58
23:00	0	0	5	23	7	0	0	0	0	0	0	0	0	0	35	52	57
Total	49	22	605	3262	599	25	1	1	0	1	1	1	0	0	4567		
Percent	1.1%	0.5%	13.2%	71.4%	13.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	09:00	10:00	07:00	07:00	10:00				09:00	07:00				07:00		
Vol.	6	5	59	255	45	4				1	1				329		
PM Peak	14:00	13:00	15:00	16:00	17:00	17:00	12:00	12:00				17:00			15:00		
Vol.	7	3	67	308	69	3	1	1				1			439		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	0	2	9	4	0	0	0	0	0	0	0	0	0	15	54	58
01:00	1	0	1	7	0	0	0	0	0	0	0	0	0	0	9	48	49
02:00	0	0	1	5	0	0	0	0	0	0	0	0	0	0	6	48	49
03:00	0	0	3	5	2	0	0	0	0	0	0	0	0	0	10	52	57
04:00	0	0	1	5	1	0	0	0	0	0	0	0	0	0	7	49	56
05:00	0	0	5	26	11	**1**	0	0	0	0	0	0	0	0	43	55	58
06:00	0	1	36	105	15	0	0	0	0	0	0	0	0	0	157	49	54
07:00	**5**	1	32	**234**	**58**	0	0	0	0	0	0	0	0	0	**330**	51	57
08:00	3	0	**47**	185	50	0	0	0	0	0	0	0	0	0	285	51	57
09:00	2	0	19	160	28	1	**1**	0	0	0	0	0	0	0	211	49	56
10:00	3	0	43	151	35	0	0	0	0	0	0	0	0	0	232	50	56
11:00	3	**5**	35	210	44	0	0	0	0	0	0	0	0	0	297	49	56
12 PM	2	0	12	244	46	1	0	0	0	0	0	0	0	0	305	50	56
13:00	**9**	**1**	**51**	204	25	0	0	**1**	0	0	0	0	0	0	291	49	54
14:00	1	0	45	185	42	1	0	0	0	0	0	0	0	0	274	50	56
15:00	2	0	35	240	70	0	**1**	0	0	0	0	0	0	0	348	52	57
16:00	8	0	41	**305**	86	**4**	0	0	0	0	0	0	0	0	**444**	52	57
17:00	6	0	14	299	**87**	2	0	0	0	0	0	0	0	0	408	53	57
18:00	0	0	33	257	46	3	0	0	0	0	0	0	0	0	339	49	56
19:00	2	0	23	169	39	1	0	0	0	0	0	0	0	0	234	51	57
20:00	0	0	23	106	23	2	0	0	0	0	0	0	0	0	154	50	57
21:00	0	0	8	56	15	0	0	0	0	0	0	0	0	0	79	52	57
22:00	0	1	7	28	12	0	0	0	0	0	0	0	0	0	48	54	58
23:00	0	0	4	28	7	3	0	0	0	0	0	0	0	0	42	55	62
Total	47	9	521	3223	746	19	2	1	0	0	0	0	0	0	4568		
Percent	1.0%	0.2%	11.4%	70.6%	16.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	08:00	07:00	07:00	05:00	09:00								07:00		
Vol.	5	5	47	234	58	1	1								330		
PM Peak	13:00	13:00	13:00	16:00	17:00	16:00	15:00	13:00							16:00		
Vol.	9	1	51	305	87	4	1	1							444		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

SB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	0	0	2	11	4	0	0	0	0	0	0	0	0	0	17	53	57
01:00	1	0	1	6	0	0	0	0	0	0	0	0	0	0	8	48	49
02:00	0	0	2	6	3	0	0	0	0	0	0	0	0	0	11	54	58
03:00	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4	54	58
04:00	0	0	1	8	5	0	**1**	0	0	0	0	0	0	0	15	57	72
05:00	0	0	1	20	12	1	1	0	0	0	0	0	0	0	35	57	62
06:00	0	**1**	33	88	25	0	0	0	0	0	0	0	0	0	147	51	57
07:00	1	0	17	**232**	**61**	1	1	0	0	0	**1**	0	0	0	**314**	52	57
08:00	**5**	1	**52**	197	53	**2**	0	0	**1**	0	0	0	0	0	311	51	57
09:00	2	1	27	195	26	1	0	0	0	0	0	0	0	0	252	49	55
10:00	1	0	22	202	31	1	0	0	0	0	0	0	0	0	257	49	56
11:00	2	0	33	198	48	2	0	0	0	0	0	0	0	0	283	51	57
12 PM	3	**5**	53	233	34	0	0	0	0	0	0	0	0	0	328	49	55
13:00	1	0	23	208	40	1	0	0	0	0	0	0	0	0	273	50	56
14:00	0	3	61	243	28	1	0	0	0	0	0	0	0	0	336	49	54
15:00	1	0	60	**317**	43	1	0	0	0	0	0	0	0	0	**422**	49	55
16:00	**5**	0	25	279	**77**	0	0	0	**1**	0	0	0	0	0	387	52	57
17:00	3	0	70	278	53	**3**	0	0	0	0	0	0	0	0	407	49	56
18:00	5	0	31	197	45	3	0	0	0	0	0	0	0	0	281	51	57
19:00	2	0	**72**	112	8	0	0	0	0	0	0	0	0	**1**	195	48	49
20:00	2	0	35	81	5	0	0	0	0	0	0	0	0	0	123	48	49
21:00	0	0	11	53	9	2	0	0	0	0	0	0	0	0	75	49	58
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	34	11	632	3167	611	19	3	0	2	0	1	0	0	1	4481		
Percent	0.8%	0.2%	14.1%	70.7%	13.6%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	06:00	08:00	07:00	07:00	08:00	04:00		08:00		07:00				07:00		
Vol.	5	1	52	232	61	2	1		1		1				314		
PM Peak	16:00	12:00	19:00	15:00	16:00	17:00			16:00					19:00	15:00		
Vol.	5	5	72	317	77	3			1					1	422		
Total	284	69	2893	17419	4379	175	13	4	2	1	3	2	0	1	25245		
Percent	1.1%	0.3%	11.5%	69.0%	17.3%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 40 MPH
50th Percentile : 45 MPH
85th Percentile : 51 MPH
95th Percentile : 57 MPH

Stats

10 MPH Pace Speed : 41-50 MPH
Number in Pace : 17428
Percent in Pace : 69.0%
Number of Vehicles > 55 MPH : 2392
Percent of Vehicles > 55 MPH : 9.5%
Mean Speed(Average) : 46 MPH

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/28/18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	4	**15**	69	221	12	0	0	0	0	0	0	0	0	0	321	48	49
16:00	**11**	6	42	295	19	**1**	0	0	0	0	0	0	0	0	**374**	48	50
17:00	2	3	35	**310**	**21**	0	0	0	0	0	0	0	0	0	371	48	51
18:00	0	1	62	182	11	0	0	0	0	0	0	0	0	0	256	48	49
19:00	1	1	64	119	4	0	0	0	0	0	0	0	0	0	189	47	49
20:00	0	3	**76**	91	1	0	0	0	0	0	0	0	0	0	171	47	49
21:00	0	0	28	64	5	0	0	0	0	0	0	0	0	0	97	48	50
22:00	0	1	21	54	5	0	0	0	0	0	0	0	0	0	81	48	51
23:00	0	1	11	39	1	0	0	0	0	0	0	0	0	0	52	48	49
Total	18	31	408	1375	79	1	0	0	0	0	0	0	0	0	1912		
Percent	0.9%	1.6%	21.3%	71.9%	4.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	16:00	15:00	20:00	17:00	17:00	16:00									16:00		
Vol.	11	15	76	310	21	1									374		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/29/18	0	0	7	13	3	0	0	0	0	0	0	0	0	0	23	49	56
01:00	0	0	5	8	1	0	0	0	0	0	0	0	0	0	14	48	53
02:00	2	0	5	4	1	0	0	0	0	0	0	0	0	0	12	48	54
03:00	0	1	4	0	0	0	0	0	0	0	0	0	0	0	5	38	39
04:00	0	0	3	13	0	0	0	0	0	0	0	0	0	0	16	48	49
05:00	0	0	6	14	1	0	0	0	0	0	0	0	0	0	21	48	49
06:00	0	0	14	36	7	0	0	0	0	0	0	0	0	0	57	49	55
07:00	0	1	25	63	2	0	0	0	0	0	0	0	0	0	91	48	49
08:00	1	**2**	33	68	11	0	0	0	0	0	0	0	0	0	115	49	54
09:00	2	2	53	143	12	0	0	0	0	0	**1**	0	0	0	213	48	51
10:00	1	1	53	170	8	0	0	0	0	0	0	0	0	0	233	48	49
11:00	**4**	1	**69**	**200**	**14**	**1**	0	0	0	0	0	0	0	0	**289**	48	50
12 PM	**3**	0	52	**175**	**13**	1	0	0	0	0	0	0	0	0	**244**	48	51
13:00	3	1	45	140	13	1	0	**1**	0	0	0	0	0	0	204	48	53
14:00	0	**3**	47	168	10	0	0	0	0	0	0	0	0	0	228	48	49
15:00	1	1	36	158	10	0	0	0	0	0	0	0	0	0	206	48	49
16:00	2	0	**55**	164	13	**2**	0	0	0	0	0	0	0	0	236	48	52
17:00	1	0	47	143	10	0	0	0	0	0	0	0	0	0	201	48	49
18:00	1	0	46	137	5	1	0	0	0	0	0	0	0	0	190	48	49
19:00	1	0	54	90	10	0	0	0	0	0	0	0	0	0	155	48	52
20:00	2	1	44	63	3	0	0	0	0	0	0	0	0	0	113	47	49
21:00	0	0	23	44	2	0	0	0	0	0	0	0	0	0	69	48	49
22:00	0	0	16	31	0	0	0	0	0	0	0	0	0	0	47	47	49
23:00	1	0	11	31	2	0	0	0	0	0	0	0	0	0	45	48	49
Total	25	14	753	2076	151	6	0	1	0	0	1	0	0	0	3027		
Percent	0.8%	0.5%	24.9%	68.6%	5.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	08:00	11:00	11:00	11:00	11:00					09:00				11:00		
Vol.	4	2	69	200	14	1					1				289		
PM Peak	12:00	14:00	16:00	12:00	12:00	16:00		13:00							12:00		
Vol.	3	3	55	175	13	2		1							244		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
09/30/18	0	1	9	17	2	0	0	0	0	0	0	0	0	0	29	48	52
01:00	0	0	4	7	0	0	0	0	0	0	0	0	0	0	11	47	49
02:00	0	0	1	5	1	0	0	0	0	0	0	0	0	0	7	49	56
03:00	0	0	3	6	1	0	0	0	0	0	0	0	0	0	10	49	55
04:00	0	0	1	4	0	0	0	0	0	0	0	0	0	0	5	48	49
05:00	0	0	7	8	4	0	0	0	0	0	0	0	0	0	19	52	57
06:00	0	0	4	26	5	0	0	0	0	0	0	0	0	0	35	49	56
07:00	0	0	11	35	7	0	0	0	0	0	0	0	0	0	53	49	56
08:00	0	0	9	63	5	0	0	0	0	0	0	0	0	0	77	48	52
09:00	0	0	25	81	**17**	0	0	0	0	0	0	0	0	0	123	49	56
10:00	0	0	42	122	5	0	0	0	0	0	0	0	0	0	169	48	49
11:00	0	**4**	**44**	**136**	4	0	0	0	0	0	0	0	0	0	**188**	48	49
12 PM	1	0	**76**	213	6	0	0	0	0	0	0	0	0	0	**296**	48	49
13:00	**4**	0	48	211	9	0	0	0	0	0	0	0	0	0	272	48	49
14:00	1	0	42	**232**	14	0	**1**	0	0	0	0	0	0	0	290	48	50
15:00	3	**1**	30	181	**20**	0	0	0	0	0	0	0	0	0	235	49	54
16:00	0	0	31	155	18	0	0	0	0	0	0	0	0	0	204	49	54
17:00	0	0	34	162	10	0	0	0	0	0	0	0	0	0	206	48	49
18:00	1	0	25	139	13	**1**	1	0	0	0	0	0	0	0	180	49	54
19:00	1	0	29	95	4	0	0	0	0	0	0	0	0	0	129	48	49
20:00	0	0	30	51	9	0	0	0	0	0	0	0	0	0	90	49	55
21:00	0	0	23	46	2	0	0	0	0	0	0	0	0	0	71	48	49
22:00	0	1	8	23	3	0	0	0	0	0	0	0	0	0	35	49	54
23:00	1	0	9	11	2	0	0	0	0	0	0	0	0	0	23	48	54
Total	12	7	545	2029	161	1	2	0	0	0	0	0	0	0	2757		
Percent	0.4%	0.3%	19.8%	73.6%	5.8%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	11:00	09:00										11:00		
Vol.		4	44	136	17										188		
PM Peak	13:00	15:00	12:00	14:00	15:00	18:00	14:00								12:00		
Vol.	4	1	76	232	20	1	1								296		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/01/18	0	0	3	4	0	0	0	0	0	0	0	0	0	0	7	47	49
01:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	6	47	49
02:00	0	0	2	3	0	0	0	0	0	0	0	0	0	0	5	47	49
03:00	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5	48	49
04:00	0	0	2	17	3	0	0	0	0	0	0	0	0	0	22	49	56
05:00	0	1	13	44	5	0	0	0	0	0	0	0	0	0	63	48	53
06:00	2	**5**	40	94	4	0	0	0	0	0	0	0	0	0	145	48	49
07:00	**5**	1	56	**285**	6	0	0	0	0	0	0	0	0	0	353	48	49
08:00	5	4	92	242	**12**	0	0	0	0	0	0	0	0	0	**355**	48	49
09:00	0	1	68	150	7	0	0	0	0	0	0	0	0	0	226	48	49
10:00	2	1	78	167	9	0	0	0	0	0	0	0	0	0	257	48	49
11:00	1	1	**101**	213	11	0	0	0	0	0	0	0	0	0	327	48	49
12 PM	1	2	85	230	10	0	0	0	0	0	0	0	0	0	328	48	49
13:00	**6**	1	73	212	9	**1**	0	0	0	0	0	0	0	0	302	48	49
14:00	3	0	**106**	277	11	0	**1**	0	**1**	0	0	0	0	0	**399**	48	49
15:00	2	0	86	290	**18**	0	1	0	0	0	0	0	0	0	397	48	49
16:00	1	0	46	**302**	16	0	0	0	0	0	0	0	0	0	365	48	49
17:00	1	**5**	62	288	15	0	0	0	0	0	0	0	0	0	371	48	49
18:00	2	2	51	209	13	0	0	0	0	0	0	0	0	0	277	48	49
19:00	2	1	77	139	2	0	0	0	0	0	0	0	0	0	221	47	49
20:00	0	1	54	91	1	0	0	0	0	0	0	0	0	0	147	47	49
21:00	0	0	24	38	7	0	0	0	0	0	0	0	0	0	69	49	55
22:00	0	0	15	19	2	0	0	0	0	0	0	0	0	0	36	48	51
23:00	1	0	6	11	1	0	0	0	0	0	0	0	0	0	19	48	50
Total	34	26	1143	3333	162	1	2	0	1	0	0	0	0	0	4702		
Percent	0.7%	0.6%	24.3%	70.9%	3.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	06:00	11:00	07:00	08:00										08:00		
Vol.	5	5	101	285	12										355		
PM Peak	13:00	17:00	14:00	16:00	15:00	13:00	14:00		14:00						14:00		
Vol.	6	5	106	302	18	1	1		1						399		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/02/18	0	0	4	9	0	0	0	0	0	0	0	0	0	0	13	47	49
01:00	0	0	1	5	0	0	0	0	0	0	0	0	0	0	6	48	49
02:00	0	0	3	1	0	0	0	0	0	0	0	0	0	0	4	44	48
03:00	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	48	49
04:00	0	0	0	16	3	0	0	0	0	0	0	0	0	0	19	50	56
05:00	0	0	14	40	8	0	0	0	0	0	0	0	0	0	62	49	56
06:00	2	3	37	105	10	0	0	0	0	0	0	0	0	0	157	48	52
07:00	2	0	89	**247**	10	0	0	0	0	0	0	0	0	0	**348**	48	49
08:00	0	0	94	228	**16**	0	0	**1**	0	0	0	0	0	0	339	48	50
09:00	3	0	92	153	1	0	0	0	0	0	0	0	0	0	249	47	49
10:00	**5**	2	**116**	128	5	**1**	0	0	0	0	0	0	0	0	257	47	49
11:00	2	**4**	110	206	11	1	0	0	0	0	0	0	0	0	334	48	49
12 PM	2	2	123	188	2	0	0	0	0	0	0	0	0	0	317	47	49
13:00	4	1	90	189	2	**2**	0	0	0	0	0	0	0	0	288	47	49
14:00	2	5	**127**	191	9	0	0	0	0	0	0	0	0	0	334	47	49
15:00	4	4	105	205	2	0	**1**	0	0	0	0	0	0	0	321	47	49
16:00	**7**	**10**	96	251	16	0	0	0	0	0	0	0	0	0	380	48	49
17:00	2	1	89	272	14	0	0	0	0	0	0	0	0	0	378	48	49
18:00	4	0	75	**296**	**19**	0	0	0	0	0	0	0	0	0	**394**	48	49
19:00	3	0	94	144	3	0	0	0	0	**1**	0	0	0	0	245	47	49
20:00	0	0	51	93	5	0	0	0	0	0	0	0	0	0	149	48	49
21:00	0	0	25	68	2	0	0	0	0	0	0	0	0	0	95	48	49
22:00	0	0	9	25	3	0	0	0	0	0	0	0	0	0	37	48	53
23:00	0	0	14	9	1	0	0	0	0	0	0	0	0	0	24	47	49
Total	42	32	1458	3073	142	4	1	1	0	1	0	0	0	0	4754		
Percent	0.9%	0.7%	30.7%	64.6%	3.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	10:00	07:00	08:00	10:00		08:00							07:00		
Vol.	5	4	116	247	16	1		1							348		
PM Peak	16:00	16:00	14:00	18:00	18:00	13:00	15:00			19:00					18:00		
Vol.	7	10	127	296	19	2	1			1					394		

Tri-State Traffic Data, Inc.

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610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/03/18	0	0	8	6	1	0	0	0	0	0	0	0	0	0	15	47	52
01:00	0	0	2	3	0	0	0	0	0	0	0	0	0	0	5	47	49
02:00	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	38	39
03:00	0	0	2	3	0	0	0	0	0	0	0	0	0	0	5	47	49
04:00	0	0	4	11	3	0	0	0	0	0	0	0	0	0	18	50	56
05:00	0	0	14	30	3	0	0	0	0	0	0	0	0	0	47	48	52
06:00	0	**4**	49	101	4	0	0	0	0	0	0	0	0	0	158	48	49
07:00	**6**	0	78	246	**11**	0	0	0	0	0	0	0	0	0	341	48	49
08:00	4	0	96	**257**	6	0	0	0	**1**	0	0	0	0	0	**364**	48	49
09:00	1	1	109	147	3	0	0	0	0	0	0	0	0	0	261	47	49
10:00	6	1	96	156	3	0	0	0	0	0	0	0	0	0	262	47	49
11:00	3	3	**153**	167	4	0	0	0	0	0	0	0	0	0	330	47	49
12 PM	0	0	130	174	3	**1**	0	0	0	**1**	0	0	0	0	309	47	49
13:00	2	**4**	103	131	7	0	0	0	**1**	0	0	0	0	0	248	47	49
14:00	4	1	**134**	215	7	0	0	0	0	0	0	0	0	0	361	47	49
15:00	**8**	1	108	231	8	1	0	0	0	0	0	0	**1**	0	358	48	49
16:00	7	1	57	274	**38**	1	0	0	1	0	0	0	0	0	379	49	55
17:00	4	0	74	**308**	20	0	0	0	0	0	0	0	0	0	**406**	48	49
18:00	3	0	69	233	11	0	0	0	0	0	0	0	0	0	316	48	49
19:00	4	1	78	178	7	1	0	0	0	0	0	0	0	0	269	48	49
20:00	1	2	87	107	6	0	0	0	0	0	0	0	0	0	203	47	49
21:00	3	1	25	54	5	0	0	0	0	0	0	0	0	0	88	48	51
22:00	0	0	15	25	3	0	0	0	0	0	0	0	0	0	43	48	52
23:00	0	0	9	18	0	0	0	0	0	0	0	0	0	0	27	47	49
Total	56	20	1503	3075	153	4	0	0	3	1	0	0	1	0	4816		
Percent	1.2%	0.4%	31.2%	63.8%	3.2%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	06:00	11:00	08:00	07:00				08:00						08:00		
Vol.	6	4	153	257	11				1						364		
PM Peak	15:00	13:00	14:00	17:00	16:00	12:00			13:00	12:00			15:00		17:00		
Vol.	8	4	134	308	38	1			1	1			1		406		

Tri-State Traffic Data, Inc.

www.TSTData.com
610-466-1469

Street: Greenbag Rd
Location: North of Diamond Ave
Weather: Clear
Counter: TSTD

Site Code:
Station ID: NorthofDiamo

Longitude: 0' 0.0000 Undefined
Latitude: 0' 0.0000 Undefined

NB

Start Time	0 20	21 30	31 40	41 50	51 60	61 70	71 80	81 90	91 100	101 110	111 120	121 130	131 140	141 147	Total	85th Percent	95th Percent
10/04/18	0	1	10	7	3	0	0	0	0	0	0	0	0	0	21	49	56
01:00	0	0	2	4	2	0	0	0	0	0	0	0	0	0	8	53	57
02:00	0	0	1	6	1	0	0	0	0	0	0	0	0	0	8	49	55
03:00	0	0	4	3	0	0	0	0	0	0	0	0	0	0	7	46	48
04:00	0	0	3	16	4	0	0	0	0	0	0	0	0	0	23	51	57
05:00	0	0	12	37	6	0	0	0	0	0	0	0	0	0	55	49	55
06:00	1	2	47	118	12	0	0	0	0	0	0	0	0	0	180	48	52
07:00	3	0	64	**249**	**15**	0	0	0	0	0	0	0	0	0	331	48	49
08:00	3	2	**84**	236	8	0	0	0	0	0	0	0	0	0	**333**	48	49
09:00	**7**	0	67	196	9	0	0	0	0	0	0	0	0	0	279	48	49
10:00	2	1	65	203	8	**1**	0	**1**	0	0	0	0	0	0	281	48	49
11:00	5	**3**	80	233	10	1	0	0	0	0	0	0	0	0	332	48	49
12 PM	4	3	**108**	218	9	0	0	0	**1**	0	0	0	0	0	343	48	49
13:00	2	1	88	208	12	0	0	0	0	0	0	0	0	0	311	48	49
14:00	2	**6**	95	263	10	0	0	0	0	0	0	0	0	0	376	48	49
15:00	2	1	67	280	16	**1**	0	0	0	0	0	0	0	0	367	48	49
16:00	**8**	2	58	**330**	**17**	0	0	0	0	0	0	0	0	0	**415**	48	49
17:00	1	1	61	312	12	1	**1**	0	1	0	0	0	0	0	390	48	49
18:00	2	2	86	194	8	1	0	0	0	0	0	0	0	0	293	48	49
19:00	4	6	97	118	4	0	0	0	0	0	0	0	0	0	229	47	49
20:00	0	3	85	51	1	0	0	0	0	0	0	0	0	0	140	46	48
21:00	0	1	31	29	3	1	0	0	0	0	0	0	0	0	65	48	52
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	46	35	1215	3311	170	6	1	1	2	0	0	0	0	0	4787		
Percent	1.0%	0.7%	25.4%	69.2%	3.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	08:00	07:00	07:00	10:00		10:00							08:00		
Vol.	7	3	84	249	15	1		1							333		
PM Peak	16:00	14:00	12:00	16:00	16:00	15:00	17:00		12:00						16:00		
Vol.	8	6	108	330	17	1	1		1						415		
Total	233	165	7025	18272	1018	23	6	3	6	2	1	0	1	0	26755		
Percent	0.9%	0.6%	26.3%	68.3%	3.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	35 MPH
50th Percentile :	43 MPH
85th Percentile :	48 MPH
95th Percentile :	49 MPH

Stats

10 MPH Pace Speed :	41-50 MPH
Number in Pace :	18280
Percent in Pace :	68.3%
Number of Vehicles > 55 MPH :	551
Percent of Vehicles > 55 MPH :	2.1%
Mean Speed(Average) :	43 MPH

ATR Daily Volume and Vehicle Classification Summary

Location	Direction	Day of Week	Date	Typical Vehicles[(1)]	Total Heavy Vehicles[(2)]	Total Vehicles Per Day	Percent Heavy Vehicles
Greenbag Road, West of Mississippi Avenue	Eastbound	Saturday	9/29/2018	3413	133	3546	3.75%
		Sunday	9/30/2018	2912	120	3032	3.96%
		Monday	10/1/2018	5013	482	5495	8.77%
		Tuesday	10/2/2018	5031	502	5533	9.07%
		Wednesday	10/3/2018	5023	534	5557	9.61%
		Thursday	10/4/2018	4936	607	5543	10.95%
		AVERAGE WEEKDAY	**10/02-04/2018**	**4997**	**548**	**5544**	**9.88%**
		85th Percentile Speed		**44 MPH**			
	Westbound	Saturday	9/29/2018	3205	194	3399	5.71%
		Sunday	9/30/2018	2676	164	2840	5.77%
		Monday	10/1/2018	4985	586	5571	10.52%
		Tuesday	10/2/2018	4844	733	5577	13.14%
		Wednesday	10/3/2018	4788	811	5599	14.48%
		Thursday	10/4/2018	4760	813	5573	14.59%
		AVERAGE WEEKDAY	**10/02-04/2018**	**4797**	**786**	**5583**	**14.08%**
		85th Percentile Speed		**45 MPH**			
Greenbag Road, East of Dorsey Avenue	Eastbound	Saturday	9/29/2018	2905	137	3042	4.50%
		Sunday	9/30/2018	2603	99	2702	3.66%
		Monday	10/1/2018	4428	413	4841	8.53%
		Tuesday	10/2/2018	4384	448	4832	9.27%
		Wednesday	10/3/2018	4524	419	4943	8.48%
		Thursday	10/4/2018	4452	400	4852	8.24%
		Friday	10/5/2018	3471	420	3891	10.79%
		AVERAGE WEEKDAY	**10/02-04/2018**	**4453**	**422**	**4876**	**8.65%**
		85th Percentile Speed		**44 MPH**			
	Westbound	Saturday	9/29/2018	2591	93	2684	3.46%
		Sunday	9/30/2018	2137	54	2191	2.46%
		Monday	10/1/2018	3954	340	4294	7.92%
		Tuesday	10/2/2018	4038	374	4412	8.48%
		Wednesday	10/3/2018	3930	383	4313	8.88%
		Thursday	10/4/2018	3995	352	4347	8.10%
		Friday	10/5/2018	3254	386	3640	10.60%
		AVERAGE WEEKDAY	**10/02-04/2018**	**3988**	**370**	**4357**	**8.49%**
		85th Percentile Speed		**43 MPH**			

ATR Daily Volume and Vehicle Classification Summary

Location	Direction	Day of Week	Date	Typical Vehicles[(1)]	Total Heavy Vehicles[(2)]	Total Vehicles Per Day	Percent Heavy Vehicles
Greenbag Road, West of Dorsey Avenue	Eastbound	Saturday	10/20/2018	3074	293	3367	8.70%
		Sunday	10/21/2018	2598	213	2811	7.58%
		Monday	10/22/2018	4764	651	5415	12.02%
		Tuesday	10/23/2018	4523	634	5157	12.29%
		Wednesday	10/24/2018	4743	655	5398	12.13%
		Thursday	10/25/2018	4709	662	5371	12.33%
		Friday	10/26/2018	4414	613	5027	12.19%
		Saturday	10/27/2018	3297	334	3631	9.20%
		Sunday	10/28/2018	2409	267	2676	9.98%
		Monday	10/29/2018	4662	703	5365	13.10%
		Tuesday	10/30/2018	4712	739	5451	13.56%
		Wednesday	10/31/2018	4734	693	5427	12.77%
		AVERAGE WEEKDAY	**10/23-25 and 30/2018**	**4672**	**673**	**5344**	**12.59%**
		85th Percentile Speed		**48 MPH**			
	Westbound	Saturday	10/20/2018	3203	132	3335	3.96%
		Sunday	10/21/2018	2588	82	2670	3.07%
		Monday	10/22/2018	4878	478	5356	8.92%
		Tuesday	10/23/2018	4783	520	5303	9.81%
		Wednesday	10/24/2018	4694	870	5564	15.64%
		Thursday	10/25/2018	4371	854	5225	16.34%
		Friday	10/26/2018	4322	730	5052	14.45%
		Saturday	10/27/2018	3191	310	3501	8.85%
		Sunday	10/28/2018	2404	210	2614	8.03%
		Monday	10/29/2018	4654	704	5358	13.14%
		Tuesday	10/30/2018	4846	717	5563	12.89%
		Wednesday	10/31/2018	4760	453	5213	8.69%
		AVERAGE WEEKDAY	**10/23-25 and 30/2018**	**4674**	**740**	**5414**	**13.67%**
		85th Percentile Speed		**47 MPH**			
Greenbag Road, West of Aarons Creek Road	Eastbound	Saturday	9/29/2018	3078	122	3200	3.81%
		Sunday	9/30/2018	2683	88	2771	3.18%
		Monday	10/1/2018	4757	426	5183	8.22%
		Tuesday	10/2/2018	4701	429	5130	8.36%
		Wednesday	10/3/2018	4732	399	5131	7.78%
		Thursday	10/4/2018	4777	384	5161	7.44%
		AVERAGE WEEKDAY	**10/02-04/2018**	**4737**	**404**	**5141**	**7.86%**
		85th Percentile Speed		**39 MPH**			
	Westbound	Saturday	9/29/2018	3303	100	3403	2.94%
		Sunday	9/30/2018	3007	99	3106	3.19%
		Monday	10/1/2018	4934	330	5264	6.27%
		Tuesday	10/2/2018	5041	376	5417	6.94%
		Wednesday	10/3/2018	5071	353	5424	6.51%
		Thursday	10/4/2018	5052	323	5375	6.01%
		AVERAGE WEEKDAY	**10/02-04/2018**	**5055**	**351**	**5405**	**6.49%**
		85th Percentile Speed		**39 MPH**			

ATR Daily Volume and Vehicle Classification Summary

Location	Direction	Day of Week	Date	Typical Vehicles[(1)]	Total Heavy Vehicles[(2)]	Total Vehicles Per Day	Percent Heavy Vehicles
Greenbag Road, North of Diamond Avenue	Southbound	Saturday	9/29/2018	2528	256	2784	9.20%
		Sunday	9/30/2018	2230	177	2407	7.35%
		Monday	10/1/2018	3965	581	4546	12.78%
		Tuesday	10/2/2018	3997	570	4567	12.48%
		Wednesday	10/3/2018	4026	542	4568	11.87%
		Thursday	10/4/2018	3941	540	4481	12.05%
		AVERAGE WEEKDAY	**10/02-04/2018**	**3988**	**551**	**4539**	**12.14%**
		85th Percentile Speed		**51 MPH**			
	Northbound	Saturday	9/29/2018	2942	85	3027	2.81%
		Sunday	9/30/2018	2669	88	2757	3.19%
		Monday	10/1/2018	4389	313	4702	6.66%
		Tuesday	10/2/2018	4429	325	4754	6.84%
		Wednesday	10/3/2018	4503	313	4816	6.50%
		Thursday	10/4/2018	4464	323	4787	6.75%
		AVERAGE WEEKDAY	**10/02-04/2018**	**4465**	**320**	**4786**	**6.69%**
		85th Percentile Speed		**39 MPH**			

(1) Typical vehicles inlcude motorcycles, passenger cars, and other two-axle, four-tire, single unit vehicles.
(2) Heavy vehicles includes buses and trucks.

Appendix D. Level of Service Definitions

Intersection Levels of Service (LOS) Definitions

Level of Service A – LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

Level of Service B – LOS B describes operations with control delay between 10 and 20 s/veh and a volume–to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Level of Service C – LOS C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

Level of Service D – LOS D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

Level of Service E – LOS E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

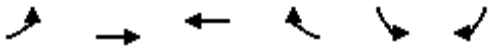
Level of Service F – LOS F describes operations with control delay exceeding 80s/veh when the volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Level of Service Criteria

Level of Service	Signalized Intersections Control Delay (s./veh.)	Unignalized Intersections Control Delay (s./veh.)
A	0 - 10	0 - 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

Source : *Highway Capacity Manual, 2010 Edition.*

Appendix E. 2018 Existing Conditions Intersection Capacity and Queue Analyses



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	109	240	412	163	107	104
Future Volume (vph)	109	240	412	163	107	104
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962		0.933	
Flt Protected		0.985			0.975	
Satd. Flow (prot)	0	1596	1481	0	1426	0
Flt Permitted		0.985			0.975	
Satd. Flow (perm)	0	1596	1481	0	1426	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	127	279	479	190	124	121
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	406	669	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			

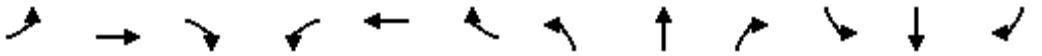
Intersection	
Int Delay, s/veh	21.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	109	240	412	163	107	104
Future Vol, veh/h	109	240	412	163	107	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	127	279	479	190	124	121

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	669	0	-	0	1107	574
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	533	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	907	-	-	-	192	486
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	525	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	907	-	-	-	160	486
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	525	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	109.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	907	-	-	-	239
HCM Lane V/C Ratio	0.14	-	-	-	1.027
HCM Control Delay (s)	9.6	0	-	-	109.7
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	10

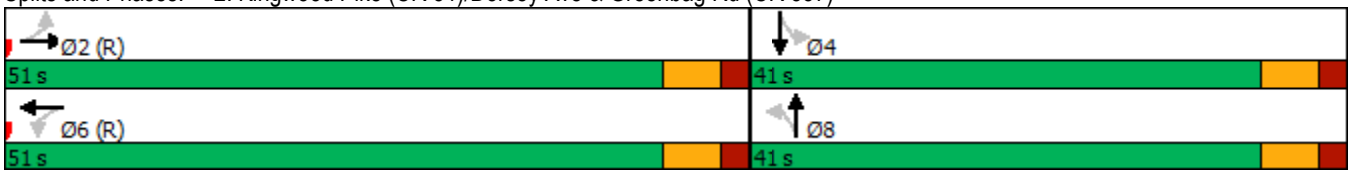


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	273	26	23	353	14	142	149	131	63	19	115
Future Volume (vph)	51	273	26	23	353	14	142	149	131	63	19	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.995			0.958			0.921	
Flt Protected		0.993			0.997			0.983			0.984	
Satd. Flow (prot)	0	1621	0	0	1726	0	0	1711	0	0	1457	0
Flt Permitted		0.889			0.965			0.799			0.745	
Satd. Flow (perm)	0	1451	0	0	1670	0	0	1391	0	0	1103	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			3			28			89	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	55	297	28	25	384	15	154	162	142	68	21	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	380	0	0	424	0	0	458	0	0	214	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.53			0.52			0.84			0.45	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		19.4			18.8			40.1			15.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.4			18.8			40.1			15.6	
LOS		B			B			D			B	
Approach Delay		19.4			18.8			40.1			15.6	
Approach LOS		B			B			D			B	
Queue Length 50th (ft)		144			161			225			50	
Queue Length 95th (ft)		230			246			#403			116	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		712			818			546			474	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.53			0.52			0.84			0.45	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

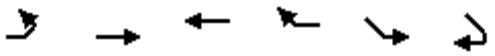
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	273	26	23	353	14	142	149	131	63	19	115
Future Volume (veh/h)	51	273	26	23	353	14	142	149	131	63	19	115
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1706	1843	1919	1800	1919	1966	1947	1966	1834	1723	1834
Adj Flow Rate, veh/h	55	297	28	25	384	15	154	162	142	68	21	125
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	1	1	1	0	0	0
Cap, veh/h	125	625	56	67	799	30	238	231	187	178	69	275
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	163	1278	115	53	1634	62	487	606	492	333	182	724
Grp Volume(v), veh/h	380	0	0	424	0	0	458	0	0	214	0	0
Grp Sat Flow(s),veh/h/ln	1555	0	0	1748	0	0	1585	0	0	1239	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.7	0.0	0.0	14.6	0.0	0.0	23.2	0.0	0.0	11.3	0.0	0.0
Prop In Lane	0.14		0.07	0.06		0.04	0.34		0.31	0.32		0.58
Lane Grp Cap(c), veh/h	806	0	0	896	0	0	655	0	0	523	0	0
V/C Ratio(X)	0.47	0.00	0.00	0.47	0.00	0.00	0.70	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	806	0	0	896	0	0	655	0	0	523	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.5	0.0	0.0	15.7	0.0	0.0	24.8	0.0	0.0	20.8	0.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.0	1.8	0.0	0.0	6.1	0.0	0.0	2.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	0.0	7.6	0.0	0.0	11.2	0.0	0.0	4.4	0.0	0.0
LnGrp Delay(d),s/veh	17.5	0.0	0.0	17.5	0.0	0.0	30.9	0.0	0.0	23.2	0.0	0.0
LnGrp LOS	B			B			C			C		
Approach Vol, veh/h		380			424			458			214	
Approach Delay, s/veh		17.5			17.5			30.9			23.2	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		15.7		13.3		16.6		25.2
Green Ext Time (p_c), s		2.4		1.3		2.6		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	410	390	90	44	0
Future Volume (vph)	0	410	390	90	44	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			
Flt Protected					0.950	
Satd. Flow (prot)	0	1499	1514	0	1386	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1499	1514	0	1386	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	8%	5%	1%	0%	0%
Adj. Flow (vph)	0	488	464	107	52	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	488	571	0	52	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.1%		ICU Level of Service A	
Analysis Period (min) 15			

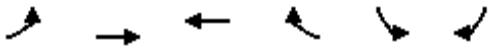
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	410	390	90	44	0
Future Vol, veh/h	0	410	390	90	44	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	8	5	1	0	0
Mvmt Flow	0	488	464	107	52	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	571	0	-	0	1006	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1012	-	-	-	241	546
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1012	-	-	-	241	546
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	24
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1012	-	-	-	241
HCM Lane V/C Ratio	-	-	-	-	0.217
HCM Control Delay (s)	0	-	-	-	24
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	59	395	417	51	34	63
Future Volume (vph)	59	395	417	51	34	63
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.913	
Flt Protected		0.994			0.983	
Satd. Flow (prot)	0	1495	1456	0	1490	0
Flt Permitted		0.994			0.983	
Satd. Flow (perm)	0	1495	1456	0	1490	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	25%	5%	5%	12%	0%	0%
Adj. Flow (vph)	69	459	485	59	40	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	528	544	0	113	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	59	395	417	51	34	63
Future Vol, veh/h	59	395	417	51	34	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	25	5	5	12	0	0
Mvmt Flow	69	459	485	59	40	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	544	0	-	0	1112	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	597	-
Critical Hdwy	4.35	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.425	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	919	-	-	-	264	580
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	919	-	-	-	237	580
Mov Cap-2 Maneuver	-	-	-	-	237	-
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	592	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	18.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	385
HCM Lane V/C Ratio	0.075	-	-	-	0.293
HCM Control Delay (s)	9.2	0	-	-	18.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	444	3	4	399	17	16
Future Volume (vph)	444	3	4	399	17	16
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.934	
Flt Protected				0.999	0.975	
Satd. Flow (prot)	1525	0	0	1594	1414	0
Flt Permitted				0.999	0.975	
Satd. Flow (perm)	1525	0	0	1594	1414	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	4%	0%	0%	3%	0%	0%
Adj. Flow (vph)	548	4	5	493	21	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	552	0	0	498	41	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	444	3	4	399	17	16
Future Vol, veh/h	444	3	4	399	17	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	548	4	5	493	21	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	552	0	1053	550
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	503	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1028	-	301	564
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	665	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1028	-	299	564
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	387	-	-	1028	-
HCM Lane V/C Ratio	0.105	-	-	0.005	-
HCM Control Delay (s)	15.4	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	76	5	402	60	1	330
Future Volume (vph)	76	5	402	60	1	330
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991		0.983			
Flt Protected	0.955					
Satd. Flow (prot)	1557	0	1495	0	0	1542
Flt Permitted	0.955					
Satd. Flow (perm)	1557	0	1495	0	0	1542
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	5%	0%	0%	5%
Adj. Flow (vph)	86	6	457	68	1	375
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	0	525	0	0	376
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.4%		ICU Level of Service A	
Analysis Period (min) 15			

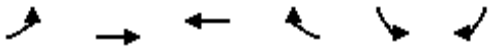
Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	5	402	60	1	330
Future Vol, veh/h	76	5	402	60	1	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	5	0	0	5
Mvmt Flow	86	6	457	68	1	375

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	868	491	0	0	525	0
Stage 1	491	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	671	714	-	-	1052	-
Stage 1	932	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	670	714	-	-	1052	-
Mov Cap-2 Maneuver	670	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	673	1052	-
HCM Lane V/C Ratio	-	-	0.137	0.001	-
HCM Control Delay (s)	-	-	11.2	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	140	497	372	132	41	68
Future Volume (vph)	140	497	372	132	41	68
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965		0.916	
Flt Protected		0.989			0.982	
Satd. Flow (prot)	0	1633	1547	0	1605	0
Flt Permitted		0.989			0.982	
Satd. Flow (perm)	0	1633	1547	0	1605	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	151	534	400	142	44	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	685	542	0	117	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

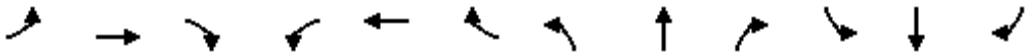
Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	140	497	372	132	41	68
Future Vol, veh/h	140	497	372	132	41	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	151	534	400	142	44	73

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	542	0	-	0	1307	471
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	1032	-	-	-	154	579
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1032	-	-	-	122	579
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	391	-

Approach	EB	WB	SB
HCM Control Delay, s	2	0	33.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1032	-	-	-	240
HCM Lane V/C Ratio	0.146	-	-	-	0.488
HCM Control Delay (s)	9.1	0	-	-	33.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.5	-	-	-	2.5



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	386	110	87	311	22	52	58	50	99	157	107
Future Volume (vph)	108	386	110	87	311	22	52	58	50	99	157	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.993			0.958			0.960	
Flt Protected		0.991			0.990			0.984			0.987	
Satd. Flow (prot)	0	1710	0	0	1810	0	0	1680	0	0	1608	0
Flt Permitted		0.812			0.730			0.775			0.856	
Satd. Flow (perm)	0	1402	0	0	1335	0	0	1323	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			29			26	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	121	434	124	98	349	25	58	65	56	111	176	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	679	0	0	472	0	0	179	0	0	407	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.98			0.72			0.34			0.75	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		53.7			26.1			19.1			33.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		53.7			26.1			19.1			33.1	
LOS		D			C			B			C	
Approach Delay		53.7			26.1			19.1			33.1	
Approach LOS		D			C			B			C	
Queue Length 50th (ft)		364			206			60			189	
Queue Length 95th (ft)		#605			327			112			#303	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		694			655			521			546	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.98			0.72			0.34			0.75	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 37.8		Intersection LOS: D	
Intersection Capacity Utilization 77.4%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

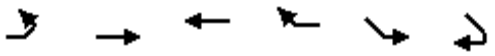
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	386	110	87	311	22	52	58	50	99	157	107
Future Volume (veh/h)	108	386	110	87	311	22	52	58	50	99	157	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1831	1843	1919	1905	1919	1966	1909	1966	1834	1818	1834
Adj Flow Rate, veh/h	121	434	124	98	349	25	58	65	56	111	176	120
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	0	0	0
Cap, veh/h	152	470	129	140	479	32	200	222	168	190	285	178
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	216	962	263	190	979	65	388	583	442	369	748	467
Grp Volume(v), veh/h	679	0	0	472	0	0	179	0	0	407	0	0
Grp Sat Flow(s),veh/h/ln	1441	0	0	1234	0	0	1414	0	0	1584	0	0
Q Serve(g_s), s	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0
Cycle Q Clear(g_c), s	42.3	0.0	0.0	26.7	0.0	0.0	7.4	0.0	0.0	19.1	0.0	0.0
Prop In Lane	0.18		0.18	0.21		0.05	0.32		0.31	0.27		0.29
Lane Grp Cap(c), veh/h	751	0	0	651	0	0	590	0	0	653	0	0
V/C Ratio(X)	0.90	0.00	0.00	0.73	0.00	0.00	0.30	0.00	0.00	0.62	0.00	0.00
Avail Cap(c_a), veh/h	751	0	0	651	0	0	590	0	0	653	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.9	0.0	0.0	17.5	0.0	0.0	19.7	0.0	0.0	23.3	0.0	0.0
Incr Delay (d2), s/veh	16.4	0.0	0.0	6.9	0.0	0.0	1.3	0.0	0.0	4.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	0.0	0.0	10.7	0.0	0.0	3.4	0.0	0.0	9.3	0.0	0.0
LnGrp Delay(d),s/veh	39.3	0.0	0.0	24.4	0.0	0.0	21.0	0.0	0.0	27.8	0.0	0.0
LnGrp LOS	D			C			C			C		
Approach Vol, veh/h		679			472			179			407	
Approach Delay, s/veh		39.3			24.4			21.0			27.8	
Approach LOS		D			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		44.3		21.1		28.7		9.4
Green Ext Time (p_c), s		0.3		2.1		2.8		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.7
HCM 2010 LOS	C



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	423	418	127	55	2
Future Volume (vph)	0	423	418	127	55	2
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969		0.995	
Flt Protected					0.954	
Satd. Flow (prot)	0	1618	1557	0	1385	0
Flt Permitted					0.954	
Satd. Flow (perm)	0	1618	1557	0	1385	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	0	436	431	131	57	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	436	562	0	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

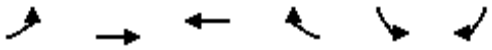
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	423	418	127	55	2
Future Vol, veh/h	0	423	418	127	55	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	436	431	131	57	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	562	0	-	0	933	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	436	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1019	-	-	-	269	561
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	625	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1019	-	-	-	269	561
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	582	-
Stage 2	-	-	-	-	625	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	21.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1019	-	-	-	274
HCM Lane V/C Ratio	-	-	-	-	0.214
HCM Control Delay (s)	0	-	-	-	21.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	465	522	10	19	23
Future Volume (vph)	13	465	522	10	19	23
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.926	
Flt Protected		0.999			0.978	
Satd. Flow (prot)	0	1617	1542	0	1503	0
Flt Permitted		0.999			0.978	
Satd. Flow (perm)	0	1617	1542	0	1503	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	1%	10%	0%	0%
Adj. Flow (vph)	13	474	533	10	19	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	487	543	0	42	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	465	522	10	19	23
Future Vol, veh/h	13	465	522	10	19	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	10	0	0
Mvmt Flow	13	474	533	10	19	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	543	0	-	0	1038	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1036	-	-	-	290	564
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	649	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1036	-	-	-	285	564
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	649	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1036	-	-	-	391
HCM Lane V/C Ratio	0.013	-	-	-	0.11
HCM Control Delay (s)	8.5	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	471	9	31	477	8	12
Future Volume (vph)	471	9	31	477	8	12
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.920	
Flt Protected				0.997	0.980	
Satd. Flow (prot)	1551	0	0	1581	1214	0
Flt Permitted				0.997	0.980	
Satd. Flow (perm)	1551	0	0	1581	1214	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	13%	3%	13%	17%
Adj. Flow (vph)	501	10	33	507	9	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	511	0	0	540	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	471	9	31	477	8	12
Future Vol, veh/h	471	9	31	477	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	13	3	13	17
Mvmt Flow	501	10	33	507	9	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	511	0	1079	506
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	573	-
Critical Hdwy	-	-	4.23	-	5.93	6.07
Critical Hdwy Stg 1	-	-	-	-	4.93	-
Critical Hdwy Stg 2	-	-	-	-	4.93	-
Follow-up Hdwy	-	-	2.317	-	3.617	3.453
Pot Cap-1 Maneuver	-	-	1000	-	276	561
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1000	-	263	561
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	606	-
Stage 2	-	-	-	-	597	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	386	-	-	1000	-
HCM Lane V/C Ratio	0.055	-	-	0.033	-
HCM Control Delay (s)	14.9	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	65	4	371	113	5	439
Future Volume (vph)	65	4	371	113	5	439
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.992		0.968			
Flt Protected	0.955					0.999
Satd. Flow (prot)	1529	0	1501	0	0	1556
Flt Permitted	0.955					0.999
Satd. Flow (perm)	1529	0	1501	0	0	1556
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	3%	0%	0%	4%
Adj. Flow (vph)	68	4	386	118	5	457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	504	0	0	462
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		

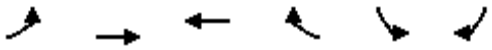
Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	4	371	113	5	439
Future Vol, veh/h	65	4	371	113	5	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	3	0	0	4
Mvmt Flow	68	4	386	118	5	457

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	912	445	0	0	504	0
Stage 1	445	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	3.42	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.42	-	-	-	-	-
Critical Hdwy Stg 2	2.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	650	743	-	-	1071	-
Stage 1	936	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	646	743	-	-	1071	-
Mov Cap-2 Maneuver	646	-	-	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	931	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	651	1071	-
HCM Lane V/C Ratio	-	-	0.11	0.005	-
HCM Control Delay (s)	-	-	11.2	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	345	256	30	21	27
Future Volume (vph)	34	345	256	30	21	27
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986		0.923	
Flt Protected		0.996			0.979	
Satd. Flow (prot)	0	1642	1576	0	1622	0
Flt Permitted		0.996			0.979	
Satd. Flow (perm)	0	1642	1576	0	1622	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%
Adj. Flow (vph)	36	367	272	32	22	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	403	304	0	51	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

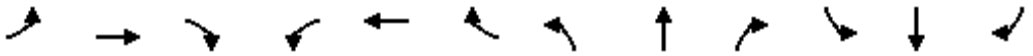
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	345	256	30	21	27
Future Vol, veh/h	34	345	256	30	21	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	1	2	0	0	0
Mvmt Flow	36	367	272	32	22	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	304	0	-	0	727	288
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	439	-
Critical Hdwy	4.13	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1251	-	-	-	363	744
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1251	-	-	-	350	744
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	714	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1251	-	-	-	498
HCM Lane V/C Ratio	0.029	-	-	-	0.103
HCM Control Delay (s)	8	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

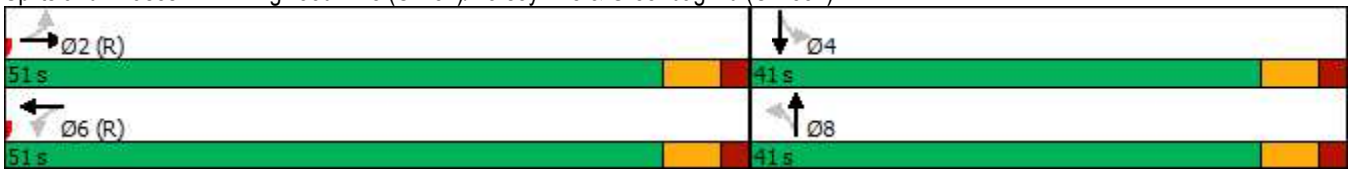


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	239	58	46	189	18	43	42	31	35	47	62
Future Volume (vph)	67	239	58	46	189	18	43	42	31	35	47	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979			0.991			0.964			0.942	
Flt Protected		0.991			0.991			0.982			0.988	
Satd. Flow (prot)	0	1702	0	0	1808	0	0	1737	0	0	1572	0
Flt Permitted		0.893			0.882			0.858			0.912	
Satd. Flow (perm)	0	1534	0	0	1609	0	0	1518	0	0	1451	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			6			23			47	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	68	244	59	47	193	18	44	43	32	36	48	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	371	0	0	258	0	0	119	0	0	147	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.49			0.33			0.20			0.25	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		17.9			15.4			16.4			14.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.9			15.4			16.4			14.4	
LOS		B			B			B			B	
Approach Delay		17.9			15.4			16.4			14.4	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		133			85			36			38	
Queue Length 95th (ft)		212			140			75			82	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		757			790			591			581	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.33			0.20			0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 47.0%		ICU Level of Service A	
Analysis Period (min) 15			

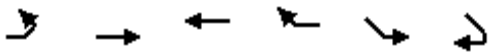
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	239	58	46	189	18	43	42	31	35	47	62
Future Volume (veh/h)	67	239	58	46	189	18	43	42	31	35	47	62
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1815	1843	1919	1905	1919	1966	1966	1966	1834	1810	1834
Adj Flow Rate, veh/h	68	244	59	47	193	18	44	43	32	36	48	63
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	161	555	127	167	663	59	261	254	170	167	222	255
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	235	1135	259	246	1356	120	546	667	446	311	583	670
Grp Volume(v), veh/h	371	0	0	258	0	0	119	0	0	147	0	0
Grp Sat Flow(s),veh/h/ln	1629	0	0	1723	0	0	1660	0	0	1564	0	0
Q Serve(g_s), s	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.0	0.0	0.0	7.5	0.0	0.0	3.8	0.0	0.0	5.5	0.0	0.0
Prop In Lane	0.18		0.16	0.18		0.07	0.37		0.27	0.24		0.43
Lane Grp Cap(c), veh/h	843	0	0	889	0	0	685	0	0	644	0	0
V/C Ratio(X)	0.44	0.00	0.00	0.29	0.00	0.00	0.17	0.00	0.00	0.23	0.00	0.00
Avail Cap(c_a), veh/h	843	0	0	889	0	0	685	0	0	644	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.2	0.0	0.0	13.9	0.0	0.0	18.9	0.0	0.0	19.3	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.0	0.8	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	0.0	4.1	0.0	0.0	2.1	0.0	0.0	2.7	0.0	0.0
LnGrp Delay(d),s/veh	16.9	0.0	0.0	14.7	0.0	0.0	19.4	0.0	0.0	20.2	0.0	0.0
LnGrp LOS	B			B			B			C		
Approach Vol, veh/h		371			258			119			147	
Approach Delay, s/veh		16.9			14.7			19.4			20.2	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		15.0		7.5		9.5		5.8
Green Ext Time (p_c), s		2.3		0.8		1.6		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	290	252	46	44	1
Future Volume (vph)	0	290	252	46	44	1
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.979		0.997	
Flt Protected					0.953	
Satd. Flow (prot)	0	1602	1585	0	1386	0
Flt Permitted					0.953	
Satd. Flow (perm)	0	1602	1585	0	1386	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	319	277	51	48	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	319	328	0	49	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.9%		ICU Level of Service A	
Analysis Period (min) 15			

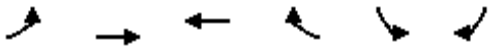
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	290	252	46	44	1
Future Vol, veh/h	0	290	252	46	44	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	319	277	51	48	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	328	0	-	0	622	303
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	319	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1243	-	-	-	423	729
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1243	-	-	-	423	729
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	716	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1243	-	-	-	427
HCM Lane V/C Ratio	-	-	-	-	0.116
HCM Control Delay (s)	0	-	-	-	14.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	327	291	10	7	7
Future Volume (vph)	7	327	291	10	7	7
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.932	
Flt Protected		0.999			0.976	
Satd. Flow (prot)	0	1601	1550	0	1510	0
Flt Permitted		0.999			0.976	
Satd. Flow (perm)	0	1601	1550	0	1510	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	10%	0%	0%
Adj. Flow (vph)	8	355	316	11	8	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	363	327	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	327	291	10	7	7
Future Vol, veh/h	7	327	291	10	7	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	10	0	0
Mvmt Flow	8	355	316	11	8	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	327	0	-	0	693	322
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1244	-	-	-	445	737
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	732	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1244	-	-	-	441	737
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	732	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1244	-	-	-	552
HCM Lane V/C Ratio	0.006	-	-	-	0.028
HCM Control Delay (s)	7.9	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	327	4	8	282	3	17
Future Volume (vph)	327	4	8	282	3	17
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.884	
Flt Protected				0.999	0.993	
Satd. Flow (prot)	1568	0	0	1626	1363	0
Flt Permitted				0.999	0.993	
Satd. Flow (perm)	1568	0	0	1626	1363	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	355	4	9	307	3	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	359	0	0	316	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	327	4	8	282	3	17
Future Vol, veh/h	327	4	8	282	3	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	355	4	9	307	3	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	359	0	682	357
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1211	-	469	713
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	778	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1211	-	465	713
Mov Cap-2 Maneuver	-	-	-	-	465	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	778	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	660	-	-	1211	-
HCM Lane V/C Ratio	0.033	-	-	0.007	-
HCM Control Delay (s)	10.6	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	3	298	53	0	238
Future Volume (vph)	40	3	298	53	0	238
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.992		0.980			
Flt Protected	0.955					
Satd. Flow (prot)	1558	0	1542	0	0	1603
Flt Permitted	0.955					
Satd. Flow (perm)	1558	0	1542	0	0	1603
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	45	3	339	60	0	270
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	399	0	0	270
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	3	298	53	0	238
Future Vol, veh/h	40	3	298	53	0	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	45	3	339	60	0	270

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	639	369	0	0	399	0
Stage 1	369	-	-	-	-	-
Stage 2	270	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	755	794	-	-	1171	-
Stage 1	957	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	794	-	-	1171	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	977	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	758	1171	-
HCM Lane V/C Ratio	-	-	0.064	-	-
HCM Control Delay (s)	-	-	10.1	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

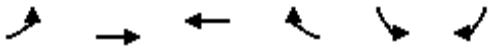
Appendix F. Design Year 2048 Traffic Volume Development

Approach	Movement	2018 Existing Conditions (RAW DATA - FROM TMC's)			2018 Existing Conditions - Volume Balancing Along Greenbag Road Between Dorsey/Kingwood and Richard Lane[1]			2018 Existing Conditions (BALANCED)			Forecasted 2048 Design Year (2018 Existing Yr Bal + 30 Yrs)[2]			Forecasted 2048 Design Year Reroute Luckey Lane Traffic (Due to Termination at Greenbag. Reconnection via Richard Avenue)			Forecasted 2048 Design Year With Reroute Luckey Lane Traffic		
		Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
		Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Growth Rate =	1.16%	Per Year, Linear	Volume	Volume	Volume	Volume	Volume	Volume
Intersection:		**Greenbag Road (CR 857) & Mississippi Avenue**																	
Eastbound	Left Turn	109	140	34				109	140	34	147	189	46				147	189	46
Greenbag Rd	Through	240	497	345				240	497	345	324	670	465				324	670	465
Westbound	Through	412	372	256				412	372	256	555	501	345				555	501	345
Greenbag Rd	Right Turn	163	132	30				163	132	30	220	178	40				220	178	40
Southbound	Left Turn	107	41	21				107	41	21	144	55	28				144	55	28
Mississippi	Right Turn	104	68	27				104	68	27	140	92	36				140	92	36
Intersection:		**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**																	
Eastbound	Left Turn	51	108	67				51	108	67	69	146	90				69	146	90
Greenbag Rd	Through	255	346	232	18	40	7	273	386	239	368	520	322				368	520	322
	Right Turn	26	110	58				26	110	58	35	148	78				35	148	78
Westbound	Left Turn	22	77	46	1	10	0	23	87	46	31	117	62				31	117	62
Greenbag Rd	Through	334	275	189	19	36	0	353	311	189	476	419	255				476	419	255
	Right Turn	13	19	18	1	3	0	14	22	18	19	30	24	115	162	59	134	192	83
Northbound	Left Turn	142	52	43				142	52	43	191	70	58				191	70	58
Kingwood	Through	149	58	42				149	58	42	201	78	57				201	78	57
Pike	Right Turn	123	44	31	8	6	0	131	50	31	177	67	42				177	67	42
Southbound	Left Turn	60	89	34	3	10	1	63	99	35	85	133	47	56	70	56	141	203	103
Dorsey Ave	Through	19	157	47				19	157	47	26	212	63				26	212	63
	Right Turn	115	107	62				115	107	62	155	144	84	0	3	1	155	147	85
Intersection:		**Greenbag Road (CR 857) & Luckey Lane**																	
Eastbound	Left Turn	0	0	0				0	0	0	0	0	0				0	0	0
Greenbag Rd	Through	409	423	289	1	0	1	410	423	290	553	570	391	56	70	56	609	640	447
Westbound	Through	390	418	251	0	0	1	390	418	252	526	563	340	115	162	59	641	725	399
Greenbag Rd	Right Turn	90	127	46				90	127	46	121	171	62	-121	-171	-62	0	0	0
Southbound	Left Turn	44	55	44				44	55	44	59	74	59	-59	-74	-59	0	0	0
Luckey Ln	Right Turn	0	2	1				0	2	1	0	3	1	0	-3	-1	0	0	0

Approach	Movement	2018 Existing Conditions (RAW DATA)			2018 Existing Conditions - Volume Balancing Along Greenbag Road Between Dorsey/Kingwood and Richard Lane[1]			2018 Existing Conditions (BALANCED)			Forecasted 2048 Design Year (2018 Existing Yr Bal + 30 Yrs)[2]			Forecasted 2048 Design Year Reroute Luckey Lane Traffic (Due to Termination at Greenbag. Reconnection via Richard Avenue)			Forecasted 2048 Design Year Reroute Luckey Lane Traffic (Due to Termination at Greenbag. Reconnection via Richard Avenue)		
		Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
		Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Growth Rate =	1.16%	Per Year, Linear	Volume	Volume	Volume	Volume	Volume	Volume
Intersection:	**Greenbag Road (CR 857) & Richard Avenue**																		
Eastbound	Left Turn	59	13	7				59	13	7	80	18	9				80	18	9
Greenbag Rd	Through	395	464	327	0	1	0	395	465	327	532	627	441	-3	-4	-3	529	623	438
Westbound	Through	417	521	290	0	1	1	417	522	291	562	704	392	-6	-9	-3	556	695	389
Greenbag Rd	Right Turn	51	10	10				51	10	10	69	13	13	6	9	3	75	22	16
Southbound	Left Turn	34	19	7				34	19	7	46	26	9	3	4	3	49	30	12
Richard Ave	Right Turn	63	23	7				63	23	7	85	31	9				85	31	9
Intersection:	**Greenbag Road (CR 857) & Lower Aarons Creek Road (CR 64)**																		
Eastbound	Through	444	471	327				444	471	327	599	635	441				599	635	441
Greenbag Rd	Right Turn	3	9	4				3	9	4	4	12	5				4	12	5
Westbound	Left Turn	4	31	8				4	31	8	5	42	11				5	42	11
Greenbag Rd	Through	399	477	282				399	477	282	538	643	380				538	643	380
Northbound	Left Turn	17	8	3				17	8	3	23	11	4				23	11	4
Lower	Right Turn	16	12	17				16	12	17	22	16	23				22	16	23
Intersection:	**Greenbag Road (CR 857) & Diamond Avenue**																		
Northbound	Through	402	371	298				402	371	298	542	500	402				542	500	402
Greenbag Rd	Right Turn	60	113	53				60	113	53	81	152	71				81	152	71
Southbound	Left Turn	1	5	0				1	5	0	1	7	0				1	7	0
Greenbag Rd	Through	330	439	238				330	439	238	445	592	321				445	592	321
Westbound	Left Turn	76	65	40				76	65	40	102	88	54				102	88	54
Diamond Ave	Right Turn	5	4	3				5	4	3	7	5	4				7	5	4

(1) Due to the close proximity of the intersections on Greenbag Road, between Dorsey Avenue/Kingwood Pike and Richard Avenue, peak hour traffic volumes were balanced.
(2) 2048 Design Year Volumes were grown by applying a 1.16% per year, linear, growth rate, obtained from the MMMPO.

Appendix G. Forecasted 2048 Design Year Without Improvements Capacity and Queue Analyses



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962		0.933	
Flt Protected		0.985			0.975	
Satd. Flow (prot)	0	1596	1481	0	1426	0
Flt Permitted		0.985			0.975	
Satd. Flow (perm)	0	1596	1481	0	1426	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	548	901	0	330	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	154.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	324	555	220	144	140
Future Vol, veh/h	147	324	555	220	144	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	171	377	645	256	167	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	901	0	-	0	1492	773
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	742	-	-	-	~ 106	369
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	~ 75	369
Mov Cap-2 Maneuver	-	-	-	-	~ 75	-
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	$ 826.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	124
HCM Lane V/C Ratio	0.23	-	-	-	2.663
HCM Control Delay (s)	11.3	0	-	-	$ 826.4
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	29.9

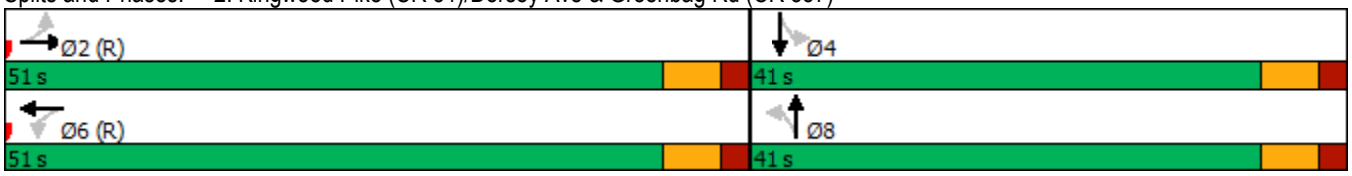
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.995			0.958			0.921	
Flt Protected		0.993			0.997			0.983			0.984	
Satd. Flow (prot)	0	1621	0	0	1726	0	0	1711	0	0	1457	0
Flt Permitted		0.841			0.950			0.755			0.666	
Satd. Flow (perm)	0	1373	0	0	1645	0	0	1314	0	0	986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			3			28			88	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	513	0	0	572	0	0	618	0	0	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.76			0.71			1.20			0.67	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		28.0			24.3			133.2			25.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		28.0			24.3			133.2			25.2	
LOS		C			C			F			C	
Approach Delay		28.0			24.3			133.2			25.2	
Approach LOS		C			C			F			C	
Queue Length 50th (ft)		231			248			~431			95	
Queue Length 95th (ft)		370			378			#643			196	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		674			806			517			429	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.76			0.71			1.20			0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 59.2		Intersection LOS: E	
Intersection Capacity Utilization 97.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

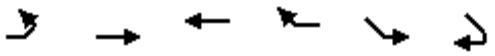
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1706	1843	1919	1800	1919	1966	1947	1966	1834	1723	1834
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	1	1	1	0	0	0
Cap, veh/h	122	585	53	71	789	31	227	197	168	167	65	252
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	157	1196	108	60	1613	64	460	518	441	302	171	662
Grp Volume(v), veh/h	513	0	0	572	0	0	618	0	0	288	0	0
Grp Sat Flow(s),veh/h/ln	1462	0	0	1736	0	0	1418	0	0	1135	0	0
Q Serve(g_s), s	2.7	0.0	0.0	0.0	0.0	0.0	16.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	25.0	0.0	0.0	22.3	0.0	0.0	35.0	0.0	0.0	18.2	0.0	0.0
Prop In Lane	0.15		0.07	0.06		0.04	0.34		0.31	0.32		0.58
Lane Grp Cap(c), veh/h	760	0	0	891	0	0	592	0	0	483	0	0
V/C Ratio(X)	0.68	0.00	0.00	0.64	0.00	0.00	1.04	0.00	0.00	0.60	0.00	0.00
Avail Cap(c_a), veh/h	760	0	0	891	0	0	592	0	0	483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.9	0.0	0.0	17.7	0.0	0.0	30.7	0.0	0.0	22.8	0.0	0.0
Incr Delay (d2), s/veh	4.8	0.0	0.0	3.5	0.0	0.0	49.0	0.0	0.0	5.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	0.0	0.0	11.7	0.0	0.0	23.0	0.0	0.0	6.6	0.0	0.0
LnGrp Delay(d),s/veh	22.6	0.0	0.0	21.2	0.0	0.0	79.7	0.0	0.0	28.1	0.0	0.0
LnGrp LOS	C			C			F			C		
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		22.6			21.2			79.7			28.1	
Approach LOS		C			C			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		27.0		20.2		24.3		37.0
Green Ext Time (p_c), s		3.2		1.6		3.6		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	553	526	121	59	0
Future Volume (vph)	0	553	526	121	59	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			
Flt Protected					0.950	
Satd. Flow (prot)	0	1499	1514	0	1386	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1499	1514	0	1386	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	8%	5%	1%	0%	0%
Adj. Flow (vph)	0	658	626	144	70	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	658	770	0	70	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

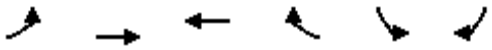
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	553	526	121	59	0
Future Vol, veh/h	0	553	526	121	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	8	5	1	0	0
Mvmt Flow	0	658	626	144	70	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	770	0	-	0	1356	698
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	658	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	854	-	-	-	143	427
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	854	-	-	-	143	427
Mov Cap-2 Maneuver	-	-	-	-	143	-
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	52.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	854	-	-	-	143
HCM Lane V/C Ratio	-	-	-	-	0.491
HCM Control Delay (s)	0	-	-	-	52.3
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	532	562	69	46	85
Future Volume (vph)	80	532	562	69	46	85
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.912	
Flt Protected		0.994			0.983	
Satd. Flow (prot)	0	1495	1456	0	1488	0
Flt Permitted		0.994			0.983	
Satd. Flow (perm)	0	1495	1456	0	1488	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	25%	5%	5%	12%	0%	0%
Adj. Flow (vph)	93	619	653	80	53	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	712	733	0	152	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	532	562	69	46	85
Future Vol, veh/h	80	532	562	69	46	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	25	5	5	12	0	0
Mvmt Flow	93	619	653	80	53	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	733	0	-	0	1498	693
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	805	-
Critical Hdwy	4.35	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.425	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	776	-	-	-	161	464
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	776	-	-	-	132	464
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	485	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	40.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	776	-	-	-	246
HCM Lane V/C Ratio	0.12	-	-	-	0.619
HCM Control Delay (s)	10.3	0	-	-	40.8
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	-	3.7



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	599	4	5	538	23	22
Future Volume (vph)	599	4	5	538	23	22
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.934	
Flt Protected					0.975	
Satd. Flow (prot)	1525	0	0	1596	1414	0
Flt Permitted					0.975	
Satd. Flow (perm)	1525	0	0	1596	1414	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	4%	0%	0%	3%	0%	0%
Adj. Flow (vph)	740	5	6	664	28	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	745	0	0	670	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	599	4	5	538	23	22
Future Vol, veh/h	599	4	5	538	23	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	740	5	6	664	28	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	745	0	1419	743
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	872	-	193	445
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	191	445
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	22.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	265	-	-	872	-
HCM Lane V/C Ratio	0.21	-	-	0.007	-
HCM Control Delay (s)	22.2	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	102	7	542	81	1	445
Future Volume (vph)	102	7	542	81	1	445
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991		0.982			
Flt Protected	0.955					
Satd. Flow (prot)	1557	0	1493	0	0	1542
Flt Permitted	0.955					
Satd. Flow (perm)	1557	0	1493	0	0	1542
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	5%	0%	0%	5%
Adj. Flow (vph)	116	8	616	92	1	506
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	708	0	0	507
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

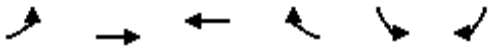
Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	102	7	542	81	1	445
Future Vol, veh/h	102	7	542	81	1	445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	5	0	0	5
Mvmt Flow	116	8	616	92	1	506

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1170	662	0	0	708	0
Stage 1	662	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	570	613	-	-	900	-
Stage 1	897	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	569	613	-	-	900	-
Mov Cap-2 Maneuver	569	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	572	900	-
HCM Lane V/C Ratio	-	-	0.217	0.001	-
HCM Control Delay (s)	-	-	13	9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965		0.915	
Flt Protected		0.989			0.982	
Satd. Flow (prot)	0	1633	1547	0	1603	0
Flt Permitted		0.989			0.982	
Satd. Flow (perm)	0	1633	1547	0	1603	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	923	730	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	112.4%	ICU Level of Service	H
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	30

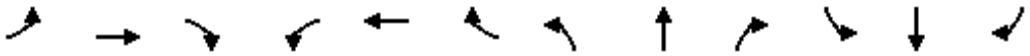
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	670	501	178	55	92
Future Vol, veh/h	189	670	501	178	55	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	203	720	539	191	59	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	730	0	-	0	1761	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	1126	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	879	-	-	-	77	464
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	~ 47	464
Mov Cap-2 Maneuver	-	-	-	-	~ 47	-
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	276	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	$ 330.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	879	-	-	-	107
HCM Lane V/C Ratio	0.231	-	-	-	1.477
HCM Control Delay (s)	10.3	0	-	-	$ 330.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	11.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

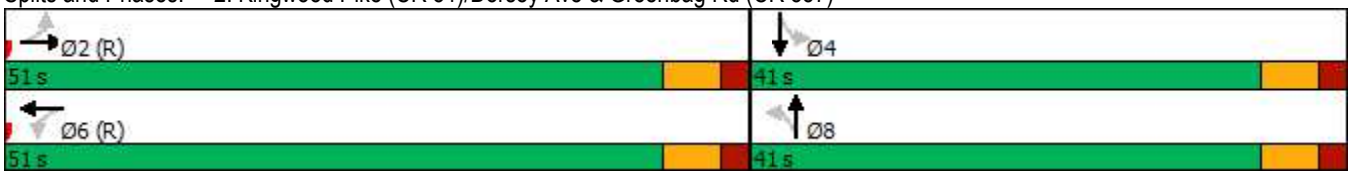


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.993			0.958			0.960	
Flt Protected		0.991			0.990			0.984			0.987	
Satd. Flow (prot)	0	1710	0	0	1810	0	0	1680	0	0	1608	0
Flt Permitted		0.737			0.630			0.674			0.817	
Satd. Flow (perm)	0	1272	0	0	1152	0	0	1150	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			28			26	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	914	0	0	636	0	0	242	0	0	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		1.45			1.13			0.53			1.05	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		235.4			102.6			24.6			82.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		235.4			102.6			24.6			82.4	
LOS		F			F			C			F	
Approach Delay		235.4			102.6			24.6			82.4	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)		~734			~433			95			~342	
Queue Length 95th (ft)		#954			#634			168			#535	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		630			565			454			522	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.45			1.13			0.53			1.05	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 130			
Control Type: Pretimed			
Maximum v/c Ratio: 1.45			
Intersection Signal Delay: 141.6		Intersection LOS: F	
Intersection Capacity Utilization 100.9%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

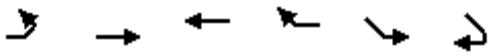
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1831	1843	1919	1905	1919	1966	1909	1966	1834	1818	1834
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	0	0	0
Cap, veh/h	137	378	104	141	437	30	172	190	139	191	262	169
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	186	773	213	192	893	61	316	499	366	371	689	444
Grp Volume(v), veh/h	914	0	0	636	0	0	242	0	0	549	0	0
Grp Sat Flow(s),veh/h/ln	1172	0	0	1146	0	0	1181	0	0	1505	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.8	0.0	0.0
Cycle Q Clear(g_c), s	45.0	0.0	0.0	45.0	0.0	0.0	12.9	0.0	0.0	32.8	0.0	0.0
Prop In Lane	0.18		0.18	0.21		0.05	0.33		0.31	0.27		0.30
Lane Grp Cap(c), veh/h	620	0	0	608	0	0	501	0	0	622	0	0
V/C Ratio(X)	1.48	0.00	0.00	1.05	0.00	0.00	0.48	0.00	0.00	0.88	0.00	0.00
Avail Cap(c_a), veh/h	620	0	0	608	0	0	501	0	0	622	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.4	0.0	0.0	23.7	0.0	0.0	21.1	0.0	0.0	27.8	0.0	0.0
Incr Delay (d2), s/veh	222.6	0.0	0.0	49.2	0.0	0.0	3.3	0.0	0.0	16.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	54.0	0.0	0.0	23.7	0.0	0.0	5.1	0.0	0.0	16.4	0.0	0.0
LnGrp Delay(d),s/veh	246.9	0.0	0.0	72.9	0.0	0.0	24.4	0.0	0.0	44.3	0.0	0.0
LnGrp LOS	F			F			C			D		
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		246.9			72.9			24.4			44.3	
Approach LOS		F			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		47.0		34.8		47.0		14.9
Green Ext Time (p_c), s		0.0		0.1		0.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	129.1
HCM 2010 LOS	F



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	570	563	171	74	3
Future Volume (vph)	0	570	563	171	74	3
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969		0.995	
Flt Protected					0.954	
Satd. Flow (prot)	0	1618	1557	0	1385	0
Flt Permitted					0.954	
Satd. Flow (perm)	0	1618	1557	0	1385	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	0	588	580	176	76	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	588	756	0	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

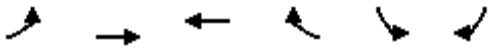
Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	570	563	171	74	3
Future Vol, veh/h	0	570	563	171	74	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	588	580	176	76	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1256	668
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	588	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	864	-	-	-	166	445
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	524	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	864	-	-	-	166	445
Mov Cap-2 Maneuver	-	-	-	-	166	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	524	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	43.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	864	-	-	-	170
HCM Lane V/C Ratio	-	-	-	-	0.467
HCM Control Delay (s)	0	-	-	-	43.5
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2.2



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	627	704	13	26	31
Future Volume (vph)	18	627	704	13	26	31
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.927	
Flt Protected		0.999			0.978	
Satd. Flow (prot)	0	1617	1542	0	1505	0
Flt Permitted		0.999			0.978	
Satd. Flow (perm)	0	1617	1542	0	1505	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	1%	10%	0%	0%
Adj. Flow (vph)	18	640	718	13	27	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	658	731	0	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	627	704	13	26	31
Future Vol, veh/h	18	627	704	13	26	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	10	0	0
Mvmt Flow	18	640	718	13	27	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	731	0	-	0	1401	725
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	883	-	-	-	182	446
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	883	-	-	-	176	446
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	22.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	883	-	-	-	262
HCM Lane V/C Ratio	0.021	-	-	-	0.222
HCM Control Delay (s)	9.2	0	-	-	22.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	635	12	42	643	11	16
Future Volume (vph)	635	12	42	643	11	16
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.921	
Flt Protected				0.997	0.980	
Satd. Flow (prot)	1551	0	0	1581	1215	0
Flt Permitted				0.997	0.980	
Satd. Flow (perm)	1551	0	0	1581	1215	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	13%	3%	13%	17%
Adj. Flow (vph)	676	13	45	684	12	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	689	0	0	729	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	635	12	42	643	11	16
Future Vol, veh/h	635	12	42	643	11	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	13	3	13	17
Mvmt Flow	676	13	45	684	12	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	689	0	1457	683
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	774	-
Critical Hdwy	-	-	4.23	-	5.93	6.07
Critical Hdwy Stg 1	-	-	-	-	4.93	-
Critical Hdwy Stg 2	-	-	-	-	4.93	-
Follow-up Hdwy	-	-	2.317	-	3.617	3.453
Pot Cap-1 Maneuver	-	-	856	-	172	449
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	856	-	157	449
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	20.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	255	-	-	856	-
HCM Lane V/C Ratio	0.113	-	-	0.052	-
HCM Control Delay (s)	20.9	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	88	5	500	152	7	592
Future Volume (vph)	88	5	500	152	7	592
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993		0.969			
Flt Protected	0.955					0.999
Satd. Flow (prot)	1531	0	1503	0	0	1556
Flt Permitted	0.955					0.999
Satd. Flow (perm)	1531	0	1503	0	0	1556
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	3%	0%	0%	4%
Adj. Flow (vph)	92	5	521	158	7	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	0	679	0	0	624
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

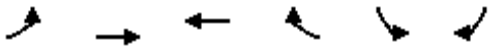
Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	88	5	500	152	7	592
Future Vol, veh/h	88	5	500	152	7	592
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	3	0	0	4
Mvmt Flow	92	5	521	158	7	617

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1231	600	0	0	679	0
Stage 1	600	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Critical Hdwy	3.42	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.42	-	-	-	-	-
Critical Hdwy Stg 2	2.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	546	648	-	-	923	-
Stage 1	904	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	539	648	-	-	923	-
Mov Cap-2 Maneuver	539	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	897	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	544	923	-
HCM Lane V/C Ratio	-	-	0.178	0.008	-
HCM Control Delay (s)	-	-	13	8.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	465	345	40	28	36
Future Volume (vph)	46	465	345	40	28	36
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986		0.925	
Flt Protected		0.996			0.978	
Satd. Flow (prot)	0	1642	1576	0	1624	0
Flt Permitted		0.996			0.978	
Satd. Flow (perm)	0	1642	1576	0	1624	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%
Adj. Flow (vph)	49	495	367	43	30	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	544	410	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

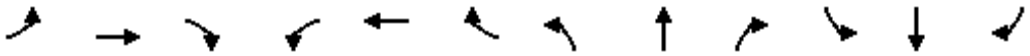
Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	465	345	40	28	36
Future Vol, veh/h	46	465	345	40	28	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	1	2	0	0	0
Mvmt Flow	49	495	367	43	30	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	410	0	-	0	982	389
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	593	-
Critical Hdwy	4.13	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1143	-	-	-	250	650
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1143	-	-	-	235	650
Mov Cap-2 Maneuver	-	-	-	-	235	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1143	-	-	-	367
HCM Lane V/C Ratio	0.043	-	-	-	0.186
HCM Control Delay (s)	8.3	0	-	-	17
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

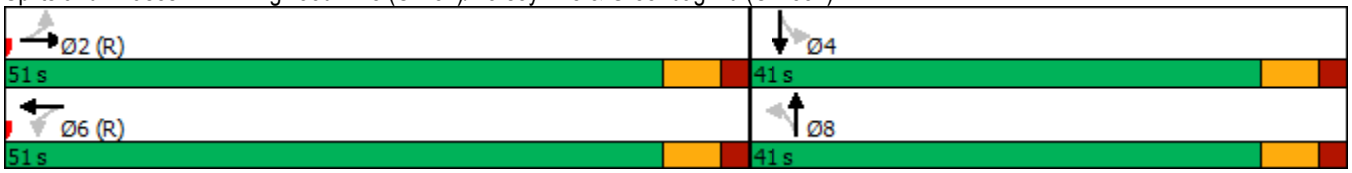


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.991			0.964			0.941	
Flt Protected		0.991			0.991			0.982			0.988	
Satd. Flow (prot)	0	1701	0	0	1808	0	0	1737	0	0	1571	0
Flt Permitted		0.869			0.851			0.828			0.895	
Satd. Flow (perm)	0	1491	0	0	1553	0	0	1465	0	0	1423	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			6			23			48	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	92	329	80	63	260	24	59	58	43	48	64	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	501	0	0	347	0	0	160	0	0	198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.68			0.46			0.28			0.35	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		23.2			17.6			18.4			17.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.2			17.6			18.4			17.2	
LOS		C			B			B			B	
Approach Delay		23.2			17.6			18.4			17.2	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		208			125			54			59	
Queue Length 95th (ft)		327			198			101			116	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		736			762			571			571	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.68			0.46			0.28			0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 20.0		Intersection LOS: B	
Intersection Capacity Utilization 59.9%		ICU Level of Service B	
Analysis Period (min) 15			

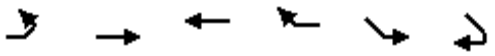
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1815	1843	1919	1905	1919	1966	1966	1966	1834	1810	1834
Adj Flow Rate, veh/h	92	329	80	63	260	24	59	58	43	48	64	86
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	1	1	1	1	1	0	0	0	0	0	0
Cap, veh/h	162	549	126	159	634	55	259	253	169	165	219	257
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	237	1123	258	230	1296	113	541	666	444	305	575	675
Grp Volume(v), veh/h	501	0	0	347	0	0	160	0	0	198	0	0
Grp Sat Flow(s),veh/h/ln	1619	0	0	1639	0	0	1651	0	0	1555	0	0
Q Serve(g_s), s	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Cycle Q Clear(g_c), s	19.9	0.0	0.0	11.2	0.0	0.0	5.3	0.0	0.0	7.8	0.0	0.0
Prop In Lane	0.18		0.16	0.18		0.07	0.37		0.27	0.24		0.43
Lane Grp Cap(c), veh/h	838	0	0	848	0	0	682	0	0	640	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.41	0.00	0.00	0.23	0.00	0.00	0.31	0.00	0.00
Avail Cap(c_a), veh/h	838	0	0	848	0	0	682	0	0	640	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	14.7	0.0	0.0	19.3	0.0	0.0	20.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	1.5	0.0	0.0	0.8	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	0.0	0.0	5.8	0.0	0.0	2.9	0.0	0.0	3.7	0.0	0.0
LnGrp Delay(d),s/veh	20.0	0.0	0.0	16.2	0.0	0.0	20.1	0.0	0.0	21.3	0.0	0.0
LnGrp LOS	C			B			C			C		
Approach Vol, veh/h		501			347			160			198	
Approach Delay, s/veh		20.0			16.2			20.1			21.3	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0
Max Q Clear Time (g_c+I1), s		21.9		9.8		13.2		7.3
Green Ext Time (p_c), s		3.2		1.1		2.2		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	19.1
HCM 2010 LOS	B



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	391	340	62	59	1
Future Volume (vph)	0	391	340	62	59	1
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.979		0.998	
Flt Protected					0.953	
Satd. Flow (prot)	0	1602	1585	0	1387	0
Flt Permitted					0.953	
Satd. Flow (perm)	0	1602	1585	0	1387	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	430	374	68	65	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	430	442	0	66	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.23	1.23	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.6%		ICU Level of Service A	
Analysis Period (min) 15			

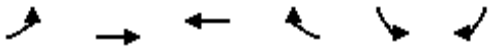
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	391	340	62	59	1
Future Vol, veh/h	0	391	340	62	59	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	430	374	68	65	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	442	0	-	0	838	408
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	430	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1129	-	-	-	309	633
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1129	-	-	-	309	633
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	629	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	19.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1129	-	-	-	312
HCM Lane V/C Ratio	-	-	-	-	0.211
HCM Control Delay (s)	0	-	-	-	19.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	441	392	13	9	9
Future Volume (vph)	9	441	392	13	9	9
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.932	
Flt Protected		0.999			0.976	
Satd. Flow (prot)	0	1601	1552	0	1510	0
Flt Permitted		0.999			0.976	
Satd. Flow (perm)	0	1601	1552	0	1510	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	10%	0%	0%
Adj. Flow (vph)	10	479	426	14	10	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	489	440	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	441	392	13	9	9
Future Vol, veh/h	9	441	392	13	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	10	0	0
Mvmt Flow	10	479	426	14	10	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	932	433
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1131	-	-	-	331	642
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	649	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1131	-	-	-	327	642
Mov Cap-2 Maneuver	-	-	-	-	327	-
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	649	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1131	-	-	-	433
HCM Lane V/C Ratio	0.009	-	-	-	0.045
HCM Control Delay (s)	8.2	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	441	5	11	380	4	23
Future Volume (vph)	441	5	11	380	4	23
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.884	
Flt Protected				0.999	0.993	
Satd. Flow (prot)	1570	0	0	1626	1363	0
Flt Permitted				0.999	0.993	
Satd. Flow (perm)	1570	0	0	1626	1363	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	479	5	12	413	4	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	484	0	0	425	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	441	5	11	380	4	23
Future Vol, veh/h	441	5	11	380	4	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	479	5	12	413	4	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	919	482
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1089	-	354	613
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1089	-	349	613
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	551	-	-	1089	-
HCM Lane V/C Ratio	0.053	-	-	0.011	-
HCM Control Delay (s)	11.9	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	4	402	71	0	321
Future Volume (vph)	54	4	402	71	0	321
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990		0.980			
Flt Protected	0.956					
Satd. Flow (prot)	1557	0	1542	0	0	1603
Flt Permitted	0.956					
Satd. Flow (perm)	1557	0	1542	0	0	1603
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	61	5	457	81	0	365
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	0	538	0	0	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	4	402	71	0	321
Future Vol, veh/h	54	4	402	71	0	321
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	61	5	457	81	0	365

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	863	498	0	0	538	0
Stage 1	498	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	673	709	-	-	1040	-
Stage 1	931	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	673	709	-	-	1040	-
Mov Cap-2 Maneuver	673	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	958	-	-	-	-	-

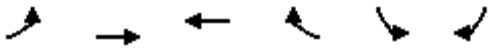
Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	675	1040	-
HCM Lane V/C Ratio	-	-	0.098	-	-
HCM Control Delay (s)	-	-	10.9	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & MISSISSIPPI AVENUE



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962		0.933	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1509	1635	1481	0	1426	0
Flt Permitted	0.950				0.975	
Satd. Flow (perm)	1509	1635	1481	0	1426	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	377	901	0	330	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 85.2%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	52.4

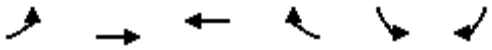
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	324	555	220	144	140
Future Vol, veh/h	147	324	555	220	144	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	171	377	645	256	167	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	901	0	-	0	1492	773
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	742	-	-	-	~ 106	369
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	~ 82	369
Mov Cap-2 Maneuver	-	-	-	-	~ 162	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	276.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	224
HCM Lane V/C Ratio	0.23	-	-	-	1.474
HCM Control Delay (s)	11.3	-	-	-	276.3
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	19.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965		0.915	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1569	1651	1547	0	1603	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1569	1651	1547	0	1603	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	720	730	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	16.1

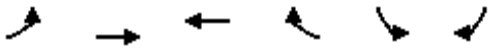
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	670	501	178	55	92
Future Vol, veh/h	189	670	501	178	55	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	203	720	539	191	59	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	730	0	-	0	1761	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	1126	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	879	-	-	-	77	464
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	~ 59	464
Mov Cap-2 Maneuver	-	-	-	-	66	-
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	276	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	171.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	879	-	-	-	142
HCM Lane V/C Ratio	0.231	-	-	-	1.113
HCM Control Delay (s)	10.3	-	-	-	171.3
HCM Lane LOS	B	-	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	8.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	465	345	40	28	36
Future Volume (vph)	46	465	345	40	28	36
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1538	1651	1576	0	1624	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1538	1651	1576	0	1624	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%
Adj. Flow (vph)	49	495	367	43	30	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	495	410	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.5%		ICU Level of Service A	
Analysis Period (min) 15			

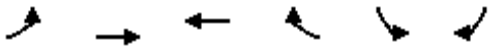
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	465	345	40	28	36
Future Vol, veh/h	46	465	345	40	28	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	1	2	0	0	0
Mvmt Flow	49	495	367	43	30	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	410	0	-	0	982	389
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	593	-
Critical Hdwy	4.13	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1143	-	-	-	250	650
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1143	-	-	-	239	650
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1143	-	-	-	474
HCM Lane V/C Ratio	0.043	-	-	-	0.144
HCM Control Delay (s)	8.3	-	-	-	13.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1509	1635	1481	0	1445	1375
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1509	1635	1481	0	1445	1375
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	377	901	0	167	163
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	16

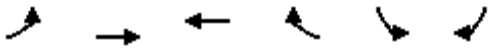
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	324	555	220	144	140
Future Vol, veh/h	147	324	555	220	144	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	171	377	645	256	167	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	901	0	-	0	1492	773
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	742	-	-	-	~ 106	369
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	~ 82	369
Mov Cap-2 Maneuver	-	-	-	-	~ 162	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	80.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	742	-	-	-	162	369
HCM Lane V/C Ratio	0.23	-	-	-	1.034	0.441
HCM Control Delay (s)	11.3	-	-	-	136.7	22.2
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0.9	-	-	-	8.3	2.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1569	1651	1547	0	1705	1511
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1569	1651	1547	0	1705	1511
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	720	730	0	59	99
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8.1

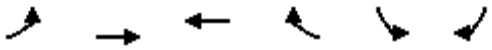
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	670	501	178	55	92
Future Vol, veh/h	189	670	501	178	55	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	203	720	539	191	59	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	730	0	-	0	1761	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	1126	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	879	-	-	-	77	464
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	~ 59	464
Mov Cap-2 Maneuver	-	-	-	-	66	-
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	276	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	79
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	879	-	-	-	66	464
HCM Lane V/C Ratio	0.231	-	-	-	0.896	0.213
HCM Control Delay (s)	10.3	-	-	-	186.3	14.8
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.9	-	-	-	4.3	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	465	345	40	28	36
Future Volume (vph)	46	465	345	40	28	36
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Storage Length (ft)	75			650	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1538	1651	1576	0	1705	1526
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1538	1651	1576	0	1705	1526
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%
Adj. Flow (vph)	49	495	367	43	30	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	495	410	0	30	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane			Yes			
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	465	345	40	28	36
Future Vol, veh/h	46	465	345	40	28	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	1	2	0	0	0
Mvmt Flow	49	495	367	43	30	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	410	0	-	0	982	389
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	593	-
Critical Hdwy	4.13	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.227	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1143	-	-	-	250	650
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1143	-	-	-	239	650
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	521	-

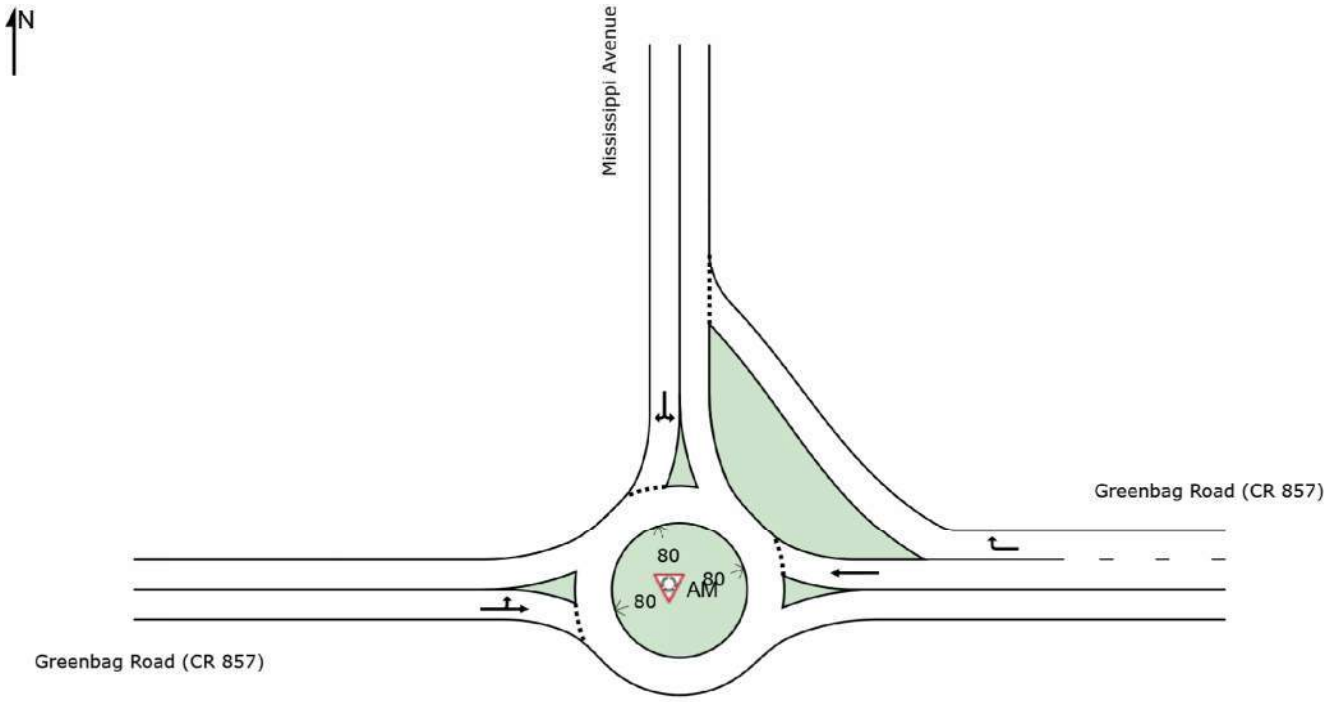
Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1143	-	-	-	352	650
HCM Lane V/C Ratio	0.043	-	-	-	0.085	0.059
HCM Control Delay (s)	8.3	-	-	-	16.2	10.9
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0.2

SITE LAYOUT

Site: AM [Greenbag & Mississippi - AM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: AM Peak
Roundabout



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Organisation: STAHL SHAEFFER ENGINEERING LLC | Created: Friday, January 25, 2019 8:08:23 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\1 - Greenbag and Mississippi Options\Option 2 - Roundabout SIDRA\Greenbag & Mississippi Roundabout SIDRA - Single Lane.sip8

MOVEMENT SUMMARY

Site: AM [Greenbag & Mississippi - AM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	645	4.0	0.487	5.4	LOS A	3.9	99.8	0.50	0.51	0.50	35.7
16	R2	256	10.0	0.206	4.9	LOS A	1.2	32.6	0.39	0.53	0.39	35.5
Approach		901	5.7	0.487	5.3	LOS A	3.9	99.8	0.47	0.51	0.47	35.6
North: Mississippi Avenue												
7	L2	167	18.0	0.526	13.6	LOS B	4.2	116.9	0.85	1.01	1.03	23.3
14	R2	163	11.0	0.526	8.9	LOS A	4.2	116.9	0.85	1.01	1.03	22.5
Approach		330	14.5	0.526	11.3	LOS B	4.2	116.9	0.85	1.01	1.03	22.9
West: Greenbag Road (CR 857)												
5	L2	171	5.0	0.507	11.2	LOS B	4.1	105.7	0.59	0.61	0.59	34.9
2	T1	377	2.0	0.507	5.8	LOS A	4.1	105.7	0.59	0.61	0.59	34.9
Approach		548	2.9	0.507	7.5	LOS A	4.1	105.7	0.59	0.61	0.59	34.9
All Vehicles		1779	6.5	0.526	7.1	LOS A	4.2	116.9	0.58	0.63	0.61	32.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

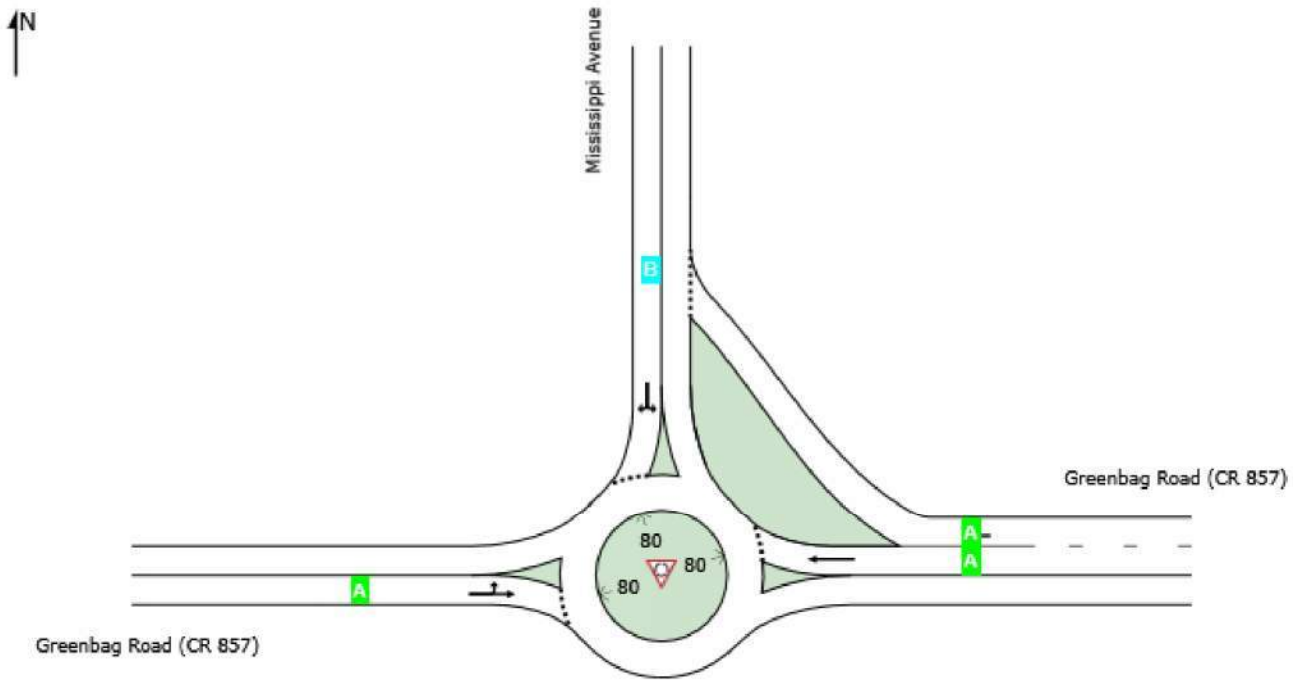
LANE LEVEL OF SERVICE

Lane Level of Service

Site: AM [Greenbag & Mississippi - AM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: AM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	B	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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QUEUE DISTANCE (%ILE)

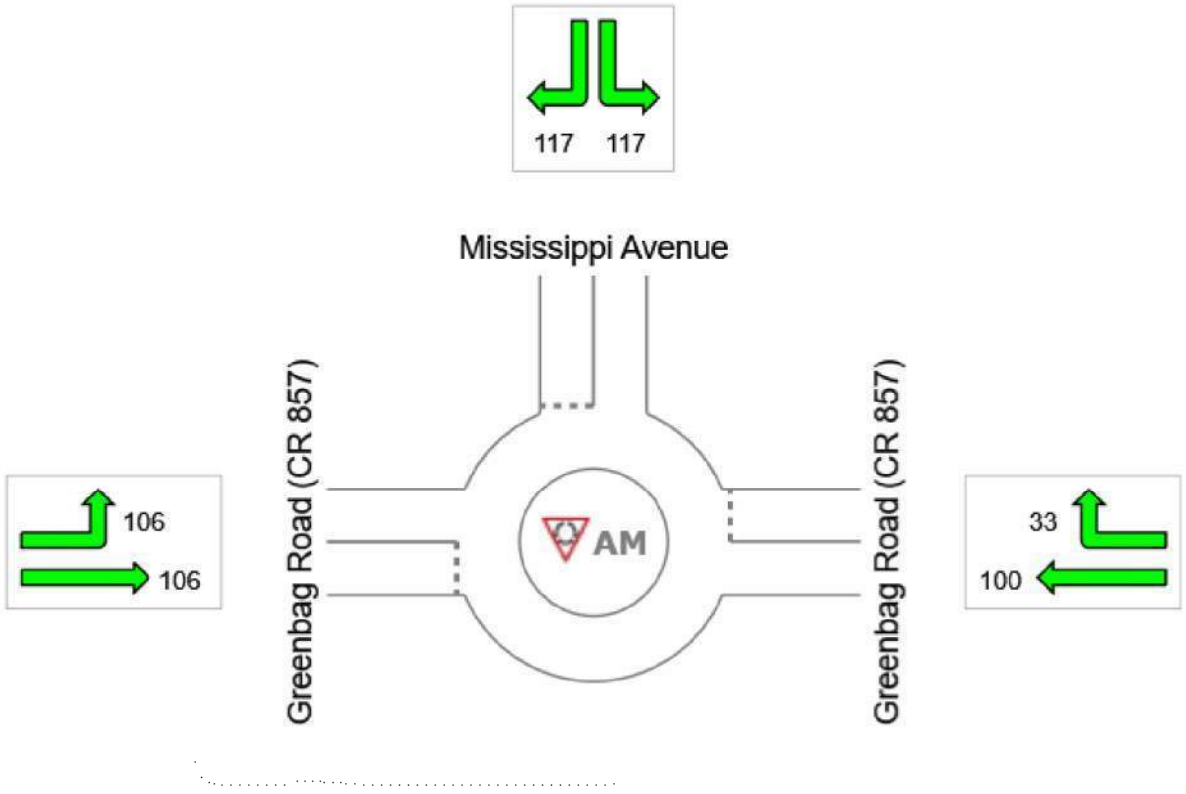
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: AM [Greenbag & Mississippi - AM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	100	117	106	117



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: AM [Greenbag & Mississippi - AM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	2	14.00	1600	NA	0.0N
North: Mississippi Avenue										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N
West: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
	W	T1	1 Dominant	171	1.05	179	0.0	0.0	N	0.972	14.7	2.00	0.196
	N	R2	2 Excl. Slip	171	1.05	179	0.0	0.0	N	0.972	14.7	2.00	0.196
North: Mississippi Avenue													
	E	L2	1 Dominant	645	1.04	671	0.0	0.0	N	0.894	22.4	2.00	0.567
	W	R2	1 Dominant	645	1.04	671	0.0	0.0	N	0.894	22.4	2.00	0.567
West: Greenbag Road (CR 857)													
	N	L2	1 Dominant	167	1.18	198	0.0	0.0	N	0.956	14.7	2.00	0.213
	E	T1	1 Dominant	167	1.18	198	0.0	0.0	N	0.956	14.7	2.00	0.213

```
  Roundabout Capacity Model: SIDRA Standard
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for  ------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                               sec       ft     sec
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  W    T1    1 Dominant       2.00    0.196      Y       1.04     4.11    88.7     2.28
  N    R2    2 Excl. Slip     2.00    0.196      Y       1.10     4.35    93.8     2.41
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  E    L2    1 Dominant       2.00    0.567      Y       1.18     4.69   154.4     2.83
  W    R2    1 Dominant       2.00    0.567      Y       1.11     4.41   145.3     2.66
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  N    L2    1 Dominant       2.00    0.213      N       1.05     4.86   104.8     2.70
  E    T1    1 Dominant       2.00    0.213      N       1.02     4.72   101.8     2.62
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: SIDRA Standard
  Priority sharing means Follow-up Headway plus Intra-bunch Headway
  is larger than the Critical Gap.

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


CIRCULATING LANE FLOW RATES

---------------------------------------
  Lane          Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
---------------------------------------
  East: Greenbag Road (CR 857)
  1             171     179    100.0%
  Total         171     179
---------------------------------------
  North: Mississippi Avenue
  1             645     671    100.0%
  Total         645     671
---------------------------------------
  West: Greenbag Road (CR 857)
  1             167     198    100.0%
  Total         167     198
---------------------------------------
  The SIDRA Standard roundabout capacity model option is in use.
  This model takes into account the total circulating flow as well as the effect
  of flow distribution in circulating lanes on the entry capacity results.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  East: Greenbag Road (CR 857)
  1             0      645      645
  2           256        0      256
  Total       256      645      901
---------------------------------------
  North: Mississippi Avenue
  1           163      167      330
  Total       163      167      330
---------------------------------------
  West: Greenbag Road (CR 857)
  1           377      171      548
  Total       377      171      548
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	35.7	35.7	3322.9#	63.5#	406.1	406.1	11.4
	North	R2	35.5	35.5	3250.3#	62.4#	157.5	157.5	4.4
North: Mississippi Avenue									
	East	L2	24.1	23.3	3321.4#	97.2#	105.3	105.3	4.5
	West	R2	23.3	22.5	3321.4#	100.7#	102.4	102.4	4.6
West: Greenbag Road (CR 857)									
	North	L2	34.9	34.9	3345.3#	65.4#	108.3	108.3	3.1
	East	T1	34.9	34.9	3345.3#	65.3#	238.7	238.7	6.8
ALL VEHICLES:			33.2	32.1	3319.1#	70.5#	1118.3	1118.3	34.8

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	152.4	22.4	122.9	1600	488	NA
	North	R2	102.0	19.3	50.3	1600	488	NA
North: Mississippi Avenue								
	East	L2	50.0	14.7	196.3	1600	488	NA
	West	R2	99.6	19.1	50.3	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	50.0	14.7	196.3	1600	488	NA
	East	T1	152.4	22.4	122.9	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	Negn mph	Exit Speeds Negn mph	Cruise mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	22.4	22.4	40.0	35.0	4.3
16	R2	40.0	19.3	19.3	40.0	31.0	4.1
North: Mississippi Avenue							
7	L2	25.0	14.7	14.7	25.0	20.7	5.5
14	R2	25.0	19.1	19.1	25.0	20.7	1.4
West: Greenbag Road (CR 857)							
5	L2	40.0	14.7	14.7	40.0	31.2	9.6
2	T1	40.0	22.4	22.4	40.0	31.2	4.3

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn Mov Cl.	Arv	Opng Movement Adjust.	Total Cap.	Prac. Deg.	Prac. Spare	Deg. Satn

			Flow veh/h	Flow veh/h	Flow pcu/h	Satn veh/h	Satn xp	Cap. %	x
East: Greenbag Road (CR 857)									
6	T1	#	645	171	179	1325	0.85	75	0.487
16	R2	#	256	171	179	1243	0.85	313	0.206
North: Mississippi Avenue									
7	L2	#	167	645	671	319	0.85	62	0.526*
14	R2	#	163	645	671	310	0.85	62	0.526*
West: Greenbag Road (CR 857)									
5	L2	#	171	167	198	337	0.85	68	0.507
2	T1	#	377	167	198	743	0.85	68	0.507

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	0.97	1.16	5.4	0.51	329.3	16.06	406.1	11.4	35.7
16	R2	0.35	0.42	4.9	0.53	134.4	6.01	157.5	4.4	35.5
North: Mississippi Avenue										
7	L2	0.63	0.76	13.6	1.01	168.9	9.15	105.3	4.5	23.3
14	R2	0.40	0.48	8.9	1.01	164.2	8.78	102.4	4.6	22.5
West: Greenbag Road (CR 857)										
5	L2	0.53	0.64	11.2	0.61	103.8	7.14	108.3	3.1	34.9
2	T1	0.61	0.73	5.8	0.61	228.8	11.17	238.7	6.8	34.9

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	189.36	25.9	233.5	0.26	0.020	0.581
16	R2	73.56	7.7	70.0	0.08	0.006	0.219
		262.92	33.7	303.5	0.34	0.026	0.799
North: Mississippi Avenue							
7	L2	66.82	6.2	56.5	0.05	0.005	0.220
14	R2	65.95	8.1	74.1	0.05	0.005	0.312
		132.77	14.3	130.6	0.10	0.010	0.532
West: Greenbag Road (CR 857)							
5	L2	41.75	3.0	26.9	0.04	0.003	0.032
2	T1	91.96	6.5	57.9	0.08	0.005	0.066
		133.72	9.5	84.8	0.11	0.008	0.098
INTERSECTION:		529.41	57.4	518.9	0.56	0.044	1.429

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.29	15.7	357.2	0.40	0.031	0.889
16	R2	0.29	20.3	276.2	0.31	0.023	0.862
		0.29	16.7	334.6	0.37	0.028	0.881
North: Mississippi Avenue							
7	L2	0.39	17.0	333.4	0.28	0.030	1.297
14	R2	0.40	12.7	449.5	0.33	0.033	1.896
		0.40	14.6	390.6	0.30	0.031	1.592
West: Greenbag Road (CR 857)							
5	L2	0.24	36.1	154.4	0.21	0.015	0.182
2	T1	0.24	36.8	150.7	0.20	0.014	0.172
		0.24	36.6	151.9	0.21	0.014	0.175

```
 INTERSECTION:      0.29   19.5   288.3    0.31   0.025   0.794
----------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.  95% Back     Lane
 Lane                 Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         645  1325  0.487    5.4  0.51    3.9   99.8  1600.0
 2         256  1243  0.206    4.9  0.53    1.2   32.6   325.0
-------------------------------------------------------------------
 North: Mississippi Avenue
 1         330   628  0.526   11.3  1.01    4.2  116.9  1600.0
-------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         548  1080  0.507    7.5  0.61    4.1  105.7  1600.0
-------------------------------------------------------------------


LANE FLOW AND CAPACITY INFORMATION

-----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
-----------------------------------------
 East: Greenbag Road (CR 857)
 1        645     150  1325   0.487  100
 2        256     150  1243   0.206  100
-----------------------------------------
 North: Mississippi Avenue
 1        330     150   628   0.526  100
-----------------------------------------
 West: Greenbag Road (CR 857)
 1        548     150  1080   0.507  100
-----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout

-------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue    Length
        (veh/h)       Satf.    x     sec       ft       ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        645      4          0.487    5.4    100     1600
 2        256     10          0.206    4.9     33      325
        ---------------------------------------------------
          901      6          0.487    5.3    100
-------------------------------------------------------------
 North: Mississippi Avenue
 1        330     15          0.526   11.3    117     1600
        ---------------------------------------------------
          330     15          0.526   11.3    117
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        548      3          0.507    7.5    106     1600
        ---------------------------------------------------
          548      3          0.507    7.5    106
=============================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1779      6          0.526    7.1    117
=============================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

Lane No.	Satn Speed mph	Satn Flow veh/h	Satn Hdwy sec	Satn Spacing ft	Average Queue Space ft	Driver Response Time sec
East: Greenbag Road (CR 857)						
1	22.4	1580	2.28	75.02	25.80	1.49
2	19.3	1494	2.41	68.16	27.00	1.46
North: Mississippi Avenue						
1	16.9	1312	2.74	67.93	27.91	1.62
West: Greenbag Road (CR 857)						
1	20.0	1359	2.65	77.81	25.59	1.78

Saturation Flow and Saturation Headway are derived from follow-up headway.

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

LANE DELAYS

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Min Del dm	Delay (seconds/veh) Stop-line 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
East: Greenbag Road (CR 857)													
1	0.487	NA	NA	0.5	1.0	0.0	1.0	3.1	0.0	0.0	0.0	4.3	5.4
2	0.206	NA	NA	0.5	0.8	0.0	0.8	1.7	0.0	0.0	0.0	4.1	4.9
North: Mississippi Avenue													
1	0.526	NA	NA	3.6	5.9	1.9	7.8	3.4	4.4	1.0	3.3	3.5	11.3
West: Greenbag Road (CR 857)													
1	0.507	NA	NA	0.7	1.5	0.0	1.5	3.0	0.0	0.0	0.0	6.0	7.5

SIDRA Standard Delay Model is used. Control Delay is the sum of Stop-line Delay and Geometric Delay.
dm: Minimum delay for gap acceptance cases
dSL: Stop-line delay (=d1+d2)
dn: Average stop-start delay for all vehicles queued and unqueued
dq: Queuing delay (the part of the stop-line delay that includes stopped delay and queue move-up delay)
dqm: Queue move-up delay
di: Stopped delay (stopped (idling) time at near-zero speed)
dig: Geometric delay
dic: Control delay

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

BACK OF QUEUE (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.487	NA	NA	0.0	1.6	0.0	1.6	3.9	0.03	0.06	0.0	NA
2	0.206	NA	NA	0.0	0.5	0.0	0.5	1.2	0.04	0.10	0.0	NA
North: Mississippi Avenue												
1	0.526	NA	NA	0.2	1.4	0.2	1.7	4.2	0.03	0.07	0.0	NA
West: Greenbag Road (CR 857)												
1	0.507	NA	NA	0.0	1.7	0.0	1.7	4.1	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %

Lane No.	Satn x	During Green	Factor	Queue No	Nb1	Nb2	Nb	95%	Ratio Av.	95%	Block %	SL Ov. %
East: Greenbag Road (CR 857)												
1	0.487	NA	NA	0.0	40.1	0.0	40.1	99.8	0.03	0.06	0.0	NA
2	0.206	NA	NA	0.0	13.1	0.0	13.1	32.6	0.04	0.10	0.0	NA
North: Mississippi Avenue												
1	0.526	NA	NA	6.2	40.2	6.8	47.0	116.9	0.03	0.07	0.0	NA
West: Greenbag Road (CR 857)												
1	0.507	NA	NA	0.0	42.5	0.0	42.5	105.7	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.487	NA	NA	0.0	0.2	0.3
2	0.206	NA	NA	0.0	0.1	0.1
North: Mississippi Avenue						
1	0.526	NA	NA	0.2	0.7	1.3
West: Greenbag Road (CR 857)						
1	0.507	NA	NA	0.0	0.2	0.4

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.487	NA	NA	0.0	4.8	8.8
2	0.206	NA	NA	0.0	1.5	2.8
North: Mississippi Avenue						
1	0.526	NA	NA	6.2	20.0	36.3
West: Greenbag Road (CR 857)						
1	0.507	NA	NA	0.0	5.9	10.8

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.487	1.6	2.0	2.8	3.3	3.9	4.3	4.6
2	0.206	0.5	0.6	0.9	1.0	1.2	1.3	1.4
North: Mississippi Avenue								
1	0.526	1.7	2.2	3.1	3.6	4.2	4.6	5.0
West: Greenbag Road (CR 857)								
1	0.507	1.7	2.2	3.0	3.5	4.1	4.6	4.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.487	40.1	52.0	73.3	84.8	99.8	110.7	119.0
2	0.206	13.1	17.0	24.0	27.7	32.6	36.2	38.9
North: Mississippi Avenue								
1	0.526	47.0	60.9	85.9	99.4	116.9	129.8	139.5
West: Greenbag Road (CR 857)								

```
 1     0.507   42.5   55.1   77.6   89.9  105.7  117.3  126.1
------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
  HCM only gives Cycle-Average Queues for unsignalised intersections.
```

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout

-----------------------------------------------------------------------------------------------------------
                                                                                Queue    Total              Aver.
       Deg.  % Arv   Prog.   -- Effective Stop Rate --  Total  Move-up  Queue     Prop.   Num. of
 Lane   Satn  During  Factor                Geom. Overall  Stops   Rate    Move-ups  Queued  Cycles to
 No.      x   Green            he1   he2   hig     h       H      hqm       Hqm       pq      Depart
-----------------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1     0.487    NA      NA    0.31  0.00  0.21   0.51    329.3    0.00      0.0     0.50      0.50
 2     0.206    NA      NA    0.23  0.00  0.30   0.53    134.4    0.00      0.0     0.39      0.39
-----------------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1     0.526    NA      NA    0.85  0.10  0.06   1.01    333.2    0.18     58.8     0.85      1.03
-----------------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1     0.507    NA      NA    0.39  0.00  0.21   0.61    332.6    0.00      0.0     0.59      0.59
-----------------------------------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


TOTAL FLOW RATES for All Movement Classes (veh/h)

-------------------------------------------------
 From EAST To:                W       N
 Turn:                        T1      R2     TOT
 Flow Rate                 645.3   255.8   901.2
 %HV (all designations)      4.0    10.0     5.7
-------------------------------------------------
 From NORTH To:               E       W
 Turn:                        L2      R2     TOT
 Flow Rate                 167.4   162.8   330.2
 %HV (all designations)     18.0    11.0    14.5
-------------------------------------------------
 From WEST To:                N       E
 Turn:                        L2      T1     TOT
 Flow Rate                 170.9   376.7   547.7
 %HV (all designations)      5.0     2.0     2.9
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-----------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-----------------------------------------
 Flow Rate           619.5   230.2   849.8
 Mov Class %          96.0    90.0    94.3
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-----------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-----------------------------------------
 Flow Rate           137.3   144.9   282.2
 Mov Class %          82.0    89.0    85.5
 Flow Scale           1.00    1.00       -
```

Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	162.4	369.2	531.6
Mov Class %	95.0	98.0	97.1
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	25.8	25.6	51.4
Mov Class %	4.0	10.0	5.7
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	30.1	17.9	48.0
Mov Class %	18.0	11.0	14.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	8.5	7.5	16.1
Mov Class %	5.0	2.0	2.9
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

Site ID: AM
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	619.5	*	619.5
HV	25.8	*	25.8
Total	645.3	*	645.3
Lane 2			
LV	*	230.2	230.2
HV	*	25.6	25.6
Total	*	255.8	255.8
Approach	645.3	255.8	901.2

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	137.3	144.9	282.2
HV	30.1	17.9	48.0
Total	167.4	162.8	330.2
Approach	167.4	162.8	330.2

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	162.4	369.2	531.6
HV	8.5	7.5	16.1
Total	170.9	376.7	547.7
Approach	170.9	376.7	547.7

* Movement not allocated to the lane

EXIT LANE FLOW RATES

```
----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - AM Peak - WB Slip Ramp

```
Site ID: AM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   2.5%
  Number of Iterations: 6 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     3.0%   1.7%   0.9%

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:05:00 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\1 - Greenbag and Mississippi Options\Option 2 - Roundabout SIDRA\Greenbag & Mississippi Roundabout SIDRA - Single Lane.sip8

MOVEMENT SUMMARY

Site: PM [Greenbag & Mississippi - PM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	539	2.0	0.404	5.4	LOS A	2.9	72.6	0.47	0.51	0.47	35.8
16	R2	191	0.0	0.140	4.8	LOS A	0.8	19.6	0.37	0.52	0.37	35.7
Approach		730	1.5	0.404	5.2	LOS A	2.9	72.6	0.45	0.51	0.45	35.8
North: Mississippi Avenue												
7	L2	59	0.0	0.186	8.4	LOS A	1.1	27.3	0.64	0.67	0.64	24.6
14	R2	99	1.0	0.186	4.4	LOS A	1.1	27.3	0.64	0.67	0.64	23.7
Approach		158	0.6	0.186	5.9	LOS A	1.1	27.3	0.64	0.67	0.64	24.1
West: Greenbag Road (CR 857)												
5	L2	203	1.0	0.729	10.3	LOS B	10.0	252.3	0.51	0.48	0.51	35.3
2	T1	720	1.0	0.729	5.2	LOS A	10.0	252.3	0.51	0.48	0.51	35.3
Approach		924	1.0	0.729	6.3	LOS A	10.0	252.3	0.51	0.48	0.51	35.3
All Vehicles		1812	1.2	0.729	5.8	LOS A	10.0	252.3	0.50	0.51	0.50	34.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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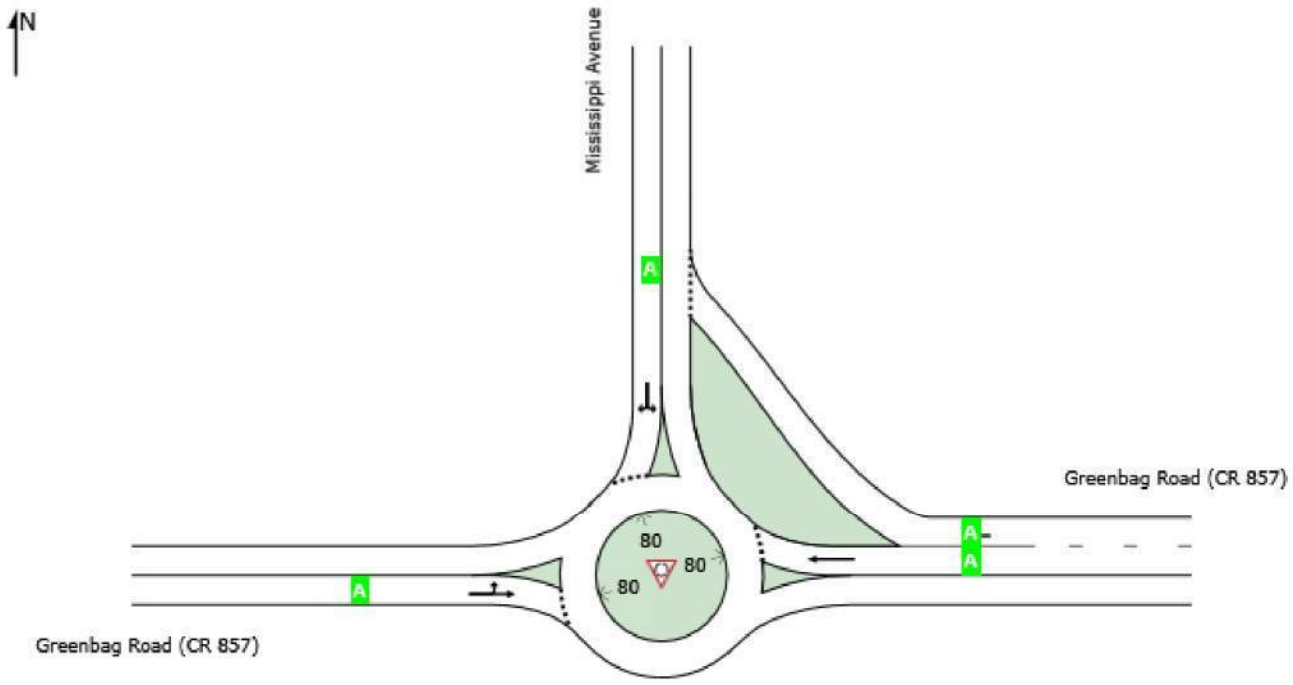
LANE LEVEL OF SERVICE

Lane Level of Service

Site: PM [Greenbag & Mississippi - PM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: PM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\1 - Greenbag and Mississippi Options\Option 2 - Roundabout SIDRA\Greenbag & Mississippi Roundabout SIDRA - Single Lane.sip8

QUEUE DISTANCE (%ILE)

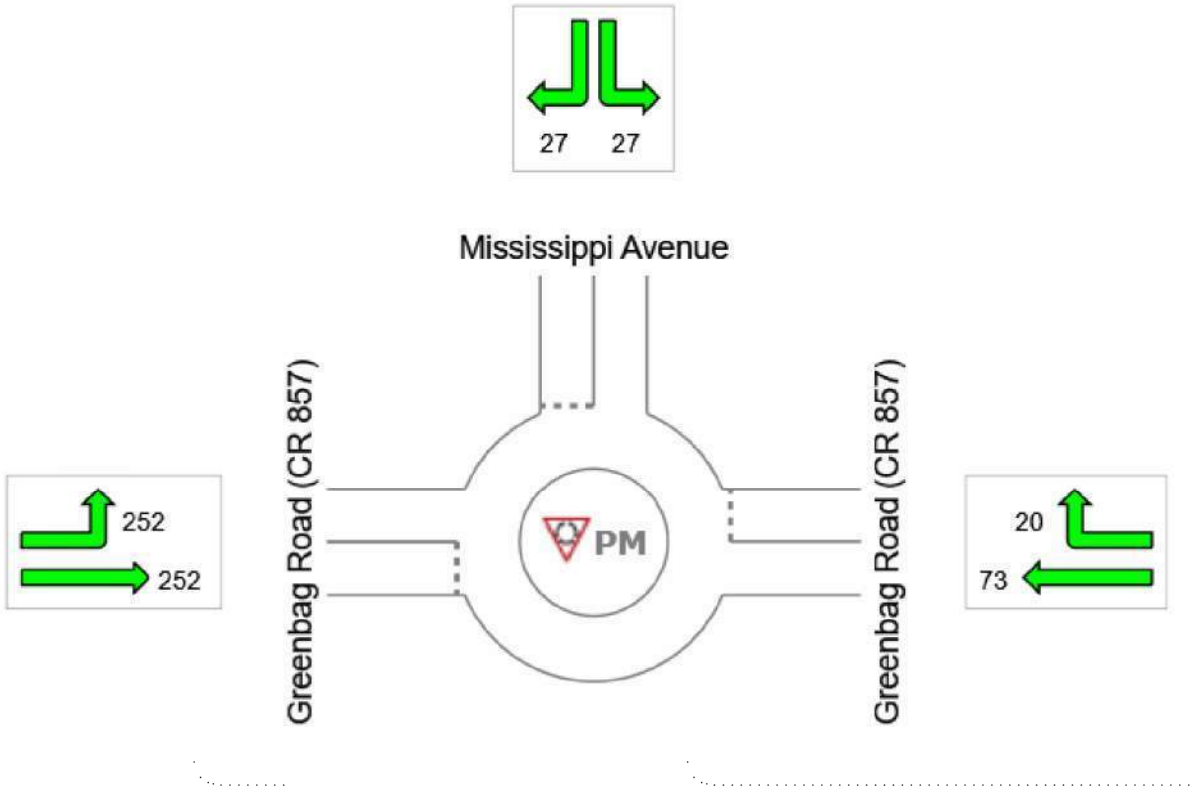
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: PM [Greenbag & Mississippi - PM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	73	27	252	252



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: PM [Greenbag & Mississippi - PM Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

Central Island Diam ft	Circ Width ft	Insc Diam. ft	Entry Radius ft	Entry Angle deg	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App Dist ft	Prop Queued Upstr Signal	Extra Bunching %
East: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	2	14.00	1600	NA	0.0N
North: Mississippi Avenue										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N
West: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	203	1.01	205	0.0	0.0	N	0.973	14.7	2.00	0.221
N	R2	2	Excl. Slip	203	1.01	205	0.0	0.0	N	0.973	14.7	2.00	0.221
North: Mississippi Avenue													
E	L2	1	Dominant	539	1.02	549	0.0	0.0	N	0.926	22.4	2.00	0.492
W	R2	1	Dominant	539	1.02	549	0.0	0.0	N	0.926	22.4	2.00	0.492
West: Greenbag Road (CR 857)													
N	L2	1	Dominant	59	1.00	59	0.0	0.0	N	0.988	14.7	2.00	0.070
E	T1	1	Dominant	59	1.00	59	0.0	0.0	N	0.988	14.7	2.00	0.070

```
  Roundabout Capacity Model: SIDRA Standard
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for  ------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                               sec       ft     sec
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  W    T1    1 Dominant       2.00    0.221      Y       1.02     3.99    86.2     2.22
  N    R2    2 Excl. Slip     2.00    0.221      Y       1.00     3.92    84.5     2.18
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  E    L2    1 Dominant       2.00    0.492      Y       1.00     4.13   135.9     2.44
  W    R2    1 Dominant       2.00    0.492      Y       1.01     4.17   137.2     2.47
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  N    L2    1 Dominant       2.00    0.070      N       1.01     4.90   105.6     2.65
  E    T1    1 Dominant       2.00    0.070      N       1.01     4.90   105.6     2.65
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: SIDRA Standard
  Priority sharing means Follow-up Headway plus Intra-bunch Headway
  is larger than the Critical Gap.

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


CIRCULATING LANE FLOW RATES

---------------------------------------
  Lane          Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
---------------------------------------
  East: Greenbag Road (CR 857)
  1             203     205    100.0%
  Total         203     205
---------------------------------------
  North: Mississippi Avenue
  1             539     549    100.0%
  Total         539     549
---------------------------------------
  West: Greenbag Road (CR 857)
  1              59      59    100.0%
  Total          59      59
---------------------------------------
  The SIDRA Standard roundabout capacity model option is in use.
  This model takes into account the total circulating flow as well as the effect
  of flow distribution in circulating lanes on the entry capacity results.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  East: Greenbag Road (CR 857)
  1             0      539      539
  2           191        0      191
  Total       191      539      730
---------------------------------------
  North: Mississippi Avenue
  1            99       59      158
  Total        99       59      158
---------------------------------------
  West: Greenbag Road (CR 857)
  1           720      204      924
  Total       720      204      924
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	35.8	35.8	3322.9#	63.2#	339.0	339.0	9.5
	North	R2	35.7	35.7	3250.3#	62.0#	117.8	117.8	3.3
North: Mississippi Avenue									
	East	L2	24.7	24.6	3305.3#	91.5#	37.0	37.0	1.5
	West	R2	23.8	23.7	3305.3#	95.0#	61.9	61.9	2.6
West: Greenbag Road (CR 857)									
	North	L2	35.3	35.3	3339.0#	64.4#	128.5	128.5	3.6
	East	T1	35.3	35.3	3339.0#	64.4#	455.6	455.6	12.9
ALL VEHICLES:			34.6	34.1	3321.9#	66.4#	1139.9	1139.9	33.4

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	152.4	22.4	122.9	1600	488	NA
	North	R2	102.0	19.3	50.3	1600	488	NA
North: Mississippi Avenue								
	East	L2	50.0	14.7	196.3	1600	488	NA
	West	R2	99.6	19.1	50.3	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	50.0	14.7	196.3	1600	488	NA
	East	T1	152.4	22.4	122.9	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	Negn mph	Exit Speeds Negn mph	Cruise mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	22.4	22.4	40.0	33.2	4.3
16	R2	40.0	19.3	19.3	40.0	31.0	4.1
North: Mississippi Avenue							
7	L2	25.0	14.7	14.7	25.0	21.9	5.4
14	R2	25.0	19.1	19.1	25.0	21.9	1.4
West: Greenbag Road (CR 857)							
5	L2	40.0	14.7	14.7	40.0	33.4	9.5
2	T1	40.0	22.4	22.4	40.0	33.4	4.3

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn Mov Cl.	Arv	Opng Movement Adjust.	Total Cap.	Prac. Deg.	Prac. Spare	Deg. Satn

			Flow veh/h	Flow veh/h	Flow pcu/h	Satn veh/h	Satn xp	Cap. %	x
East: Greenbag Road (CR 857)									
6	T1	#	539	203	205	1335	0.85	111	0.404
16	R2	#	191	203	205	1365	0.85	506	0.140
North: Mississippi Avenue									
7	L2	#	59	539	549	317	0.85	356	0.186
14	R2	#	99	539	549	531	0.85	356	0.186
West: Greenbag Road (CR 857)									
5	L2	#	203	59	59	279	0.85	17	0.729*
2	T1	#	720	59	59	988	0.85	17	0.729*

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	0.80	0.96	5.4	0.51	273.8	13.10	339.0	9.5	35.8
16	R2	0.25	0.30	4.8	0.52	99.0	4.06	117.8	3.3	35.7
North: Mississippi Avenue										
7	L2	0.14	0.17	8.4	0.67	39.3	2.28	37.0	1.5	24.6
14	R2	0.12	0.15	4.4	0.67	65.8	3.84	61.9	2.6	23.7
West: Greenbag Road (CR 857)										
5	L2	0.58	0.70	10.3	0.48	97.1	12.39	128.5	3.6	35.3
2	T1	1.03	1.24	5.2	0.48	344.2	22.39	455.6	12.9	35.3

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	149.08	19.4	173.7	0.21	0.016	0.276
16	R2	46.28	4.0	35.6	0.05	0.003	0.013
		195.36	23.4	209.3	0.26	0.019	0.289
North: Mississippi Avenue							
7	L2	18.16	1.3	11.4	0.01	0.001	0.006
14	R2	30.79	3.0	26.9	0.02	0.002	0.021
		48.95	4.3	38.3	0.03	0.003	0.027
West: Greenbag Road (CR 857)							
5	L2	46.69	3.2	28.4	0.04	0.003	0.017
2	T1	165.51	11.3	100.6	0.14	0.009	0.060
		212.20	14.5	128.9	0.18	0.012	0.077
INTERSECTION:		456.51	42.2	376.6	0.46	0.034	0.392

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.27	17.5	318.3	0.38	0.029	0.506
16	R2	0.24	29.4	187.8	0.26	0.017	0.066
		0.27	19.5	284.7	0.35	0.026	0.393
North: Mississippi Avenue							
7	L2	0.30	28.9	191.5	0.12	0.016	0.100
14	R2	0.31	20.5	270.3	0.19	0.022	0.208
		0.31	23.0	240.8	0.16	0.020	0.168
West: Greenbag Road (CR 857)							
5	L2	0.23	40.4	137.1	0.19	0.013	0.081
2	T1	0.23	40.4	137.1	0.19	0.013	0.081
		0.23	40.4	137.1	0.19	0.013	0.081

```
 INTERSECTION:      0.25   27.0   205.3    0.25   0.019   0.214
-------------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.  95% Back     Lane
 Lane                 Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         539  1335  0.404    5.4  0.51    2.9   72.6  1600.0
 2         191  1365  0.140    4.8  0.52    0.8   19.6   325.0
-------------------------------------------------------------------
 North: Mississippi Avenue
 1         158   848  0.186    5.9  0.67    1.1   27.3  1600.0
-------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         924  1266  0.729    6.3  0.48   10.0  252.3  1600.0
-------------------------------------------------------------------


LANE FLOW AND CAPACITY INFORMATION

-----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
-----------------------------------------
 East: Greenbag Road (CR 857)
 1        539     150  1335   0.404  100
 2        191     150  1365   0.140  100
-----------------------------------------
 North: Mississippi Avenue
 1        158     150   848   0.186  100
-----------------------------------------
 West: Greenbag Road (CR 857)
 1        924     150  1266   0.729  100
-----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout

-------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue    Length
        (veh/h)       Satf.    x     sec       ft      ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        539      2          0.404    5.4     73     1600
 2        191      0          0.140    4.8     20      325
        ---------------------------------------------------
          730      1          0.404    5.2     73
-------------------------------------------------------------
 North: Mississippi Avenue
 1        158      1          0.186    5.9     27     1600
        ---------------------------------------------------
          158      1          0.186    5.9     27
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        924      1          0.729    6.3    252     1600
        ---------------------------------------------------
          924      1          0.729    6.3    252
=============================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1812      1          0.729    5.8    252
=============================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

Lane No.	Satn Speed mph	Satn Flow veh/h	Satn Hdwy sec	Satn Spacing ft	Average Queue Space ft	Driver Response Time sec
East: Greenbag Road (CR 857)						
1	22.4	1618	2.22	73.25	25.40	1.45
2	19.3	1650	2.18	61.69	25.00	1.30
North: Mississippi Avenue						
1	17.5	1466	2.46	62.92	25.13	1.48
West: Greenbag Road (CR 857)						
1	20.7	1358	2.65	80.66	25.20	1.82

Saturation Flow and Saturation Headway are derived from follow-up headway.

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

LANE DELAYS

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Min Del dm	Delay (seconds/veh) Stop-line 1st d1	Stop-line 2nd d2	Stop-line Total dSL	Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
East: Greenbag Road (CR 857)													
1	0.404	NA	NA	0.6	1.0	0.0	1.0	2.9	0.0	0.0	0.0	4.3	5.4
2	0.140	NA	NA	0.5	0.7	0.0	0.7	1.6	0.0	0.0	0.0	4.1	4.8
North: Mississippi Avenue													
1	0.186	NA	NA	2.2	3.0	0.0	3.0	2.6	0.4	0.0	0.4	2.9	5.9
West: Greenbag Road (CR 857)													
1	0.729	NA	NA	0.2	0.8	0.0	0.8	2.8	0.0	0.0	0.0	5.5	6.3

SIDRA Standard Delay Model is used. Control Delay is the sum of Stop-line Delay and Geometric Delay.
dm: Minimum delay for gap acceptance cases
dSL: Stop-line delay (=d1+d2)
dn: Average stop-start delay for all vehicles queued and unqueued
dq: Queuing delay (the part of the stop-line delay that includes stopped delay and queue move-up delay)
dqm: Queue move-up delay
di: Stopped delay (stopped (idling) time at near-zero speed)
dig: Geometric delay
dic: Control delay

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

BACK OF QUEUE (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.404	NA	NA	0.0	1.1	0.0	1.1	2.9	0.02	0.05	0.0	NA
2	0.140	NA	NA	0.0	0.3	0.0	0.3	0.8	0.02	0.06	0.0	NA
North: Mississippi Avenue												
1	0.186	NA	NA	0.0	0.4	0.0	0.4	1.1	0.01	0.02	0.0	NA
West: Greenbag Road (CR 857)												
1	0.729	NA	NA	0.0	4.0	0.0	4.0	10.0	0.06	0.16	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %

Lane No.	Satn x	During Green	Factor	Queue No	Nb1	Nb2	Nb	95%	Ratio Av.	95%	Block %	SL Ov. %
East: Greenbag Road (CR 857)												
1	0.404	NA	NA	0.0	29.2	0.0	29.2	72.6	0.02	0.05	0.0	NA
2	0.140	NA	NA	0.0	7.9	0.0	7.9	19.6	0.02	0.06	0.0	NA
North: Mississippi Avenue												
1	0.186	NA	NA	0.0	11.0	0.0	11.0	27.3	0.01	0.02	0.0	NA
West: Greenbag Road (CR 857)												
1	0.729	NA	NA	0.0	101.5	0.0	101.5	252.3	0.06	0.16	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.404	NA	NA	0.0	0.2	0.3
2	0.140	NA	NA	0.0	0.0	0.1
North: Mississippi Avenue						
1	0.186	NA	NA	0.0	0.1	0.2
West: Greenbag Road (CR 857)						
1	0.729	NA	NA	0.0	0.2	0.4

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.404	NA	NA	0.0	3.9	7.1
2	0.140	NA	NA	0.0	1.0	1.7
North: Mississippi Avenue						
1	0.186	NA	NA	0.0	3.3	6.0
West: Greenbag Road (CR 857)						
1	0.729	NA	NA	0.0	5.3	9.6

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.404	1.1	1.5	2.1	2.4	2.9	3.2	3.4
2	0.140	0.3	0.4	0.6	0.7	0.8	0.9	0.9
North: Mississippi Avenue								
1	0.186	0.4	0.6	0.8	0.9	1.1	1.2	1.3
West: Greenbag Road (CR 857)								
1	0.729	4.0	5.2	7.4	8.5	10.0	11.1	11.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.404	29.2	37.8	53.3	61.7	72.6	80.6	86.6
2	0.140	7.9	10.2	14.4	16.7	19.6	21.7	23.4
North: Mississippi Avenue								
1	0.186	11.0	14.2	20.1	23.2	27.3	30.3	32.6
West: Greenbag Road (CR 857)								

```
 1     0.729  101.5  131.4  185.3  214.5  252.3  280.0  301.0
-------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
  HCM only gives Cycle-Average Queues for unsignalised intersections.
```

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout

-----------------------------------------------------------------------------------------------------------
                                                                    Queue    Total              Aver.
       Deg.  % Arv   Prog.   -- Effective Stop Rate --  Total  Move-up   Queue     Prop.   Num. of
 Lane   Satn  During  Factor                Geom. Overall  Stops   Rate    Move-ups  Queued  Cycles to
 No.      x   Green            he1   he2   hig     h       H     hqm       Hqm       pq      Depart
-----------------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1     0.404    NA      NA    0.29  0.00  0.22   0.51    273.8    0.00      0.0     0.47      0.47
 2     0.140    NA      NA    0.21  0.00  0.30   0.52     99.0    0.00      0.0     0.37      0.37
-----------------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1     0.186    NA      NA    0.53  0.00  0.13   0.67    105.1    0.00      0.0     0.64      0.64
-----------------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1     0.729    NA      NA    0.24  0.00  0.24   0.48    441.3    0.00      0.0     0.51      0.51
-----------------------------------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


TOTAL FLOW RATES for All Movement Classes (veh/h)

-------------------------------------------------
 From EAST To:                W       N
 Turn:                        T1      R2     TOT
 Flow Rate                 538.7   191.4   730.1
 %HV (all designations)      2.0     0.0     1.5
-------------------------------------------------
 From NORTH To:               E       W
 Turn:                        L2      R2     TOT
 Flow Rate                 59.1    98.9   158.1
 %HV (all designations)      0.0     1.0     0.6
-------------------------------------------------
 From WEST To:                N       E
 Turn:                        L2      T1     TOT
 Flow Rate                203.2   720.4   923.7
 %HV (all designations)      1.0     1.0     1.0
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate           527.9   191.4   719.3
 Mov Class %          98.0   100.0    98.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate            59.1    97.9   157.1
 Mov Class %         100.0    99.0    99.4
 Flow Scale           1.00    1.00       -
```

Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	201.2	713.2	914.4
Mov Class %	99.0	99.0	99.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	10.8	0.0	10.8
Mov Class %	2.0	0.0	1.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	0.0	1.0	1.0
Mov Class %	0.0	1.0	0.6
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	2.0	7.2	9.2
Mov Class %	1.0	1.0	1.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

Site ID: PM
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	527.9	*	527.9
HV	10.8	*	10.8
Total	538.7	*	538.7
Lane 2			
LV	*	191.4	191.4
Total	*	191.4	191.4
Approach	538.7	191.4	730.1

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	59.1	97.9	157.1
HV	*	1.0	1.0
Total	59.1	98.9	158.1
Approach	59.1	98.9	158.1

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	201.2	713.2	914.4
HV	2.0	7.2	9.2
Total	203.2	720.4	923.7
Approach	203.2	720.4	923.7

* Movement not allocated to the lane

EXIT LANE FLOW RATES

```
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - PM Peak - WB Slip Ramp

```
Site ID: PM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   1.7%
  Number of Iterations: 6 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     2.1%   1.1%   0.6%

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:05:29 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\1 - Greenbag and Mississippi Options\Option 2 - Roundabout SIDRA\Greenbag & Mississippi Roundabout SIDRA - Single Lane.sip8

MOVEMENT SUMMARY

Site: SAT [Greenbag & Mississippi - SAT Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: SAT Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	367	2.0	0.243	4.5	LOS A	1.4	34.3	0.18	0.40	0.18	36.9
16	R2	43	0.0	0.028	4.2	LOS A	0.1	3.1	0.14	0.46	0.14	36.3
Approach		410	1.8	0.243	4.5	LOS A	1.4	34.3	0.17	0.41	0.17	36.8
North: Mississippi Avenue												
7	L2	30	0.0	0.067	7.1	LOS A	0.3	8.1	0.46	0.53	0.46	24.9
14	R2	38	0.0	0.067	3.1	LOS A	0.3	8.1	0.46	0.53	0.46	24.0
Approach		68	0.0	0.067	4.8	LOS A	0.3	8.1	0.46	0.53	0.46	24.4
West: Greenbag Road (CR 857)												
5	L2	49	3.0	0.416	9.8	LOS A	3.1	78.7	0.19	0.42	0.19	36.6
2	T1	495	1.0	0.416	4.6	LOS A	3.1	78.7	0.19	0.42	0.19	36.7
Approach		544	1.2	0.416	5.0	LOS A	3.1	78.7	0.19	0.42	0.19	36.7
All Vehicles		1021	1.3	0.416	4.8	LOS A	3.1	78.7	0.20	0.42	0.20	35.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

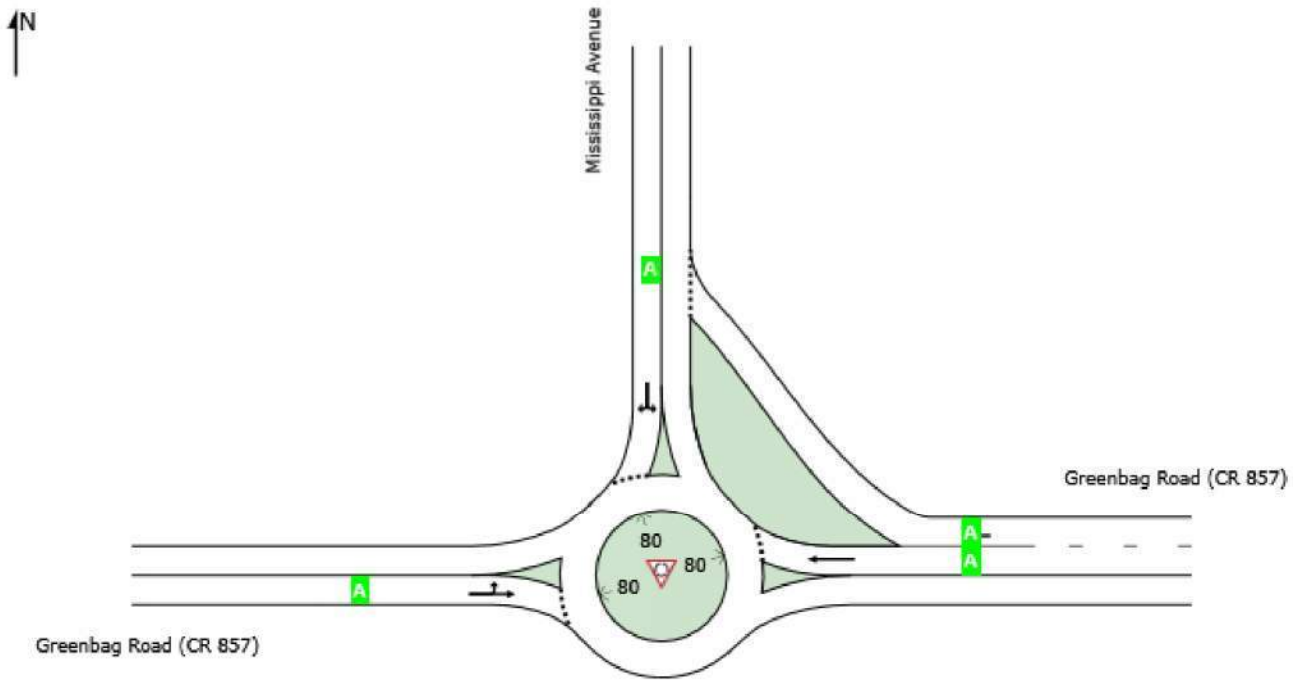
LANE LEVEL OF SERVICE

Lane Level of Service

Site: SAT [Greenbag & Mississippi - SAT Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: SAT Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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QUEUE DISTANCE (%ILE)

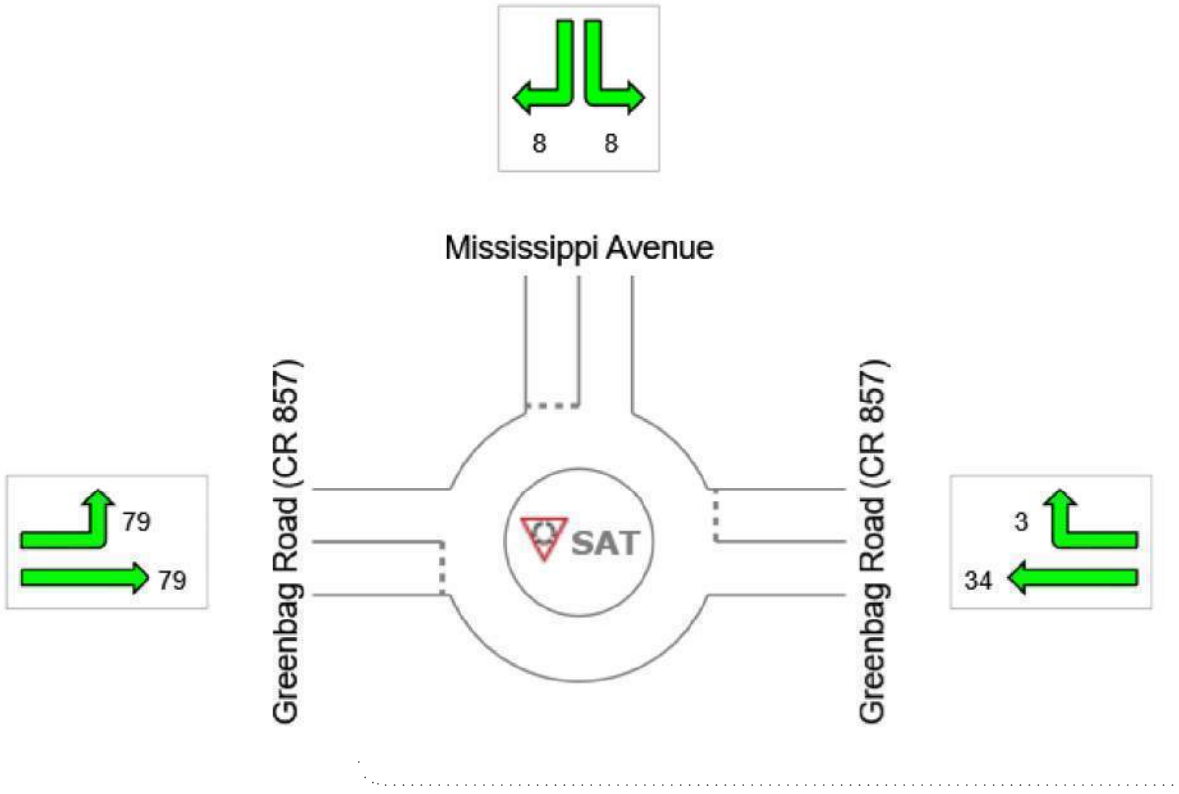
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: SAT [Greenbag & Mississippi - SAT Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: SAT Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	34	8	79	79



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: SAT [Greenbag & Mississippi - SAT Peak - WB Slip Ramp]

Roundabout - Single Lane
Site Category: SAT Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
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- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
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Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	2	14.00	1600	NA	0.0N
North: Mississippi Avenue										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N
West: Greenbag Road (CR 857)										
80.0	25.0	130.0	65.0	30.0	1	1	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	49	1.03	50	0.0	0.0	N	0.997	14.7	2.00	0.060
N	R2	2	Excl. Slip	49	1.03	50	0.0	0.0	N	0.997	14.7	2.00	0.060
North: Mississippi Avenue													
E	L2	1	Dominant	367	1.02	374	0.0	0.0	N	0.984	22.4	2.00	0.366
W	R2	1	Dominant	367	1.02	374	0.0	0.0	N	0.984	22.4	2.00	0.366
West: Greenbag Road (CR 857)													
N	L2	1	Dominant	30	1.00	30	0.0	0.0	N	0.995	14.7	2.00	0.036
E	T1	1	Dominant	30	1.00	30	0.0	0.0	N	0.995	14.7	2.00	0.036

```
  Roundabout Capacity Model: SIDRA Standard
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for  ------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                               sec       ft     sec
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  W    T1    1 Dominant       2.00    0.060      Y       1.02     4.23    91.2     2.28
  N    R2    2 Excl. Slip     2.00    0.060      Y       1.00     4.14    89.4     2.24
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  E    L2    1 Dominant       2.00    0.366      Y       1.00     4.36   143.7     2.51
  W    R2    1 Dominant       2.00    0.366      Y       1.00     4.36   143.7     2.51
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Environment Factor: 1.05
Entry/Circ. Flow Adjustment: None
  N    L2    1 Dominant       2.00    0.036      N       1.03     5.04   108.8     2.71
  E    T1    1 Dominant       2.00    0.036      N       1.01     4.95   106.7     2.66
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: SIDRA Standard
  Priority sharing means Follow-up Headway plus Intra-bunch Headway
  is larger than the Critical Gap.

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane          Circulating Flow Rate
  No.          veh/h   pcu/h   Percent
----------------------------------------
  East: Greenbag Road (CR 857)
  1              49      50    100.0%
  Total          49      50
----------------------------------------
  North: Mississippi Avenue
  1             367     374    100.0%
  Total         367     374
----------------------------------------
  West: Greenbag Road (CR 857)
  1              30      30    100.0%
  Total          30      30
----------------------------------------
  The SIDRA Standard roundabout capacity model option is in use.
  This model takes into account the total circulating flow as well as the effect
  of flow distribution in circulating lanes on the entry capacity results.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  East: Greenbag Road (CR 857)
  1             0      367      367
  2            43        0       43
  Total        43      367      410
---------------------------------------
  North: Mississippi Avenue
  1            38       30       68
  Total        38       30       68
---------------------------------------
  West: Greenbag Road (CR 857)
  1           495       49      544
  Total       495       49      544
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	36.9	36.9	3322.9#	61.4#	231.0	231.0	6.3
	North	R2	36.3	36.3	3250.3#	61.0#	26.2	26.2	0.7
North: Mississippi Avenue									
	East	L2	24.9	24.9	3314.2#	90.8#	18.7	18.7	0.8
	West	R2	24.0	24.0	3314.2#	94.3#	24.0	24.0	1.0
West: Greenbag Road (CR 857)									
	North	L2	36.6	36.6	3329.4#	62.0#	30.9	30.9	0.8
	East	T1	36.7	36.7	3329.4#	61.9#	311.9	311.9	8.5
ALL VEHICLES:			35.9	35.5	3322.7#	63.8#	642.7	642.7	18.1

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	152.4	22.4	122.9	1600	488	NA
	North	R2	102.0	19.3	50.3	1600	488	NA
North: Mississippi Avenue								
	East	L2	50.0	14.7	196.3	1600	488	NA
	West	R2	99.6	19.1	50.3	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	50.0	14.7	196.3	1600	488	NA
	East	T1	152.4	22.4	122.9	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	Negn mph	Exit Speeds Negn mph	Cruise mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	22.4	22.4	40.0	36.1	4.3
16	R2	40.0	19.3	19.3	40.0	31.0	4.1
North: Mississippi Avenue							
7	L2	25.0	14.7	14.7	25.0	24.6	5.4
14	R2	25.0	19.1	19.1	25.0	24.6	1.4
West: Greenbag Road (CR 857)							
5	L2	40.0	14.7	14.7	40.0	35.0	9.6
2	T1	40.0	22.4	22.4	40.0	35.0	4.3

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn Mov Cl.	Arv	Opng Movement Adjust.	Total Cap.	Prac. Deg.	Prac. Spare	Deg. Satn

			Flow veh/h	Flow veh/h	Flow pcu/h	veh/h	Satn xp	Cap. %	x
East: Greenbag Road (CR 857)									
6	T1	#	367	49	50	1507	0.85	249	0.243
16	R2	#	43	49	50	1539	0.85	2974	0.028
North: Mississippi Avenue									
7	L2	#	30	367	374	448	0.85	1178	0.067
14	R2	#	38	367	374	576	0.85	1178	0.067
West: Greenbag Road (CR 857)									
5	L2	#	49	30	30	118	0.85	104	0.416*
2	T1	#	495	30	30	1190	0.85	104	0.416*

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	0.46	0.56	4.5	0.40	148.1	8.15	231.0	6.3	36.9
16	R2	0.05	0.06	4.2	0.46	19.5	0.86	26.2	0.7	36.3
North: Mississippi Avenue										
7	L2	0.06	0.07	7.1	0.53	15.7	1.02	18.7	0.8	24.9
14	R2	0.03	0.04	3.1	0.53	20.1	1.24	24.0	1.0	24.0
West: Greenbag Road (CR 857)										
5	L2	0.13	0.16	9.8	0.42	20.8	3.53	30.9	0.8	36.6
2	T1	0.63	0.75	4.6	0.42	209.9	12.10	311.9	8.5	36.7

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	97.84	13.0	116.1	0.14	0.011	0.184
16	R2	9.96	0.9	7.8	0.01	0.001	0.003
		107.80	13.8	123.9	0.15	0.011	0.187
North: Mississippi Avenue							
7	L2	8.89	0.6	5.5	0.00	0.000	0.002
14	R2	11.58	1.1	9.9	0.01	0.001	0.004
		20.46	1.7	15.4	0.01	0.001	0.005
West: Greenbag Road (CR 857)							
5	L2	10.33	0.7	6.5	0.01	0.001	0.004
2	T1	104.38	7.2	64.0	0.09	0.006	0.040
		114.71	7.9	70.4	0.10	0.007	0.044
INTERSECTION:		242.97	23.5	209.7	0.26	0.019	0.236

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.26	17.8	312.4	0.38	0.029	0.495
16	R2	0.24	30.0	184.5	0.26	0.017	0.065
		0.26	18.6	299.3	0.37	0.027	0.451
North: Mississippi Avenue							
7	L2	0.30	30.2	183.2	0.11	0.015	0.051
14	R2	0.30	21.7	254.8	0.18	0.021	0.093
		0.30	24.7	223.5	0.15	0.018	0.075
West: Greenbag Road (CR 857)							
5	L2	0.21	42.8	129.9	0.18	0.012	0.086
2	T1	0.21	43.5	127.5	0.18	0.012	0.079
		0.21	43.4	127.7	0.18	0.012	0.080

```
 INTERSECTION:      0.23   27.4   202.7    0.25   0.018   0.228
----------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.  95% Back     Lane
 Lane                 Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         367  1507  0.243    4.5  0.40    1.4   34.3  1600.0
 2          43  1539  0.028    4.2  0.46    0.1    3.1   325.0
-------------------------------------------------------------------
 North: Mississippi Avenue
 1          68  1024  0.067    4.8  0.53    0.3    8.1  1600.0
-------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         544  1307  0.416    5.0  0.42    3.1   78.7  1600.0
-------------------------------------------------------------------


LANE FLOW AND CAPACITY INFORMATION

-----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
-----------------------------------------
 East: Greenbag Road (CR 857)
 1        367     150  1507   0.243  100
 2         43      43  1539   0.028  100
-----------------------------------------
 North: Mississippi Avenue
 1         68      68  1024   0.067  100
-----------------------------------------
 West: Greenbag Road (CR 857)
 1        544     150  1307   0.416  100
-----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout

------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue    Length
        (veh/h)       Satf.    x     sec       ft      ft
------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        367      2          0.243    4.5     34     1600
 2         43      0          0.028    4.2      3      325
        ---------------------------------------------------
          410      2          0.243    4.5     34
------------------------------------------------------------
 North: Mississippi Avenue
 1         68      0          0.067    4.8      8     1600
        ---------------------------------------------------
           68      0          0.067    4.8      8
------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        544      1          0.416    5.0     79     1600
        ---------------------------------------------------
          544      1          0.416    5.0     79
============================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1021      1          0.416    4.8     79
============================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

Lane No.	Satn Speed mph	Satn Flow veh/h	Satn Hdwy sec	Satn Spacing ft	Average Queue Space ft	Driver Response Time sec
East: Greenbag Road (CR 857)						
1	22.4	1576	2.28	75.20	25.40	1.51
2	19.3	1608	2.24	63.33	25.00	1.36
North: Mississippi Avenue						
1	17.2	1436	2.51	63.18	25.00	1.51
West: Greenbag Road (CR 857)						
1	21.8	1350	2.67	85.07	25.24	1.88

Saturation Flow and Saturation Headway are derived from follow-up headway.

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

LANE DELAYS

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Min Del dm	Delay (seconds/veh) Stop-line 1st d1	Stop-line 2nd d2	Stop-line Total dSL	Acc. Dec. dn	Queuing Total dq	Queuing MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
East: Greenbag Road (CR 857)													
1	0.243	NA	NA	0.1	0.2	0.0	0.2	1.1	0.0	0.0	0.0	4.3	4.5
2	0.028	NA	NA	0.1	0.1	0.0	0.1	0.6	0.0	0.0	0.0	4.1	4.2
North: Mississippi Avenue													
1	0.067	NA	NA	1.4	1.7	0.0	1.7	1.9	0.0	0.0	0.0	3.2	4.8
West: Greenbag Road (CR 857)													
1	0.416	NA	NA	0.1	0.2	0.0	0.2	1.1	0.0	0.0	0.0	4.8	5.0

SIDRA Standard Delay Model is used. Control Delay is the sum of Stop-line Delay and Geometric Delay.
dm: Minimum delay for gap acceptance cases
dSL: Stop-line delay (=d1+d2)
dn: Average stop-start delay for all vehicles queued and unqueued
dq: Queuing delay (the part of the stop-line delay that includes stopped delay and queue move-up delay)
dqm: Queue move-up delay
di: Stopped delay (stopped (idling) time at near-zero speed)
dig: Geometric delay
dic: Control delay

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

BACK OF QUEUE (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.243	NA	NA	0.0	0.5	0.0	0.5	1.4	0.01	0.02	0.0	NA
2	0.028	NA	NA	0.0	0.1	0.0	0.1	0.1	0.00	0.01	0.0	NA
North: Mississippi Avenue												
1	0.067	NA	NA	0.0	0.1	0.0	0.1	0.3	0.00	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.416	NA	NA	0.0	1.3	0.0	1.3	3.1	0.02	0.05	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane	Deg. Satn	% Arv During	Prog. Factor	Ovrfl. Queue	Back of Queue (ft)	Queue Stor.	Prob. Block	Prob.

Lane No.	Satn x	During Green	Factor	Queue No	Nb1	Nb2	Nb	95%	Ratio Av.	95%	Block %	SL Ov. %
East: Greenbag Road (CR 857)												
1	0.243	NA	NA	0.0	13.8	0.0	13.8	34.3	0.01	0.02	0.0	NA
2	0.028	NA	NA	0.0	1.3	0.0	1.3	3.1	0.00	0.01	0.0	NA
North: Mississippi Avenue												
1	0.067	NA	NA	0.0	3.3	0.0	3.3	8.1	0.00	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.416	NA	NA	0.0	31.7	0.0	31.7	78.7	0.02	0.05	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.243	NA	NA	0.0	0.0	0.0
2	0.028	NA	NA	0.0	0.0	0.0
North: Mississippi Avenue						
1	0.067	NA	NA	0.0	0.0	0.1
West: Greenbag Road (CR 857)						
1	0.416	NA	NA	0.0	0.0	0.1

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.243	NA	NA	0.0	0.5	1.0
2	0.028	NA	NA	0.0	0.0	0.1
North: Mississippi Avenue						
1	0.067	NA	NA	0.0	0.8	1.4
West: Greenbag Road (CR 857)						
1	0.416	NA	NA	0.0	0.8	1.5

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.243	0.5	0.7	1.0	1.1	1.4	1.5	1.6
2	0.028	0.1	0.1	0.1	0.1	0.1	0.1	0.1
North: Mississippi Avenue								
1	0.067	0.1	0.2	0.2	0.3	0.3	0.4	0.4
West: Greenbag Road (CR 857)								
1	0.416	1.3	1.6	2.3	2.7	3.1	3.5	3.7

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.243	13.8	17.9	25.2	29.2	34.3	38.1	40.9
2	0.028	1.3	1.6	2.3	2.7	3.1	3.5	3.7
North: Mississippi Avenue								
1	0.067	3.3	4.2	5.9	6.9	8.1	9.0	9.7
West: Greenbag Road (CR 857)								

```
 1     0.416   31.6   41.0   57.8   66.9   78.7   87.3   93.9
--------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
  HCM only gives Cycle-Average Queues for unsignalised intersections.
```

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout

-------------------------------------------------------------------------------------------------------
                                                                    Queue    Total              Aver.
       Deg.  % Arv   Prog.   -- Effective Stop Rate --  Total    Move-up    Queue     Prop.   Num. of
 Lane  Satn  During  Factor                Geom. Overall Stops     Rate    Move-ups  Queued  Cycles to
 No.     x   Green             he1   he2   hig     h      H       hqm       Hqm       pq      Depart
-------------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1     0.243    NA      NA    0.07  0.00  0.34   0.40    148.1    0.00      0.0     0.18      0.18
 2     0.028    NA      NA    0.04  0.00  0.42   0.46     19.5    0.00      0.0     0.14      0.14
-------------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1     0.067    NA      NA    0.31  0.00  0.21   0.53     35.8    0.00      0.0     0.46      0.46
-------------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1     0.416    NA      NA    0.07  0.00  0.36   0.42    230.7    0.00      0.0     0.19      0.19
-------------------------------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout


TOTAL FLOW RATES for All Movement Classes (veh/h)

-----------------------------------------------------
 From EAST To:                  W       N
 Turn:                         T1      R2     TOT
 Flow Rate                  367.0    42.6   409.6
 %HV (all designations)       2.0     0.0     1.8
-----------------------------------------------------
 From NORTH To:                 E       W
 Turn:                         L2      R2     TOT
 Flow Rate                  29.8    38.3    68.1
 %HV (all designations)       0.0     0.0     0.0
-----------------------------------------------------
 From WEST To:                  N       E
 Turn:                         L2      T1     TOT
 Flow Rate                  48.9   494.7   543.6
 %HV (all designations)       3.0     1.0     1.2
-----------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                 T1      R2     TOT
-------------------------------------------
 Flow Rate          359.7    42.6   402.2
 Mov Class %         98.0   100.0    98.2
 Flow Scale          1.00    1.00       -
 Peak Flow Factor    0.94    0.94       -
 Residual Demand      0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                 L2      R2     TOT
-------------------------------------------
 Flow Rate           29.8    38.3    68.1
 Mov Class %        100.0   100.0   100.0
 Flow Scale          1.00    1.00       -
```

Peak Flow Factor	0.94	0.94	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	47.5	489.7	537.2
Mov Class %	97.0	99.0	98.8
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.94	0.94	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	7.3	0.0	7.3
Mov Class %	2.0	0.0	1.8
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.94	0.94	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	0.0	0.0	0.0
Mov Class %	0.0	0.0	0.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.94	0.94	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	1.5	4.9	6.4
Mov Class %	3.0	1.0	1.2
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.94	0.94	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

Site ID: SAT
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	359.7	*	359.7
HV	7.3	*	7.3
Total	367.0	*	367.0
Lane 2			
LV	*	42.6	42.6
Total	*	42.6	42.6
Approach	367.0	42.6	409.6

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	29.8	38.3	68.1
Total	29.8	38.3	68.1
Approach	29.8	38.3	68.1

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	47.5	489.7	537.2
HV	1.5	4.9	6.4
Total	48.9	494.7	543.6
Approach	48.9	494.7	543.6

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT

```
-----------------------------------------
 Exit: EAST
Lane:  1           519.5     4.9   524.5
Total              519.5     4.9   524.5
-----------------------------------------
 Exit: NORTH
Lane:  1            90.0     1.5    91.5
Total               90.0     1.5    91.5
-----------------------------------------
 Exit: WEST
Lane:  1           398.0     7.3   405.3
Total              398.0     7.3   405.3
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           519.5     4.9   524.5
Total              519.5     4.9   524.5
-----------------------------------------
 Exit: NORTH
Lane:  1            90.0     1.5    91.5
Total               90.0     1.5    91.5
-----------------------------------------
 Exit: WEST
Lane:  1           398.0     7.3   405.3
Total              398.0     7.3   405.3
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag & Mississippi - SAT Peak - WB Slip Ramp

```
Site ID: SAT
Roundabout

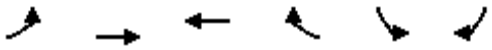

Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.8%
  Number of Iterations: 3 (Maximum: 10)

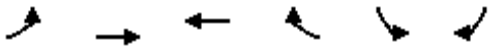
Other Diagnostic Messages (if any):
```

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SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:11:05 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\1 - Greenbag and Mississippi Options\Option 2 - Roundabout SIDRA\Greenbag & Mississippi Roundabout SIDRA - Single Lane.sip8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1828	1748	1405	1464	1392
Flt Permitted	0.182				0.950	
Satd. Flow (perm)	323	1828	1748	1405	1464	1392
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				256		163
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	377	645	256	167	163
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

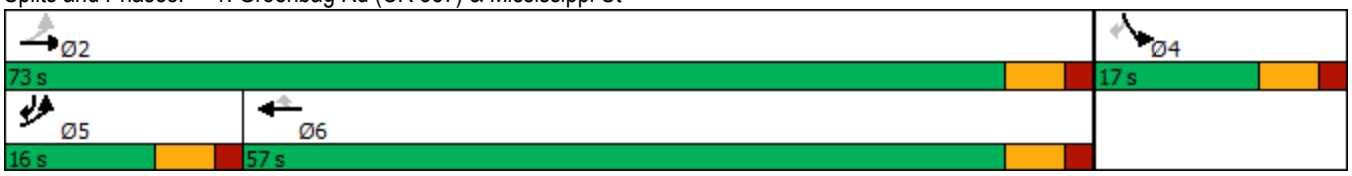


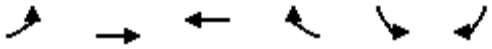
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	24.0	16.0	16.0
Total Split (s)	16.0	73.0	57.0	57.0	17.0	16.0
Total Split (%)	17.8%	81.1%	63.3%	63.3%	18.9%	17.8%
Maximum Green (s)	10.0	67.0	51.0	51.0	11.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	None
Act Effct Green (s)	47.7	47.7	32.1	32.1	11.3	26.9
Actuated g/C Ratio	0.67	0.67	0.45	0.45	0.16	0.38
v/c Ratio	0.43	0.31	0.82	0.33	0.72	0.26
Control Delay	7.3	5.3	26.1	2.6	52.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	5.3	26.1	2.6	52.4	5.1
LOS	A	A	C	A	D	A
Approach Delay		5.9	19.4		29.1	
Approach LOS		A	B		C	
Queue Length 50th (ft)	23	56	235	0	70	0
Queue Length 95th (ft)	37	81	325	27	#200	38
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	412	1671	1281	1098	231	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.23	0.50	0.23	0.72	0.26

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 71.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

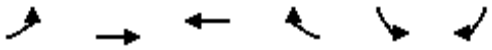




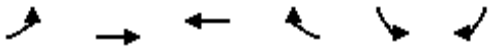
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	324	555	220	144	140
Future Volume (veh/h)	147	324	555	220	144	140
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1837	1891	1809	1710	1594	1695
Adj Flow Rate, veh/h	171	377	645	256	167	163
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	2	4	10	18	11
Cap, veh/h	359	1202	803	646	224	333
Arrive On Green	0.08	0.64	0.44	0.44	0.15	0.15
Sat Flow, veh/h	1749	1891	1809	1454	1518	1440
Grp Volume(v), veh/h	171	377	645	256	167	163
Grp Sat Flow(s),veh/h/ln	1749	1891	1809	1454	1518	1440
Q Serve(g_s), s	2.6	5.0	17.1	6.6	5.8	5.4
Cycle Q Clear(g_c), s	2.6	5.0	17.1	6.6	5.8	5.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	359	1202	803	646	224	333
V/C Ratio(X)	0.48	0.31	0.80	0.40	0.74	0.49
Avail Cap(c_a), veh/h	528	2283	1662	1336	301	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.4	4.6	13.3	10.4	22.6	18.5
Incr Delay (d2), s/veh	1.0	0.1	1.9	0.4	6.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.6	8.9	2.7	2.9	4.5
LnGrp Delay(d),s/veh	11.4	4.7	15.3	10.8	29.3	19.6
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h		548	901		330	
Approach Delay, s/veh		6.8	14.0		24.5	
Approach LOS		A	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.3		14.2	10.6	30.6		
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		
Max Green Setting (Gmax), s		67.0		11.0	10.0	51.0		
Max Q Clear Time (g_c+I1), s		7.0		7.8	4.6	19.1		
Green Ext Time (p_c), s		2.3		0.4	0.2	5.6		

Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B



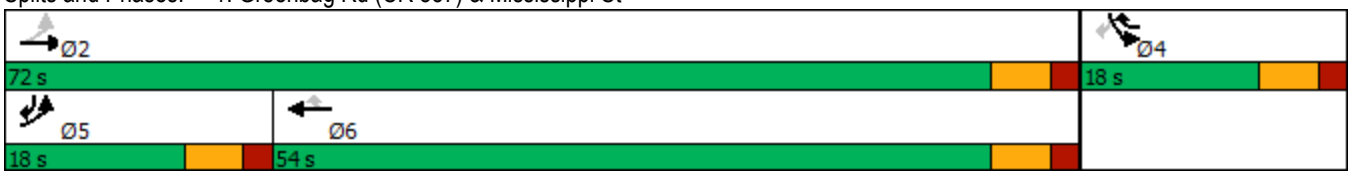
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1753	1846	1783	1546	1727	1530
Flt Permitted	0.220				0.950	
Satd. Flow (perm)	406	1846	1783	1546	1727	1530
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				191		99
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	720	539	191	59	99
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

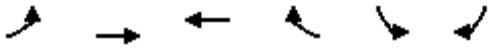


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	16.0	16.0	16.0
Total Split (s)	18.0	72.0	54.0	18.0	18.0	18.0
Total Split (%)	20.0%	80.0%	60.0%	20.0%	20.0%	20.0%
Maximum Green (s)	12.0	66.0	48.0	12.0	12.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	39.4	39.4	23.0	36.9	7.6	24.1
Actuated g/C Ratio	0.66	0.66	0.39	0.62	0.13	0.41
v/c Ratio	0.41	0.59	0.78	0.19	0.27	0.15
Control Delay	6.3	7.8	25.0	1.2	30.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.8	25.0	1.2	30.1	4.4
LOS	A	A	C	A	C	A
Approach Delay		7.4	18.8		14.0	
Approach LOS		A	B		B	
Queue Length 50th (ft)	21	110	160	0	19	0
Queue Length 95th (ft)	47	213	291	16	60	29
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	550	1791	1463	1140	361	732
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.40	0.37	0.17	0.16	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 59.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

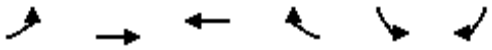




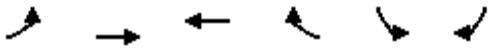
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	189	670	501	178	55	92
Future Volume (veh/h)	189	670	501	178	55	92
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1909	1909	1844	1881	1881	1862
Adj Flow Rate, veh/h	203	720	539	191	59	99
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	2	0	0	1
Cap, veh/h	447	1192	719	800	198	336
Arrive On Green	0.10	0.62	0.39	0.39	0.11	0.11
Sat Flow, veh/h	1818	1909	1844	1599	1791	1583
Grp Volume(v), veh/h	203	720	539	191	59	99
Grp Sat Flow(s),veh/h/ln	1818	1909	1844	1599	1791	1583
Q Serve(g_s), s	2.6	10.3	11.4	3.1	1.4	2.4
Cycle Q Clear(g_c), s	2.6	10.3	11.4	3.1	1.4	2.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	447	1192	719	800	198	336
V/C Ratio(X)	0.45	0.60	0.75	0.24	0.30	0.29
Avail Cap(c_a), veh/h	743	2784	1956	1872	475	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	5.1	11.9	6.4	18.5	15.0
Incr Delay (d2), s/veh	0.7	0.5	1.6	0.2	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.4	6.0	1.7	0.7	2.3
LnGrp Delay(d),s/veh	8.9	5.6	13.5	6.6	19.3	15.5
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h		923	730		158	
Approach Delay, s/veh		6.4	11.7		16.9	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		34.3		11.0	10.6	23.7		
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		
Max Green Setting (Gmax), s		66.0		12.0	12.0	48.0		
Max Q Clear Time (g_c+I1), s		12.3		4.4	4.6	13.4		
Green Ext Time (p_c), s		5.6		0.3	0.3	4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	9.4
HCM 2010 LOS	A



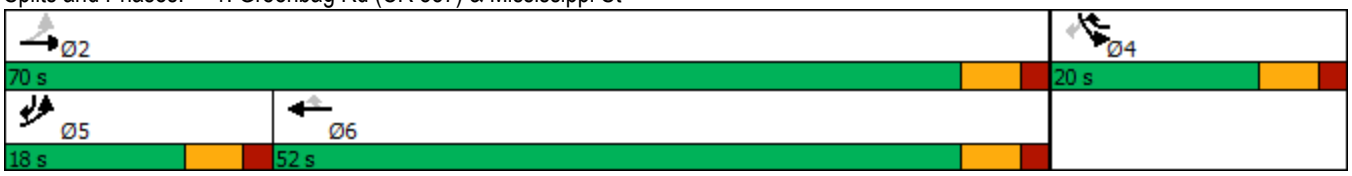
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	465	345	40	28	36
Future Volume (vph)	46	465	345	40	28	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1719	1846	1783	1546	1727	1546
Flt Permitted	0.353				0.950	
Satd. Flow (perm)	639	1846	1783	1546	1727	1546
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				43		38
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%
Adj. Flow (vph)	49	495	367	43	30	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	495	367	43	30	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

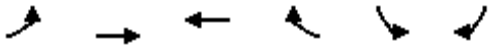


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	16.0	16.0	16.0
Total Split (s)	18.0	70.0	52.0	20.0	20.0	18.0
Total Split (%)	20.0%	77.8%	57.8%	22.2%	22.2%	20.0%
Maximum Green (s)	12.0	64.0	46.0	14.0	14.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	21.3	21.3	14.7	31.3	6.7	20.0
Actuated g/C Ratio	0.52	0.52	0.36	0.77	0.16	0.49
v/c Ratio	0.10	0.52	0.57	0.04	0.11	0.05
Control Delay	4.3	7.8	16.2	1.6	20.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	7.8	16.2	1.6	20.0	4.3
LOS	A	A	B	A	C	A
Approach Delay		7.4	14.7		11.2	
Approach LOS		A	B		B	
Queue Length 50th (ft)	4	57	79	0	7	0
Queue Length 95th (ft)	13	112	158	8	28	14
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	685	1846	1711	1324	637	1000
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.27	0.21	0.03	0.05	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 40.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 41.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

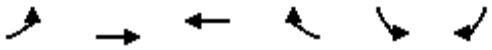




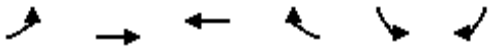
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	465	345	40	28	36
Future Volume (veh/h)	46	465	345	40	28	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	1909	1844	1881	1881	1881
Adj Flow Rate, veh/h	49	495	367	43	30	38
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	1	2	0	0	0
Cap, veh/h	419	994	548	701	253	312
Arrive On Green	0.05	0.52	0.30	0.30	0.14	0.14
Sat Flow, veh/h	1783	1909	1844	1599	1791	1599
Grp Volume(v), veh/h	49	495	367	43	30	38
Grp Sat Flow(s),veh/h/ln	1783	1909	1844	1599	1791	1599
Q Serve(g_s), s	0.6	5.9	6.2	0.6	0.5	0.7
Cycle Q Clear(g_c), s	0.6	5.9	6.2	0.6	0.5	0.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	419	994	548	701	253	312
V/C Ratio(X)	0.12	0.50	0.67	0.06	0.12	0.12
Avail Cap(c_a), veh/h	926	3447	2393	2300	707	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	5.5	10.9	5.7	13.3	11.8
Incr Delay (d2), s/veh	0.1	0.4	1.4	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.1	3.3	0.3	0.3	0.7
LnGrp Delay(d),s/veh	7.5	5.9	12.4	5.8	13.5	11.9
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h		544	410		68	
Approach Delay, s/veh		6.0	11.7		12.6	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		24.5		11.0	7.9	16.5		
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0		
Max Green Setting (Gmax), s		64.0		14.0	12.0	46.0		
Max Q Clear Time (g_c+I1), s		7.9		2.7	2.6	8.2		
Green Ext Time (p_c), s		3.3		0.1	0.0	2.3		

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A



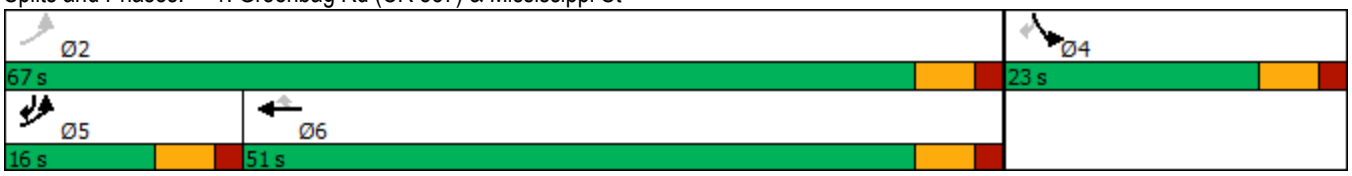
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	147	0	555	220	144	140	
Future Volume (vph)	147	0	555	220	144	140	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	11	11	11	11	
Grade (%)		-3%	2%		2%		
Storage Length (ft)	100			0	225	0	
Storage Lanes	0			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1687	0	1748	1405	1464	1392	
Flt Permitted	0.176				0.950		
Satd. Flow (perm)	312	0	1748	1405	1464	1392	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				256		163	
Link Speed (mph)		40	40		25		
Link Distance (ft)		456	285		743		
Travel Time (s)		7.8	4.9		20.3		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%	
Adj. Flow (vph)	171	0	645	256	167	163	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	171	0	645	256	167	163	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		11	0		11		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1		2	1	1	1	
Detector Template	Left		Thru	Right	Left	Right	
Leading Detector (ft)	20		100	20	20	20	
Trailing Detector (ft)	0		0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	
Detector 1 Size(ft)	20		6	20	20	20	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94				
Detector 2 Size(ft)			6				
Detector 2 Type			Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)			0.0				

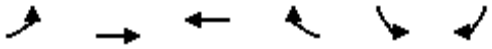


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Turn Type	pm+pt		NA	Perm	Prot	pm+ov	
Protected Phases	5		6		4	5	2
Permitted Phases	2			6		4	
Detector Phase	5		6	6	4	5	
Switch Phase							
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0		24.0	24.0	16.0	16.0	24.0
Total Split (s)	16.0		51.0	51.0	23.0	16.0	67.0
Total Split (%)	17.8%		56.7%	56.7%	25.6%	17.8%	74%
Maximum Green (s)	10.0		45.0	45.0	17.0	10.0	61.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	None		None	None	Min	None	None
Act Effct Green (s)	48.8		32.8	32.8	13.0	29.0	
Actuated g/C Ratio	0.66		0.44	0.44	0.17	0.39	
v/c Ratio	0.45		0.84	0.34	0.65	0.25	
Control Delay	8.8		29.2	3.1	43.9	4.6	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	8.8		29.2	3.1	43.9	4.6	
LOS	A		C	A	D	A	
Approach Delay		8.8	21.8		24.5		
Approach LOS		A	C		C		
Queue Length 50th (ft)	26		255	0	74	0	
Queue Length 95th (ft)	50		384	31	146	35	
Internal Link Dist (ft)		376	205		663		
Turn Bay Length (ft)	100				225		
Base Capacity (vph)	397		1104	982	349	654	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.43		0.58	0.26	0.48	0.25	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 74.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 20.8		Intersection LOS: C	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

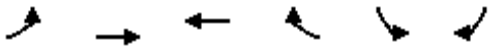




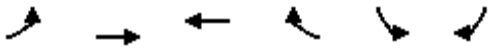
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	0	555	220	144	140
Future Volume (veh/h)	147	0	555	220	144	140
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1837	0	1809	1710	1594	1695
Adj Flow Rate, veh/h	171	0	645	256	167	163
Adj No. of Lanes	1	0	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	0	4	10	18	11
Cap, veh/h	332	0	783	629	227	392
Arrive On Green	0.12	0.00	0.43	0.43	0.15	0.15
Sat Flow, veh/h	1749	171	1809	1454	1518	1440
Grp Volume(v), veh/h	171	27.2	645	256	167	163
Grp Sat Flow(s),veh/h/ln	1749	C	1809	1454	1518	1440
Q Serve(g_s), s	5.8		19.2	7.4	6.4	5.7
Cycle Q Clear(g_c), s	5.8		19.2	7.4	6.4	5.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	332		783	629	227	392
V/C Ratio(X)	0.52		0.82	0.41	0.73	0.42
Avail Cap(c_a), veh/h	405		1335	1073	423	577
HCM Platoon Ratio	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9		15.2	11.9	24.8	18.2
Incr Delay (d2), s/veh	1.2		2.3	0.4	4.6	0.7
Initial Q Delay(d3),s/veh	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9		10.0	3.0	3.0	4.8
LnGrp Delay(d),s/veh	27.2		17.5	12.3	29.3	18.9
LnGrp LOS	C		B	B	C	B
Approach Vol, veh/h			901		330	
Approach Delay, s/veh			16.0		24.2	
Approach LOS			B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4	5	6		
Phs Duration (G+Y+Rc), s				15.1	13.4	32.4		
Change Period (Y+Rc), s				6.0	6.0	6.0		
Max Green Setting (Gmax), s				17.0	10.0	45.0		
Max Q Clear Time (g_c+I1), s				8.4	7.8	21.2		
Green Ext Time (p_c), s				0.7	0.1	5.2		

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B



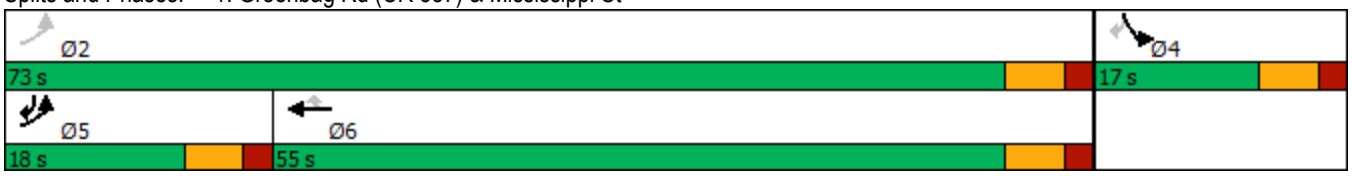
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	189	0	501	178	55	92	
Future Volume (vph)	189	0	501	178	55	92	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	11	11	11	11	
Grade (%)		-3%	2%		2%		
Storage Length (ft)	100			0	225	0	
Storage Lanes	0			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1753	0	1783	1546	1727	1530	
Flt Permitted	0.222				0.950		
Satd. Flow (perm)	410	0	1783	1546	1727	1530	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				191		99	
Link Speed (mph)		40	40		25		
Link Distance (ft)		456	285		743		
Travel Time (s)		7.8	4.9		20.3		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%	
Adj. Flow (vph)	203	0	539	191	59	99	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	203	0	539	191	59	99	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		11	0		11		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1		2	1	1	1	
Detector Template	Left		Thru	Right	Left	Right	
Leading Detector (ft)	20		100	20	20	20	
Trailing Detector (ft)	0		0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	
Detector 1 Size(ft)	20		6	20	20	20	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94				
Detector 2 Size(ft)			6				
Detector 2 Type			Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)			0.0				

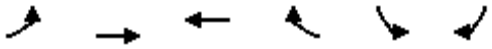


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Turn Type	pm+pt		NA	Perm	Prot	pm+ov	
Protected Phases	5		6		4	5	2
Permitted Phases	2			6		4	
Detector Phase	5		6	6	4	5	
Switch Phase							
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0		24.0	24.0	16.0	16.0	24.0
Total Split (s)	18.0		55.0	55.0	17.0	18.0	73.0
Total Split (%)	20.0%		61.1%	61.1%	18.9%	20.0%	81%
Maximum Green (s)	12.0		49.0	49.0	11.0	12.0	67.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	None		None	None	Min	None	None
Act Effct Green (s)	40.9		23.8	23.8	7.7	24.8	
Actuated g/C Ratio	0.67		0.39	0.39	0.13	0.41	
v/c Ratio	0.40		0.78	0.27	0.27	0.15	
Control Delay	6.0		24.7	3.1	31.0	4.5	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	6.0		24.7	3.1	31.0	4.5	
LOS	A		C	A	C	A	
Approach Delay		6.0	19.1		14.4		
Approach LOS		A	B		B		
Queue Length 50th (ft)	21		169	0	20	0	
Queue Length 95th (ft)	47		289	31	61	29	
Internal Link Dist (ft)		376	205		663		
Turn Bay Length (ft)	100				225		
Base Capacity (vph)	548		1451	1294	323	717	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.37		0.37	0.15	0.18	0.14	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 61			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

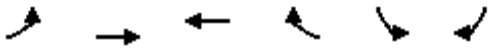




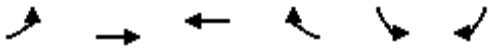
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	189	0	501	178	55	92
Future Volume (veh/h)	189	0	501	178	55	92
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1909	0	1844	1881	1881	1862
Adj Flow Rate, veh/h	203	0	539	191	59	99
Adj No. of Lanes	1	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	0	2	0	0	1
Cap, veh/h	409	0	707	613	184	390
Arrive On Green	0.14	0.00	0.38	0.38	0.10	0.10
Sat Flow, veh/h	1818	203	1844	1599	1791	1583
Grp Volume(v), veh/h	203	20.9	539	191	59	99
Grp Sat Flow(s),veh/h/ln	1818	C	1844	1599	1791	1583
Q Serve(g_s), s	5.2		12.4	4.1	1.5	2.4
Cycle Q Clear(g_c), s	5.2		12.4	4.1	1.5	2.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	409		707	613	184	390
V/C Ratio(X)	0.50		0.76	0.31	0.32	0.25
Avail Cap(c_a), veh/h	597		1860	1613	406	585
HCM Platoon Ratio	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0		13.1	10.5	20.2	14.7
Incr Delay (d2), s/veh	0.9		1.7	0.3	1.0	0.3
Initial Q Delay(d3),s/veh	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6		6.5	1.8	0.8	2.4
LnGrp Delay(d),s/veh	20.9		14.8	10.8	21.2	15.1
LnGrp LOS	C		B	B	C	B
Approach Vol, veh/h			730		158	
Approach Delay, s/veh			13.7		17.4	
Approach LOS			B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4	5	6		
Phs Duration (G+Y+Rc), s				11.0	13.0	24.6		
Change Period (Y+Rc), s				6.0	6.0	6.0		
Max Green Setting (Gmax), s				11.0	12.0	49.0		
Max Q Clear Time (g_c+I1), s				4.4	7.2	14.4		
Green Ext Time (p_c), s				0.2	0.2	4.2		

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B



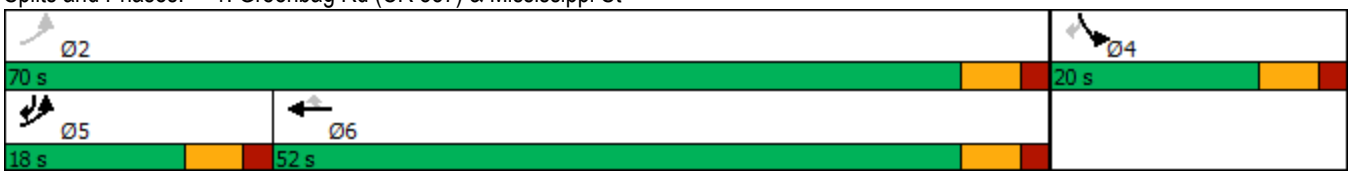
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	46	0	345	40	28	36	
Future Volume (vph)	46	0	345	40	28	36	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	11	11	11	11	
Grade (%)		-3%	2%		2%		
Storage Length (ft)	100			0	225	0	
Storage Lanes	0			1	1	1	
Taper Length (ft)	75				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1719	0	1783	1546	1727	1546	
Flt Permitted	0.349				0.950		
Satd. Flow (perm)	632	0	1783	1546	1727	1546	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				43		38	
Link Speed (mph)		40	40		25		
Link Distance (ft)		456	285		743		
Travel Time (s)		7.8	4.9		20.3		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Heavy Vehicles (%)	3%	1%	2%	0%	0%	0%	
Adj. Flow (vph)	49	0	367	43	30	38	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	49	0	367	43	30	38	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		11	0		11		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1		2	1	1	1	
Detector Template	Left		Thru	Right	Left	Right	
Leading Detector (ft)	20		100	20	20	20	
Trailing Detector (ft)	0		0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	
Detector 1 Size(ft)	20		6	20	20	20	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)			94				
Detector 2 Size(ft)			6				
Detector 2 Type			Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)			0.0				

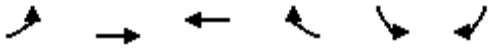


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø2
Turn Type	pm+pt		NA	Perm	Prot	pm+ov	
Protected Phases	5		6		4	5	2
Permitted Phases	2			6		4	
Detector Phase	5		6	6	4	5	
Switch Phase							
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0		24.0	24.0	16.0	16.0	24.0
Total Split (s)	18.0		52.0	52.0	20.0	18.0	70.0
Total Split (%)	20.0%		57.8%	57.8%	22.2%	20.0%	78%
Maximum Green (s)	12.0		46.0	46.0	14.0	12.0	64.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	None		None	None	Min	None	None
Act Effct Green (s)	21.3		14.5	14.5	6.8	20.6	
Actuated g/C Ratio	0.52		0.35	0.35	0.17	0.50	
v/c Ratio	0.09		0.59	0.08	0.11	0.05	
Control Delay	4.2		16.8	4.8	20.7	4.3	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.2		16.8	4.8	20.7	4.3	
LOS	A		B	A	C	A	
Approach Delay		4.2	15.5		11.5		
Approach LOS		A	B		B		
Queue Length 50th (ft)	4		80	0	7	0	
Queue Length 95th (ft)	13		163	15	29	14	
Internal Link Dist (ft)		376	205		663		
Turn Bay Length (ft)	100				225		
Base Capacity (vph)	692		1695	1472	642	1007	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.07		0.22	0.03	0.05	0.04	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 41.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	0	345	40	28	36
Future Volume (veh/h)	46	0	345	40	28	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1872	0	1844	1881	1881	1881
Adj Flow Rate, veh/h	49	0	367	43	30	38
Adj No. of Lanes	1	0	1	1	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	0	2	0	0	0
Cap, veh/h	301	0	541	469	254	313
Arrive On Green	0.05	0.00	0.29	0.29	0.14	0.14
Sat Flow, veh/h	1783	49	1844	1599	1791	1599
Grp Volume(v), veh/h	49	16.4	367	43	30	38
Grp Sat Flow(s),veh/h/ln	1783	B	1844	1599	1791	1599
Q Serve(g_s), s	0.9		6.2	0.7	0.5	0.7
Cycle Q Clear(g_c), s	0.9		6.2	0.7	0.5	0.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	301		541	469	254	313
V/C Ratio(X)	0.16		0.68	0.09	0.12	0.12
Avail Cap(c_a), veh/h	811		2406	2086	711	721
HCM Platoon Ratio	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1		11.0	9.0	13.2	11.7
Incr Delay (d2), s/veh	0.3		1.5	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5		3.3	0.3	0.3	0.7
LnGrp Delay(d),s/veh	16.4		12.5	9.1	13.4	11.8
LnGrp LOS	B		B	A	B	B
Approach Vol, veh/h			410		68	
Approach Delay, s/veh			12.1		12.5	
Approach LOS			B		B	

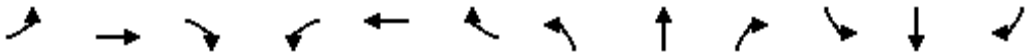
Timer	1	2	3	4	5	6	7	8
Assigned Phs				4	5	6		
Phs Duration (G+Y+Rc), s				11.0	7.9	16.3		
Change Period (Y+Rc), s				6.0	6.0	6.0		
Max Green Setting (Gmax), s				14.0	12.0	46.0		
Max Q Clear Time (g_c+I1), s				2.7	2.9	8.2		
Green Ext Time (p_c), s				0.1	0.0	2.3		

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

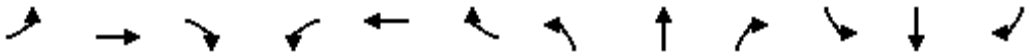
Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & DORSEY AVENUE/KINGWOOD PIKE

With Luckey Lane Connection to Greenbag Road To Remain



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.958			0.921	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1567	1628	0	1678	1728	0	0	1711	0	0	1457	0
Flt Permitted	0.134			0.318				0.763			0.678	
Satd. Flow (perm)	221	1628	0	562	1728	0	0	1328	0	0	1004	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			30			93	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	538	0	0	618	0	0	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



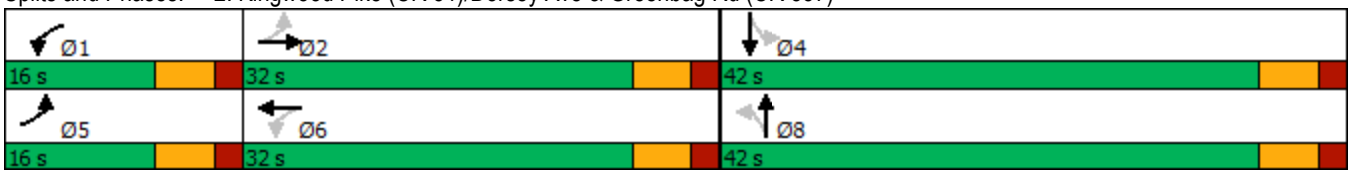
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	16.0	32.0		16.0	32.0		42.0	42.0		42.0	42.0	
Total Split (%)	17.8%	35.6%		17.8%	35.6%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	10.0	26.0		10.0	26.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	35.0	29.8		31.4	26.1			36.2			36.2	
Actuated g/C Ratio	0.41	0.35		0.37	0.30			0.42			0.42	
v/c Ratio	0.35	0.77		0.12	1.02			1.07			0.60	
Control Delay	18.5	37.1		14.6	76.5			83.8			20.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	18.5	37.1		14.6	76.5			83.8			20.1	
LOS	B	D		B	E			F			C	
Approach Delay		34.3			72.8			83.8			20.1	
Approach LOS		C			E			F			C	
Queue Length 50th (ft)	23	224		10	~328			~384			82	
Queue Length 95th (ft)	48	#399		26	#543			#610			180	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	249	570		353	528			578			478	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.30	0.77		0.10	1.02			1.07			0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 85.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 58.7		Intersection LOS: E	
Intersection Capacity Utilization 88.2%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

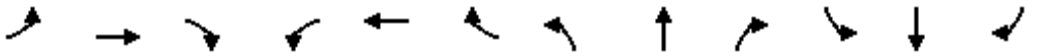
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



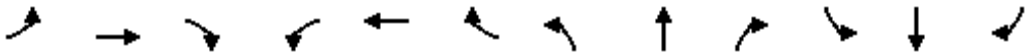
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1706	1706	1843	1828	1798	1919	1966	1947	1966	1834	1723	1834
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	174	500	47	224	530	22	260	235	197	187	73	285
Arrive On Green	0.05	0.33	0.33	0.03	0.31	0.31	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	1625	1534	146	1741	1716	70	474	550	461	306	170	666
Grp Volume(v), veh/h	75	0	438	34	0	538	618	0	0	288	0	0
Grp Sat Flow(s),veh/h/ln	1625	0	1680	1741	0	1786	1485	0	0	1141	0	0
Q Serve(g_s), s	2.6	0.0	20.0	1.1	0.0	25.1	19.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.6	0.0	20.0	1.1	0.0	25.1	34.4	0.0	0.0	14.9	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.04	0.34		0.31	0.32		0.58
Lane Grp Cap(c), veh/h	174	0	547	224	0	552	693	0	0	545	0	0
V/C Ratio(X)	0.43	0.00	0.80	0.15	0.00	0.97	0.89	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	288	0	547	374	0	552	693	0	0	545	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.1	0.0	25.9	20.7	0.0	28.7	24.0	0.0	0.0	17.6	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	8.3	0.3	0.0	31.9	13.9	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	10.5	0.5	0.0	17.1	16.8	0.0	0.0	5.1	0.0	0.0
LnGrp Delay(d),s/veh	23.8	0.0	34.2	21.0	0.0	60.6	37.9	0.0	0.0	18.6	0.0	0.0
LnGrp LOS	C		C	C		E	D			B		
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		32.7			58.2			37.9			18.6	
Approach LOS		C			E			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	33.4		42.0	10.1	32.0		42.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	26.0		36.0	10.0	26.0		36.0
Max Q Clear Time (g_c+I1), s	3.1	22.0		16.9	4.6	27.1		36.4
Green Ext Time (p_c), s	0.0	0.9		1.8	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	39.6
HCM 2010 LOS	D



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.990			0.958			0.960	
Flt Protected	0.950			0.950				0.984			0.987	
Satd. Flow (prot)	1692	1709	0	1762	1820	0	0	1680	0	0	1608	0
Flt Permitted	0.228			0.127				0.647			0.811	
Satd. Flow (perm)	406	1709	0	236	1820	0	0	1104	0	0	1321	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			4			27			25	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	505	0	0	242	0	0	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	16.0	38.0		16.0	38.0		36.0	36.0		36.0	36.0	
Total Split (%)	17.8%	42.2%		17.8%	42.2%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	10.0	32.0		10.0	32.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	41.2	32.0		40.0	31.5			30.0			30.0	
Actuated g/C Ratio	0.47	0.36		0.45	0.36			0.34			0.34	
v/c Ratio	0.51	1.19		0.52	0.78			0.62			1.18	
Control Delay	17.3	129.6		20.1	35.4			30.1			131.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	17.3	129.6		20.1	35.4			30.1			131.4	
LOS	B	F		C	D			C			F	
Approach Delay		109.5			32.3			30.1			131.4	
Approach LOS		F			C			C			F	
Queue Length 50th (ft)	46	~510		35	250			99			~366	
Queue Length 95th (ft)	78	#732		70	#378			184			#567	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	337	629		282	659			391			464	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.49	1.19		0.46	0.77			0.62			1.18	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 88.6			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 85.4		Intersection LOS: F	
Intersection Capacity Utilization 91.8%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

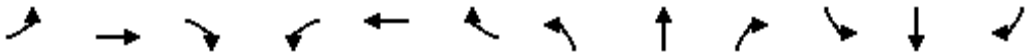
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



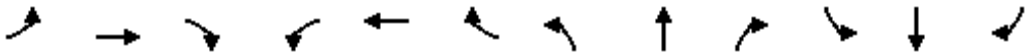
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1829	1843	1919	1901	1919	1966	1909	1966	1834	1818	1834
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	3	3	3	0	0	0
Cap, veh/h	334	512	146	205	629	45	163	180	129	183	242	155
Arrive On Green	0.08	0.37	0.37	0.07	0.36	0.36	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1755	1370	390	1828	1752	127	307	513	368	370	690	444
Grp Volume(v), veh/h	164	0	750	131	0	505	242	0	0	549	0	0
Grp Sat Flow(s),veh/h/ln	1755	0	1760	1828	0	1879	1188	0	0	1504	0	0
Q Serve(g_s), s	4.9	0.0	32.0	3.8	0.0	20.2	0.0	0.0	0.0	17.6	0.0	0.0
Cycle Q Clear(g_c), s	4.9	0.0	32.0	3.8	0.0	20.2	12.4	0.0	0.0	30.0	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.07	0.33		0.31	0.27		0.30
Lane Grp Cap(c), veh/h	334	0	658	205	0	674	472	0	0	580	0	0
V/C Ratio(X)	0.49	0.00	1.14	0.64	0.00	0.75	0.51	0.00	0.00	0.95	0.00	0.00
Avail Cap(c_a), veh/h	397	0	658	297	0	702	472	0	0	580	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.8	0.0	26.8	20.8	0.0	24.1	21.5	0.0	0.0	28.4	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	80.7	3.3	0.0	4.3	0.9	0.0	0.0	24.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	30.1	2.1	0.0	11.2	4.6	0.0	0.0	16.8	0.0	0.0
LnGrp Delay(d),s/veh	18.9	0.0	107.5	24.1	0.0	28.4	22.5	0.0	0.0	53.2	0.0	0.0
LnGrp LOS	B		F	C		C	C			D		
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		91.6			27.5			22.5			53.2	
Approach LOS		F			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.6	38.0		36.0	12.9	36.7		36.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	32.0		30.0	10.0	32.0		30.0
Max Q Clear Time (g_c+I1), s	5.8	34.0		32.0	6.9	22.2		14.4
Green Ext Time (p_c), s	0.1	0.0		0.0	0.1	2.1		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	58.0
HCM 2010 LOS	E



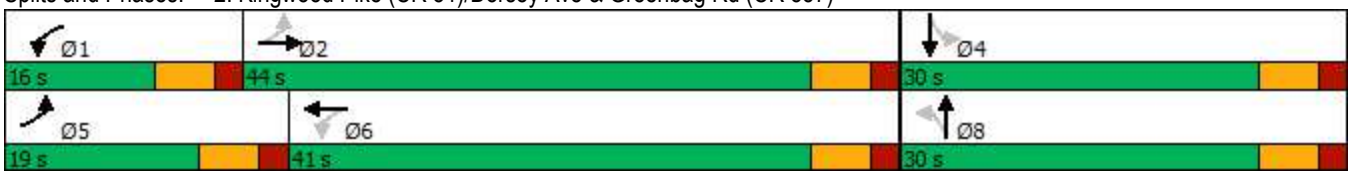
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.987			0.964			0.941	
Flt Protected	0.950			0.950				0.982			0.988	
Satd. Flow (prot)	1643	1709	0	1762	1814	0	0	1737	0	0	1571	0
Flt Permitted	0.504			0.479				0.816			0.890	
Satd. Flow (perm)	872	1709	0	889	1814	0	0	1444	0	0	1415	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			6			20			42	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	92	329	80	63	260	24	59	58	43	48	64	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	409	0	63	284	0	0	160	0	0	198	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	19.0	44.0		16.0	41.0		30.0	30.0		30.0	30.0	
Total Split (%)	21.1%	48.9%		17.8%	45.6%		33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	13.0	38.0		10.0	35.0		24.0	24.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	26.2	22.0		23.3	18.3			12.2			12.2	
Actuated g/C Ratio	0.48	0.41		0.43	0.34			0.23			0.23	
v/c Ratio	0.17	0.58		0.13	0.46			0.47			0.56	
Control Delay	7.4	18.3		7.4	18.4			23.5			23.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	7.4	18.3		7.4	18.4			23.5			23.7	
LOS	A	B		A	B			C			C	
Approach Delay		16.3			16.4			23.5			23.7	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	12	107		8	71			39			44	
Queue Length 95th (ft)	37	234		27	160			109			126	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	664	1251		601	1249			714			711	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.14	0.33		0.10	0.23			0.22			0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 54.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1789	1821	1843	1919	1902	1919	1966	1966	1966	1834	1810	1834
Adj Flow Rate, veh/h	92	329	80	63	260	24	59	58	43	48	64	86
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	1	1	0	1	1	0	0	0	0	0	0
Cap, veh/h	494	448	109	400	514	47	209	148	87	159	115	126
Arrive On Green	0.08	0.32	0.32	0.06	0.30	0.30	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1704	1416	344	1828	1715	158	491	816	480	273	635	697
Grp Volume(v), veh/h	92	0	409	63	0	284	160	0	0	198	0	0
Grp Sat Flow(s),veh/h/ln	1704	0	1760	1828	0	1874	1787	0	0	1605	0	0
Q Serve(g_s), s	1.4	0.0	8.5	0.9	0.0	5.1	0.0	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	8.5	0.9	0.0	5.1	3.1	0.0	0.0	4.6	0.0	0.0
Prop In Lane	1.00		0.20	1.00		0.08	0.37		0.27	0.24		0.43
Lane Grp Cap(c), veh/h	494	0	557	400	0	562	444	0	0	400	0	0
V/C Ratio(X)	0.19	0.00	0.73	0.16	0.00	0.51	0.36	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), veh/h	900	0	1635	733	0	1603	1089	0	0	1020	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.7	0.0	12.4	9.4	0.0	11.8	15.0	0.0	0.0	15.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.9	0.2	0.0	0.7	0.5	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	4.4	0.5	0.0	2.7	1.7	0.0	0.0	2.2	0.0	0.0
LnGrp Delay(d),s/veh	8.9	0.0	14.3	9.6	0.0	12.5	15.5	0.0	0.0	16.5	0.0	0.0
LnGrp LOS	A		B	A		B	B			B		
Approach Vol, veh/h		501			347			160			198	
Approach Delay, s/veh		13.3			12.0			15.5			16.5	
Approach LOS		B			B			B			B	

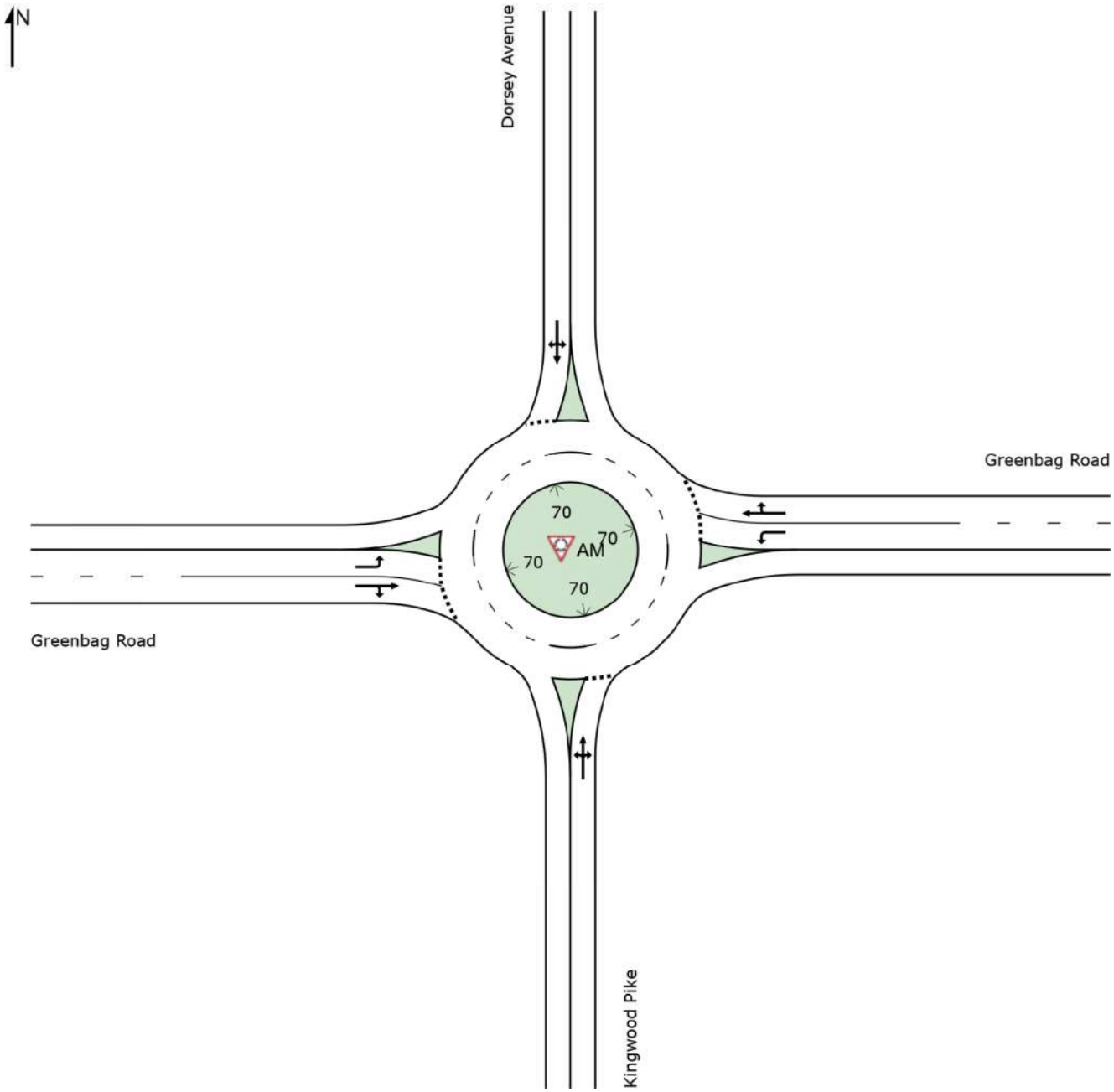
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	18.9		13.4	9.2	18.3		13.4
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	38.0		24.0	13.0	35.0		24.0
Max Q Clear Time (g_c+I1), s	2.9	10.5		6.6	3.4	7.1		5.1
Green Ext Time (p_c), s	0.1	2.5		1.0	0.1	1.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

SITE LAYOUT

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout



MOVEMENT SUMMARY

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	208	1.0	0.960	35.7	LOS D	17.9	451.7	1.00	1.51	2.42	25.7
8	T1	218	1.0	0.960	30.9	LOS C	17.9	451.7	1.00	1.51	2.42	25.8
18	R2	192	1.0	0.960	30.4	LOS C	17.9	451.7	1.00	1.51	2.42	25.2
Approach		618	1.0	0.960	32.3	LOS C	17.9	451.7	1.00	1.51	2.42	25.6
East: Greenbag Road												
1	L2	34	5.0	0.084	14.6	LOS B	0.3	9.0	0.60	0.82	0.60	32.2
6	T1	517	7.0	0.742	12.9	LOS B	8.0	210.2	0.91	1.06	1.22	33.1
16	R2	21	0.0	0.742	12.2	LOS B	8.0	210.2	0.91	1.06	1.22	32.2
Approach		572	6.6	0.742	13.0	LOS B	8.0	210.2	0.89	1.05	1.19	33.0
North: Dorsey Avenue												
7	L2	92	0.0	0.587	18.1	LOS B	4.0	104.2	0.82	1.01	1.08	31.9
4	T1	28	0.0	0.587	13.2	LOS B	4.0	104.2	0.82	1.01	1.08	31.9
14	R2	168	11.0	0.587	13.9	LOS B	4.0	104.2	0.82	1.01	1.08	31.0
Approach		289	6.4	0.587	15.2	LOS B	4.0	104.2	0.82	1.01	1.08	31.4
West: Greenbag Road												
5	L2	75	8.0	0.129	11.3	LOS B	0.5	13.9	0.37	0.68	0.37	33.8
2	T1	400	7.0	0.440	5.8	LOS A	2.7	71.7	0.43	0.53	0.43	35.8
12	R2	38	15.0	0.440	5.8	LOS A	2.7	71.7	0.43	0.53	0.43	34.4
Approach		513	7.7	0.440	6.6	LOS A	2.7	71.7	0.42	0.55	0.42	35.4
All Vehicles		1992	5.1	0.960	17.6	LOS B	17.9	451.7	0.79	1.06	1.36	30.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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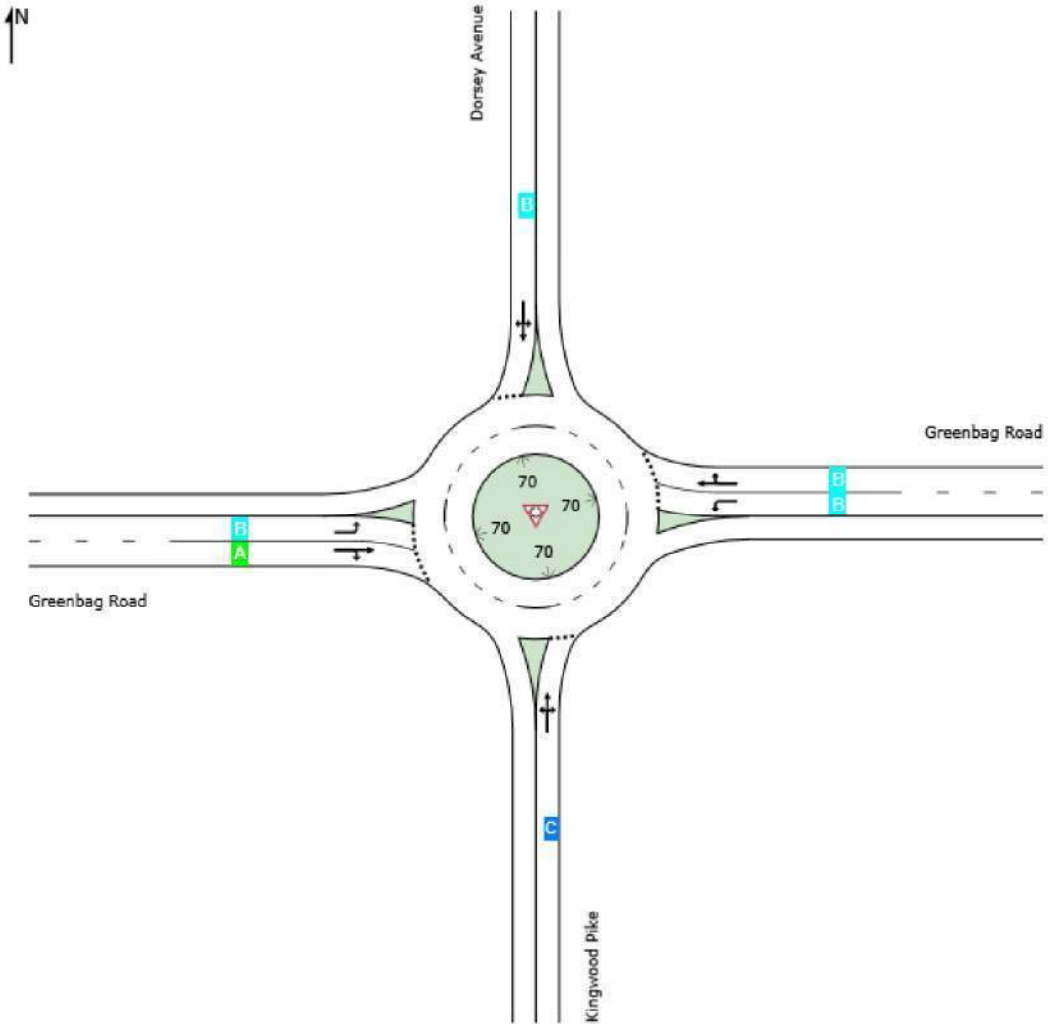
LANE LEVEL OF SERVICE

Lane Level of Service

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	C	B	B	A	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

QUEUE DISTANCE (%ILE)

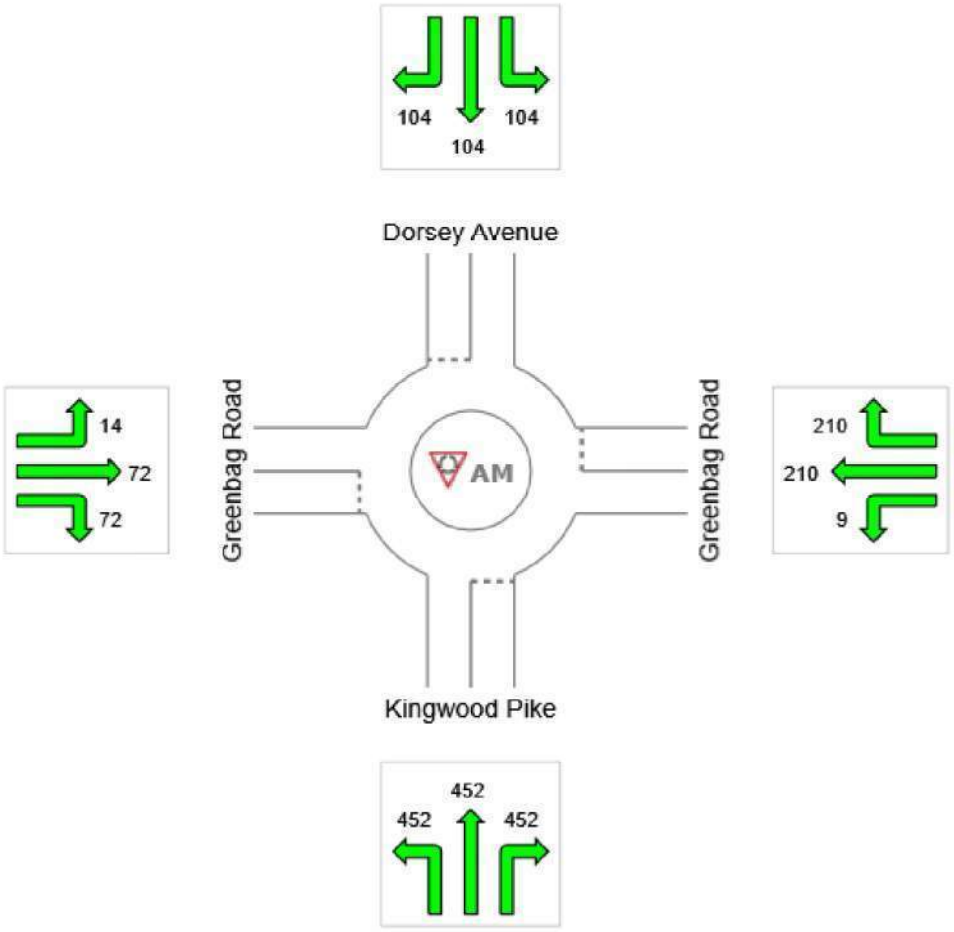
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	452	210	104	72	452



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

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DETAILED OUTPUT

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

- Roundabouts
  - Roundabout Basic Parameters
  - Roundabout Circulating / Exiting Stream Parameters
  - Roundabout Gap Acceptance Parameters
  - Roundabout Flow Rates
- Movements
  - Intersection Negotiation and Travel Data
  - Movement Capacity and Performance Parameters
  - Fuel Consumption, Emissions and Cost
- Lanes
  - Lane Performance and Capacity Information
  - Lane, Approach and Intersection Performance
  - Driver Characteristics
  - Lane Delays
  - Lane Queues
  - Lane Queue Percentiles
  - Lane Stops
- Flow Rates
  - Origin-Destination Flow Rates (Total)
  - Origin-Destination Flow Rates by Movement Class
  - Lane Flow Rates
- Other
  - Parameter Settings Summary
  - Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	567	1.06	601	0.0	0.0	N	0.949	19.9	1.52	0.429
N	T1	1	Dominant	567	1.06	601	0.0	0.0	N	0.949	19.9	1.52	0.429
E	R2	1	Dominant	567	1.06	601	0.0	0.0	N	0.949	19.9	1.52	0.429
East: Greenbag Road													
S	L2	1	Subdominant	501	1.02	511	0.0	0.0	N	0.882	17.9	2.00	0.466
W	T1	2	Dominant	501	1.02	511	0.0	0.0	N	0.882	17.9	2.00	0.466
N	R2	2	Dominant	501	1.02	511	0.0	0.0	N	0.882	17.9	2.00	0.466

North: Dorsey Avenue												
E	L2	1	Dominant	759	1.05	799	0.0	0.0	N	0.858	19.7	1.71	0.573
S	T1	1	Dominant	759	1.05	799	0.0	0.0	N	0.858	19.7	1.71	0.573
W	R2	1	Dominant	759	1.05	799	0.0	0.0	N	0.858	19.7	1.71	0.573
West: Greenbag Road													
N	L2	1	Subdominant	154	1.01	156	0.0	0.0	N	0.973	16.1	2.00	0.173
E	T1	2	Dominant	154	1.01	156	0.0	0.0	N	0.973	16.1	2.00	0.173
S	R2	2	Dominant	154	1.01	156	0.0	0.0	N	0.973	16.1	2.00	0.173

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.52	0.429	N	1.01	4.74	138.0	3.16
N	T1	1	Dominant	1.52	0.429	N	1.01	4.74	138.0	3.16
E	R2	1	Dominant	1.52	0.429	N	1.01	4.74	138.0	3.16
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.466	Y	1.05	6.32	166.2	4.44
W	T1	2	Dominant	2.00	0.466	Y	1.07	4.13	108.6	2.91
N	R2	2	Dominant	2.00	0.466	Y	1.00	3.86	101.5	2.72
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.71	0.573	Y	1.00	4.12	119.0	3.05
S	T1	1	Dominant	1.71	0.573	Y	1.00	4.12	119.0	3.05
W	R2	1	Dominant	1.71	0.573	Y	1.11	4.57	132.1	3.39
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.173	N	1.08	7.46	176.4	4.87
E	T1	2	Dominant	2.00	0.173	Y	1.07	4.67	110.5	3.05
S	R2	2	Dominant	2.00	0.173	Y	1.15	5.02	118.7	3.28

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway
is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two
successive vehicles across all lanes in the circulating
or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	75	81	13.5%
2	492	520	86.5%
Total	567	601	
East: Greenbag Road			
1	0	0	0.0%
2	501	511	100.0%
Total	501	511	
North: Dorsey Avenue			
1	34	35	4.4%
2	725	763	95.6%
Total	759	798	
West: Greenbag Road			
1	0	0	0.0%
2	154	156	100.0%
Total	154	156	

The SIDRA Standard roundabout capacity model option is in use.
This model takes into account the total circulating flow as well as the effect

of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	192	426	618
Total	192	426	618
East: Greenbag Road			
1	0	34	34
2	21	517	538
Total	21	551	572
North: Dorsey Avenue			
1	168	121	289
Total	168	121	289
West: Greenbag Road			
1	0	75	75
2	38	400	438
Total	38	475	513

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	29.9	25.7	3334.2#	88.3#	131.1	131.1	5.1
	North	T1	29.9	25.8	3334.2#	88.2#	138.0	138.0	5.4
	East	R2	29.2	25.2	3334.2#	90.1#	121.5	121.5	4.8
East: Greenbag Road									
	South	L2	33.2	32.2	3400.3#	72.0#	21.7	21.7	0.7
	West	T1	33.2	33.1	3335.0#	68.8#	326.8	326.8	9.9
	North	R2	32.3	32.2	3335.0#	70.6#	13.0	13.0	0.4
North: Dorsey Avenue									
	East	L2	33.8	31.9	3315.1#	70.9#	58.0	58.0	1.8
	South	T1	33.8	31.9	3315.1#	70.8#	17.7	17.7	0.6
	West	R2	32.8	31.0	3315.1#	72.8#	105.8	105.8	3.4
West: Greenbag Road									
	North	L2	33.8	33.8	3400.3#	68.6#	48.3	48.3	1.4
	East	T1	35.8	35.8	3331.9#	63.4#	252.4	252.4	7.0
	South	R2	34.4	34.4	3331.9#	66.1#	24.0	24.0	0.7
ALL VEHICLES:			32.7	30.6	3334.8#	74.4#	1258.4	1258.4	41.2

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA
West: Greenbag Road								

```
            North    L2      51.0   14.8  200.3   1600     488     NA
             East    T1     144.0   22.0  138.3   1600     488     NA
            South    R2      83.8   17.9   58.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph       mph       sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     18.5      9.5
    8  T1     40.0   22.0   22.0  40.0     18.5      4.7
   18  R2     40.0   19.0   19.0  40.0     18.5      4.3
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     17.7      9.6
    6  T1     40.0   22.0   22.0  40.0     21.3      4.8
   16  R2     40.0   17.9   17.9  40.0     21.3      4.6
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     17.5      9.5
    4  T1     40.0   22.0   22.0  40.0     17.5      4.7
   14  R2     40.0   19.0   19.0  40.0     17.5      4.3
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     23.9      9.5
    2  T1     40.0   22.0   22.0  40.0     32.8      4.7
   12  R2     40.0   17.9   17.9  40.0     32.8      4.6
-----------------------------------------------------------
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #     208    567    601     216   0.85    -11  0.960*
    8  T1  #     218    567    601     227   0.85    -11  0.960*
   18  R2  #     192    567    601     200   0.85    -11  0.960*
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #      34    501    511     402   0.85    913  0.084
    6  T1  #     517    501    511     698   0.85     15  0.742
   16  R2  #      21    501    511      28   0.85     15  0.742
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #      92    759    799     157   0.85     45  0.587
    4  T1  #      28    759    799      48   0.85     45  0.587
   14  R2  #     168    759    799     287   0.85     45  0.587
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #      75    154    156     582   0.85    559  0.129
    2  T1  #     400    154    156     909   0.85     93  0.440
   12  R2  #      38    154    156      86   0.85     93  0.440
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   2.06    2.47    35.7   1.51   313.8 21.50    131.1     5.1     25.7
    8  T1   1.87    2.25    30.9   1.51   330.2 21.58    138.0     5.4     25.8
   18  R2   1.63    1.95    30.4   1.51   290.8 20.70    121.5     4.8     25.2
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.14    0.16    14.6   0.82    27.5  1.11     21.7     0.7     32.2
    6  T1   1.85    2.22    12.9   1.06   548.5 19.49    326.8     9.9     33.1
   16  R2   0.07    0.08    12.2   1.06    21.9  3.73     13.0     0.4     32.2
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

```
    7  L2   0.46    0.56    18.1   1.01    93.3  4.03     58.0     1.8     31.9
    4  T1   0.10    0.12    13.2   1.01    28.6  2.30     17.7     0.6     31.9
   14  R2   0.65    0.78    13.9   1.01   170.2  7.43    105.8     3.4     31.0
--------------------------------------------------------------------------------
West: Greenbag Road
    5  L2   0.24    0.28    11.3   0.68    50.8  2.15     48.3     1.4     33.8
    2  T1   0.64    0.77     5.8   0.53   213.3 10.31    252.4     7.0     35.8
   12  R2   0.06    0.07     5.8   0.53    20.3  2.95     24.0     0.7     34.4
--------------------------------------------------------------------------------
```

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Total   Total    Total    Total    Total   Total
                  $/h     gal/h    kg/h     kg/h     kg/h    kg/h
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2          75.96    4.2    37.5    0.04    0.004   0.026
    8  T1          79.94    4.4    39.5    0.04    0.004   0.027
   18  R2          71.26    5.7    50.8    0.06    0.005   0.039
                 ---------------------------------------------
                 227.15   14.3   127.7    0.14    0.013   0.092
-----------------------------------------------------------------
East: Greenbag Road
    1  L2          13.36    1.9    17.5    0.02    0.001   0.055
    6  T1         132.22    7.9    71.2    0.09    0.008   0.109
   16  R2           5.28    0.3     2.8    0.00    0.000   0.004
                 ---------------------------------------------
                 150.85   10.2    91.5    0.11    0.010   0.169
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2          35.18    4.2    37.2    0.04    0.003   0.081
    4  T1          10.89    1.5    13.8    0.02    0.001   0.026
   14  R2          63.45    6.1    55.2    0.06    0.005   0.147
                 ---------------------------------------------
                 109.52   11.8   106.1    0.12    0.010   0.255
-----------------------------------------------------------------
West: Greenbag Road
    5  L2          26.71    2.4    22.0    0.02    0.002   0.067
    2  T1         147.42   21.5   194.9    0.19    0.015   0.737
   12  R2          14.45    2.9    27.0    0.02    0.002   0.126
                 ---------------------------------------------
                 188.58   26.9   243.9    0.24    0.019   0.929
-----------------------------------------------------------------
 INTERSECTION:   676.11   63.3   569.3    0.60    0.052   1.444
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Rate    Eff.     Rate     Rate     Rate    Rate
                  $/mi    mpg      g/km     g/km     g/km    g/km
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2           0.36   31.1   177.7    0.18    0.018   0.121
    8  T1           0.36   31.1   177.7    0.18    0.018   0.121
   18  R2           0.36   21.4   259.6    0.32    0.025   0.202
                 ---------------------------------------------
                    0.36   27.3   203.2    0.23    0.020   0.146
-----------------------------------------------------------------
East: Greenbag Road
    1  L2           0.38   11.2   500.6    0.50    0.042   1.584
    6  T1           0.25   41.2   135.4    0.16    0.015   0.208
   16  R2           0.25   41.6   133.7    0.15    0.014   0.185
                 ---------------------------------------------
                    0.26   35.5   157.2    0.18    0.017   0.290
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2           0.38   14.0   398.5    0.45    0.037   0.865
    4  T1           0.38   11.5   483.0    0.56    0.047   0.925
   14  R2           0.37   17.2   324.0    0.34    0.032   0.866
                 ---------------------------------------------
                    0.37   15.3   363.3    0.40    0.035   0.872
-----------------------------------------------------------------
West: Greenbag Road
    5  L2           0.34   19.7   283.2    0.29    0.027   0.859
    2  T1           0.36   11.7   479.8    0.47    0.037   1.813
   12  R2           0.37    8.2   699.0    0.59    0.047   3.259
                 ---------------------------------------------
                    0.36   12.1   466.8    0.45    0.036   1.778
-----------------------------------------------------------------
 INTERSECTION:      0.33   19.9   281.1    0.30    0.026   0.713
-----------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	618	644	0.960	32.3	1.51	17.9	451.7	1600.0
East: Greenbag Road								
1	34	402	0.084	14.6	0.82	0.3	9.0	200.0
2	538	726	0.742	12.8	1.06	8.0	210.2	1600.0
North: Dorsey Avenue								
1	289	493	0.587	15.2	1.01	4.0	104.2	1600.0
West: Greenbag Road								
1	75	582	0.129	11.3	0.68	0.5	13.9	200.0
2	438	995	0.440	5.8	0.53	2.7	71.7	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	618	150	644	0.960	100
East: Greenbag Road					
1	34	34	402	0.084	100
2	538	150	726	0.742	100
North: Dorsey Avenue					
1	289	150	493	0.587	100
West: Greenbag Road					
1	75	75	582	0.129	100
2	438	150	995	0.440	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	618	1		0.960	32.3	452	1600
	618	1		0.960	32.3	452	
East: Greenbag Road							
1	34	5		0.084	14.6	9	200
2	538	7		0.742	12.8	210	1600
	572	7		0.742	13.0	210	
North: Dorsey Avenue							
1	289	6		0.587	15.2	104	1600
	289	6		0.587	15.2	104	
West: Greenbag Road							
1	75	8		0.129	11.3	14	200
2	438	8		0.440	5.8	72	1600
	513	8		0.440	6.6	72	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
1992	5	0.960	17.6	452

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout

-----------------------------------------------------
                                      Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy     Spacing  Space    Time
          mph     veh/h    sec       ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1        18.7    1140     3.16     86.42    25.20    2.24
-----------------------------------------------------
 East: Greenbag Road
 1        14.8     810     4.44     96.61    26.00    3.25
 2        21.8    1242     2.90     92.73    26.35    2.07
-----------------------------------------------------
 North: Dorsey Avenue
 1        17.9    1108     3.25     85.47    26.28    2.25
-----------------------------------------------------
 West: Greenbag Road
 1        14.8     740     4.87    105.77    26.60    3.64
 2        21.6    1174     3.07     97.26    26.54    2.23
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green             dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1       0.960    NA      NA      2.6   7.2  18.9  26.2   4.7  21.4   9.1  12.3   6.2   32.3
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1       0.084    NA      NA      4.1   5.0   0.0   5.0   2.8   2.2   0.0   2.2   9.6   14.6
 2       0.742    NA      NA      2.0   4.4   3.7   8.1   5.6   2.5   2.2   0.3   4.8   12.8
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1       0.587    NA      NA      3.8   6.4   2.8   9.2   3.6   5.6   1.6   4.0   6.0   15.2
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1       0.129    NA      NA      1.3   1.8   0.0   1.8   1.7   0.0   0.0   0.0   9.5   11.3
 2       0.440    NA      NA      0.5   1.1   0.0   1.1   2.6   0.0   0.0   0.0   4.7    5.8
-------------------------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ------------------------    Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.960    NA      NA     3.3    3.1   4.2    7.2   17.9  0.11   0.28    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.084    NA      NA     0.0    0.1   0.0    0.1    0.3  0.02   0.05    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
2	0.742	NA	NA	0.6	2.3	0.9	3.2	8.0	0.05	0.13	0.0	NA
North: Dorsey Avenue												
1	0.587	NA	NA	0.3	1.3	0.3	1.6	4.0	0.03	0.07	0.0	NA
West: Greenbag Road												
1	0.129	NA	NA	0.0	0.2	0.0	0.2	0.5	0.03	0.07	0.0	NA
2	0.440	NA	NA	0.0	1.1	0.0	1.1	2.7	0.02	0.04	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.960	NA	NA	82.2	77.1	104.6	181.7	451.7	0.11	0.28	0.0	NA
East: Greenbag Road												
1	0.084	NA	NA	0.0	3.6	0.0	3.6	9.0	0.02	0.05	0.0	NA
2	0.742	NA	NA	16.3	61.7	22.9	84.6	210.2	0.05	0.13	0.0	NA
North: Dorsey Avenue												
1	0.587	NA	NA	7.3	34.4	7.5	41.9	104.2	0.03	0.07	0.0	NA
West: Greenbag Road												
1	0.129	NA	NA	0.0	5.6	0.0	5.6	13.9	0.03	0.07	0.0	NA
2	0.440	NA	NA	0.0	28.8	0.0	28.8	71.7	0.02	0.04	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.960	NA	NA	3.3	4.5	8.2
East: Greenbag Road						
1	0.084	NA	NA	0.0	0.0	0.1
2	0.742	NA	NA	0.6	1.2	2.2
North: Dorsey Avenue						
1	0.587	NA	NA	0.3	0.7	1.3
West: Greenbag Road						
1	0.129	NA	NA	0.0	0.0	0.1
2	0.440	NA	NA	0.0	0.1	0.2

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.960	NA	NA	82.2	113.2	205.4
East: Greenbag Road						
1	0.084	NA	NA	0.0	1.2	2.2
2	0.742	NA	NA	16.3	31.8	57.8
North: Dorsey Avenue						
1	0.587	NA	NA	7.3	19.3	35.1
West: Greenbag Road						
1	0.129	NA	NA	0.0	1.0	1.8
2	0.440	NA	NA	0.0	3.5	6.3

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.960	7.2	9.3	13.2	15.2	17.9	19.9	21.4
East: Greenbag Road								
1	0.084	0.1	0.2	0.3	0.3	0.3	0.4	0.4
2	0.742	3.2	4.2	5.9	6.8	8.0	8.9	9.5
North: Dorsey Avenue								
1	0.587	1.6	2.1	2.9	3.4	4.0	4.4	4.7
West: Greenbag Road								
1	0.129	0.2	0.3	0.4	0.4	0.5	0.6	0.6
2	0.440	1.1	1.4	2.0	2.3	2.7	3.0	3.2

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.960	181.7	235.3	331.7	384.1	451.7	501.3	538.9
East: Greenbag Road								
1	0.084	3.6	4.7	6.6	7.7	9.0	10.0	10.8
2	0.742	84.5	109.5	154.3	178.7	210.2	233.3	250.7
North: Dorsey Avenue								
1	0.587	41.9	54.3	76.5	88.6	104.2	115.6	124.3
West: Greenbag Road								
1	0.129	5.6	7.3	10.2	11.8	13.9	15.5	16.6
2	0.440	28.8	37.3	52.7	61.0	71.7	79.6	85.5

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.960	NA	NA	1.00	0.51	0.00	1.51	934.8	1.42	881.1	1.00	2.42
East: Greenbag Road												
1	0.084	NA	NA	0.55	0.00	0.26	0.82	27.5	0.00	0.0	0.60	0.60
2	0.742	NA	NA	0.90	0.13	0.04	1.06	570.3	0.31	167.7	0.91	1.22
North: Dorsey Avenue												
1	0.587	NA	NA	0.82	0.09	0.10	1.01	292.1	0.26	74.8	0.82	1.08
West: Greenbag Road												
1	0.129	NA	NA	0.26	0.00	0.42	0.68	50.8	0.00	0.0	0.37	0.37
2	0.440	NA	NA	0.29	0.00	0.25	0.53	233.6	0.00	0.0	0.43	0.43

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To: / Turn:	W L2	N T1	E R2	TOT
Flow Rate	207.6	218.5	192.4	618.5
%HV (all designations)	1.0	1.0	1.0	1.0

From EAST To: / Turn:	S L2	W T1	N R2	TOT
Flow Rate	33.7	517.4	20.7	571.7
%HV (all designations)	5.0	7.0	0.0	6.6

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	168.5	289.1
%HV (all designations)	0.0	0.0	11.0	6.4

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	75.0	400.0	38.0	513.0
%HV (all designations)	8.0	7.0	15.0	7.7

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	205.5	216.3	190.5	612.3
Mov Class %	99.0	99.0	99.0	99.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	32.0	481.2	20.7	533.8
Mov Class %	95.0	93.0	100.0	93.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	149.9	270.6
Mov Class %	100.0	100.0	89.0	93.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	69.0	372.0	32.3	473.3
Mov Class %	92.0	93.0	85.0	92.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	2.1	2.2	1.9	6.2
Mov Class %	1.0	1.0	1.0	1.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	1.7	36.2	0.0	37.9
Mov Class %	5.0	7.0	0.0	6.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	18.5	18.5
Mov Class %	0.0	0.0	11.0	6.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	6.0	28.0	5.7	39.7

Mov Class %	8.0	7.0	15.0	7.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	205.5	216.3	190.5	612.3
HV	2.1	2.2	1.9	6.2
Total	207.6	218.5	192.4	618.5
Approach	207.6	218.5	192.4	618.5

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	32.0	*	*	32.0
HV	1.7	*	*	1.7
Total	33.7	*	*	33.7
Lane 2				
LV	*	481.2	20.7	501.8
HV	*	36.2	*	36.2
Total	*	517.4	20.7	538.0
Approach	33.7	517.4	20.7	571.7

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	92.4	28.3	149.9	270.6
HV	*	*	18.5	18.5
Total	92.4	28.3	168.5	289.1
Approach	92.4	28.3	168.5	289.1

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	69.0	*	*	69.0
HV	6.0	*	*	6.0
Total	75.0	*	*	75.0
Lane 2				
LV	*	372.0	32.3	404.3
HV	*	28.0	5.7	33.7
Total	*	400.0	38.0	438.0
Approach	75.0	400.0	38.0	513.0

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT
Exit: SOUTH			
Lane: 1	92.6	7.4	100.0
Total	92.6	7.4	100.0
Exit: EAST			
Lane: 1	654.9	29.9	684.8
Total	654.9	29.9	684.8
Exit: NORTH			
Lane: 1	305.9	8.2	314.1
Total	305.9	8.2	314.1
Exit: WEST			
Lane: 1	836.7	56.8	893.5
Total	836.7	56.8	893.5

* Movement not allocated to the lane

DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

```
-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
Lane:  1           654.9    29.9   684.8
Total              654.9    29.9   684.8
-----------------------------------------
 Exit: NORTH
Lane:  1           305.9     8.2   314.1
Total              305.9     8.2   314.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   2.9%
  Number of Iterations: 7 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     2.3%   1.2%   0.6%

Other Diagnostic Messages (if any):
```

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SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:16:11 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2A - Greenbag & Dorsey-Kingwood With Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

MOVEMENT SUMMARY

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	79	4.0	0.533	18.3	LOS B	3.3	84.1	0.83	0.99	1.04	32.1
8	T1	88	3.0	0.533	13.3	LOS B	3.3	84.1	0.83	0.99	1.04	32.2
18	R2	75	2.0	0.533	12.8	LOS B	3.3	84.1	0.83	0.99	1.04	31.3
Approach		242	3.0	0.533	14.8	LOS B	3.3	84.1	0.83	0.99	1.04	31.9
East: Greenbag Road												
1	L2	131	0.0	0.237	12.9	LOS B	1.0	25.4	0.52	0.79	0.52	33.1
6	T1	471	1.0	0.532	7.2	LOS A	3.6	89.9	0.61	0.68	0.64	35.4
16	R2	34	0.0	0.532	7.0	LOS A	3.6	89.9	0.61	0.68	0.64	34.3
Approach		636	0.7	0.532	8.4	LOS A	3.6	89.9	0.59	0.70	0.61	34.8
North: Dorsey Avenue												
7	L2	149	1.0	0.883	25.1	LOS C	10.8	271.9	0.96	1.27	1.79	29.3
4	T1	238	0.0	0.883	20.1	LOS C	10.8	271.9	0.96	1.27	1.79	29.4
14	R2	162	2.0	0.883	19.9	LOS B	10.8	271.9	0.96	1.27	1.79	28.7
Approach		549	0.9	0.883	21.4	LOS C	10.8	271.9	0.96	1.27	1.79	29.2
West: Greenbag Road												
5	L2	164	0.0	0.376	15.7	LOS B	1.9	47.5	0.69	0.91	0.74	31.8
2	T1	584	1.0	0.950	25.7	LOS C	20.6	517.0	1.00	1.44	2.10	27.8
12	R2	166	0.0	0.950	25.5	LOS C	20.6	517.0	1.00	1.44	2.10	27.2
Approach		915	0.6	0.950	23.9	LOS C	20.6	517.0	0.94	1.34	1.86	28.3
All Vehicles		2342	1.0	0.950	18.2	LOS B	20.6	517.0	0.84	1.11	1.42	30.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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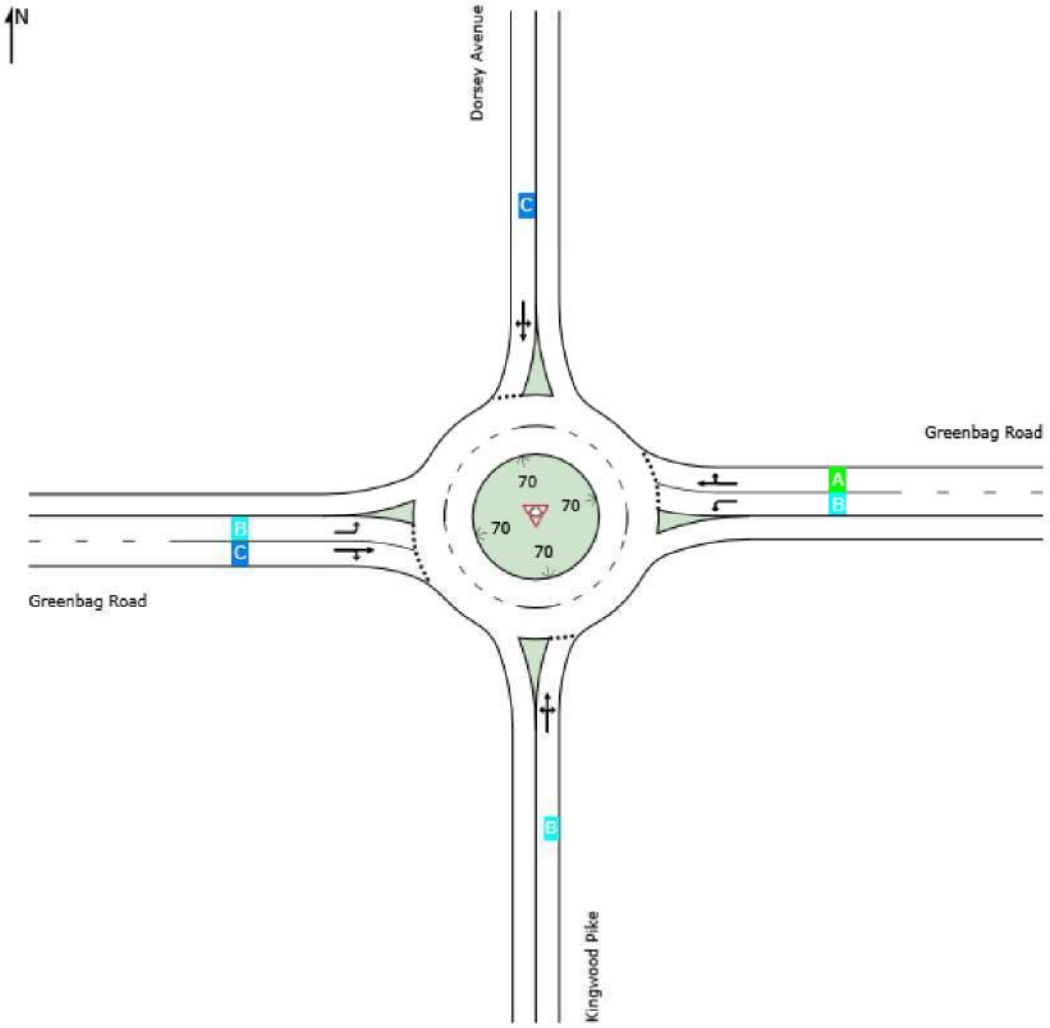
LANE LEVEL OF SERVICE

Lane Level of Service

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	C	C	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

QUEUE DISTANCE (%ILE)

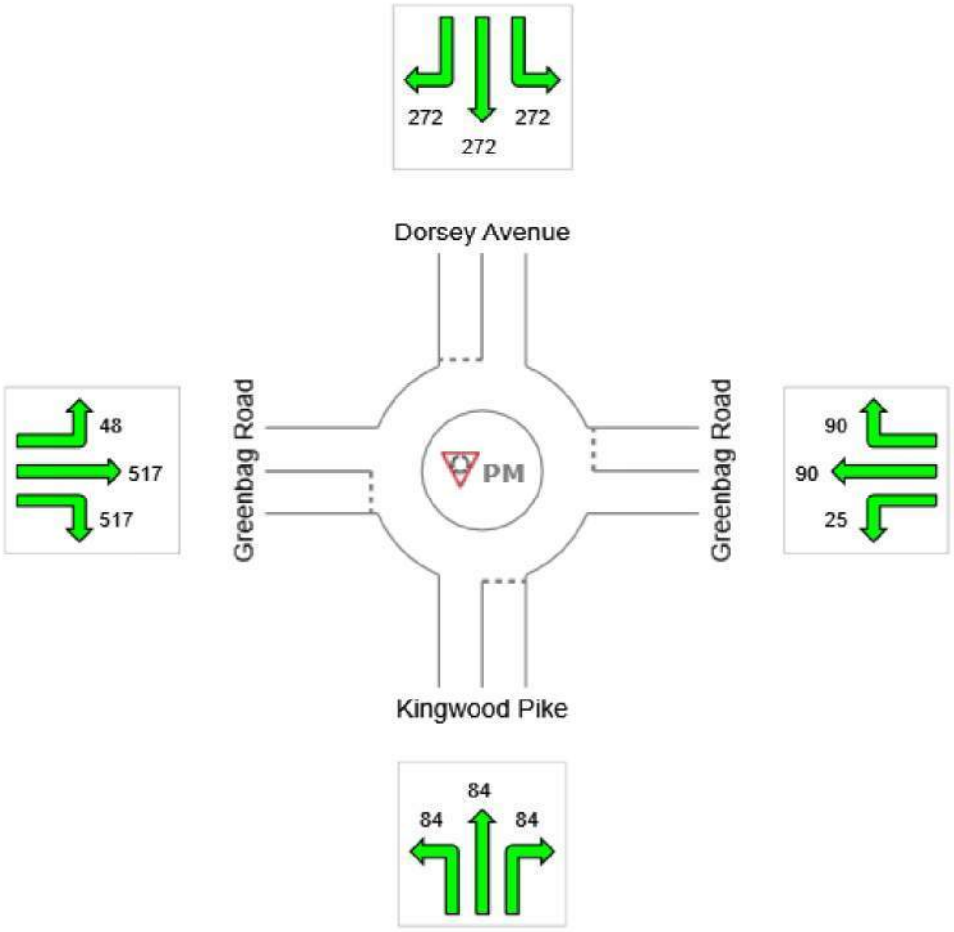
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	84	90	272	517	517



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
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- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	898	1.01	905	0.0	0.0	N	0.809	19.5	1.45	0.559
N	T1	1	Dominant	898	1.01	905	0.0	0.0	N	0.809	19.5	1.45	0.559
E	R2	1	Dominant	898	1.01	905	0.0	0.0	N	0.809	19.5	1.45	0.559
East: Greenbag Road													
S	L2	1	Subdominant	330	1.02	336	0.0	0.0	N	0.964	16.7	2.00	0.336
W	T1	2	Dominant	330	1.02	336	0.0	0.0	N	0.964	16.7	2.00	0.336
N	R2	2	Dominant	330	1.02	336	0.0	0.0	N	0.964	16.7	2.00	0.336

North: Dorsey Avenue											
E	L2	1	Dominant	681	1.01	689	0.0	0.0	N	0.913	19.8	1.44	0.455
S	T1	1	Dominant	681	1.01	689	0.0	0.0	N	0.913	19.8	1.44	0.455
W	R2	1	Dominant	681	1.01	689	0.0	0.0	N	0.913	19.8	1.44	0.455
West: Greenbag Road											
N	L2	1	Subdominant	519	1.00	521	0.0	0.0	N	0.897	18.1	2.00	0.472
E	T1	2	Dominant	519	1.00	521	0.0	0.0	N	0.897	18.1	2.00	0.472
S	R2	2	Dominant	519	1.00	521	0.0	0.0	N	0.897	18.1	2.00	0.472

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.45	0.559	Y	1.04	4.48	128.0	3.13
N	T1	1	Dominant	1.45	0.559	Y	1.03	4.44	126.8	3.10
E	R2	1	Dominant	1.45	0.559	Y	1.02	4.40	125.6	3.07
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.336	N	1.00	6.30	154.5	4.28
W	T1	2	Dominant	2.00	0.336	Y	1.01	4.14	101.4	2.81
N	R2	2	Dominant	2.00	0.336	Y	1.00	4.10	100.4	2.78
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.44	0.455	Y	1.01	4.30	124.5	3.12
S	T1	1	Dominant	1.44	0.455	Y	1.00	4.25	123.3	3.09
W	R2	1	Dominant	1.44	0.455	Y	1.02	4.34	125.8	3.16
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.472	Y	1.00	5.99	159.1	4.23
E	T1	2	Dominant	2.00	0.472	Y	1.01	3.89	103.2	2.74
S	R2	2	Dominant	2.00	0.472	Y	1.00	3.85	102.1	2.71

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway
is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two
successive vehicles across all lanes in the circulating
or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	164	164	18.1%
2	734	741	81.9%
Total	898	905	
East: Greenbag Road			
1	0	0	0.0%
2	330	336	100.0%
Total	330	336	
North: Dorsey Avenue			
1	131	131	19.1%
2	549	557	80.9%
Total	680	688	
West: Greenbag Road			
1	0	0	0.0%
2	519	521	100.0%
Total	519	521	

The SIDRA Standard roundabout capacity model option is in use.
This model takes into account the total circulating flow as well as the effect

of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	75	167	242
Total	75	167	242
East: Greenbag Road			
1	0	131	131
2	34	470	504
Total	34	601	635
North: Dorsey Avenue			
1	162	387	549
Total	162	387	549
West: Greenbag Road			
1	0	164	164
2	166	585	751
Total	166	749	915

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	33.7	32.1	3333.1#	70.8#	49.6	49.6	1.5
	North	T1	33.8	32.2	3333.1#	70.6#	55.3	55.3	1.7
	East	R2	32.9	31.3	3333.1#	72.5#	47.5	47.5	1.5
East: Greenbag Road									
	South	L2	33.6	33.1	3400.3#	70.0#	84.7	84.7	2.6
	West	T1	35.4	35.4	3332.9#	64.3#	297.2	297.2	8.4
	North	R2	34.3	34.3	3332.9#	66.2#	21.3	21.3	0.6
North: Dorsey Avenue									
	East	L2	31.6	29.3	3331.8#	77.4#	94.3	94.3	3.2
	South	T1	31.7	29.4	3331.8#	77.2#	150.3	150.3	5.1
	West	R2	30.9	28.7	3331.8#	79.1#	102.1	102.1	3.6
West: Greenbag Road									
	North	L2	33.1	31.8	3400.3#	72.8#	105.6	105.6	3.3
	East	T1	30.7	27.8	3320.5#	81.4#	367.4	367.4	13.2
	South	R2	29.9	27.2	3320.5#	83.3#	104.6	104.6	3.8
ALL VEHICLES:			32.4	30.4	3337.2#	74.7#	1480.0	1480.0	48.6

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA
West: Greenbag Road								

```
            North    L2      51.0   14.8  200.3   1600     488     NA
             East    T1     144.0   22.0  138.3   1600     488     NA
            South    R2      83.8   17.9   58.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph       mph       sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     16.6      9.6
    8  T1     40.0   22.0   22.0  40.0     16.6      4.7
   18  R2     40.0   19.0   19.0  40.0     16.6      4.3
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     20.2      9.5
    6  T1     40.0   22.0   22.0  40.0     24.4      4.7
   16  R2     40.0   17.9   17.9  40.0     24.4      4.6
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     17.8      9.5
    4  T1     40.0   22.0   22.0  40.0     17.8      4.7
   14  R2     40.0   19.0   19.0  40.0     17.8      4.3
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     17.6      9.5
    2  T1     40.0   22.0   22.0  40.0     21.2      4.7
   12  R2     40.0   17.9   17.9  40.0     21.2      4.6
-----------------------------------------------------------
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      79    898    905     147   0.85     59  0.533
    8  T1  #      88    898    905     164   0.85     59  0.533
   18  R2  #      75    898    905     141   0.85     59  0.533
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #     131    330    336     554   0.85    258  0.237
    6  T1  #     471    330    336     884   0.85     60  0.532
   16  R2  #      34    330    336      63   0.85     60  0.532
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     149    681    689     169   0.85     -4  0.883
    4  T1  #     238    681    689     270   0.85     -4  0.883
   14  R2  #     162    681    689     183   0.85     -4  0.883
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #     164    519    521     436   0.85    126  0.376
    2  T1  #     584    519    521     615   0.85    -10  0.950*
   12  R2  #     166    519    521     175   0.85    -10  0.950*
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.40    0.48    18.3   0.99    77.9  4.72     49.6     1.5     32.1
    8  T1   0.32    0.39    13.3   0.99    86.8  4.83     55.3     1.7     32.2
   18  R2   0.27    0.32    12.8   0.99    74.5  4.51     47.5     1.5     31.3
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.47    0.56    12.9   0.79   103.7  3.57     84.7     2.6     33.1
    6  T1   0.94    1.13     7.2   0.68   319.2 13.02    297.2     8.4     35.4
   16  R2   0.07    0.08     7.0   0.68    22.9  2.16     21.3     0.6     34.3
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

```
    7  L2   1.04    1.25    25.1   1.27   189.3 13.14     94.3     3.2     29.3
    4  T1   1.33    1.60    20.1   1.27   301.8 11.11    150.3     5.1     29.4
   14  R2   0.90    1.07    19.9   1.27   205.0 13.28    102.1     3.6     28.7
--------------------------------------------------------------------------------
West: Greenbag Road
    5  L2   0.72    0.86    15.7   0.91   150.1  4.96    105.6     3.3     31.8
    2  T1   4.18    5.01    25.7   1.44   839.5 34.57    367.4    13.2     27.8
   12  R2   1.18    1.42    25.5   1.44   238.9 13.39    104.6     3.8     27.2
--------------------------------------------------------------------------------
```

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Total   Total    Total    Total    Total   Total
                  $/h     gal/h    kg/h     kg/h     kg/h    kg/h
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2          22.83    1.5    13.2     0.01    0.001   0.017
    8  T1          25.44    1.7    14.7     0.02    0.002   0.018
   18  R2          22.20    2.2    19.3     0.02    0.002   0.025
                 ---------------------------------------------
                  70.47    5.3    47.3     0.05    0.005   0.060
-----------------------------------------------------------------
East: Greenbag Road
    1  L2          43.54    5.5    48.7     0.06    0.005   0.024
    6  T1         104.29    5.8    52.0     0.06    0.005   0.023
   16  R2           7.47    0.4     3.7     0.00    0.000   0.002
                 ---------------------------------------------
                 155.30   11.7   104.5     0.12    0.011   0.049
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2          58.15    6.4    56.8     0.07    0.006   0.051
    4  T1          93.73   12.3   109.5     0.14    0.012   0.084
   14  R2          62.23    5.4    48.1     0.05    0.005   0.043
                 ---------------------------------------------
                 214.11   24.1   214.4     0.26    0.023   0.179
-----------------------------------------------------------------
West: Greenbag Road
    5  L2          58.08    4.3    38.0     0.04    0.004   0.016
    2  T1         227.68   24.2   215.6     0.26    0.022   0.206
   12  R2          65.53    8.4    74.6     0.09    0.008   0.060
                 ---------------------------------------------
                 351.28   36.8   328.2     0.40    0.034   0.282
-----------------------------------------------------------------
 INTERSECTION:   791.16   77.9   694.4     0.84    0.072   0.569
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Rate    Eff.     Rate     Rate     Rate    Rate
                  $/mi    mpg      g/km     g/km     g/km    g/km
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2           0.29   33.5   165.8     0.18    0.017   0.208
    8  T1           0.29   33.5   165.5     0.18    0.017   0.205
   18  R2           0.29   22.1   252.3     0.31    0.023   0.328
                 ---------------------------------------------
                    0.29   28.9   192.7     0.22    0.019   0.244
-----------------------------------------------------------------
East: Greenbag Road
    1  L2           0.32   15.4   357.8     0.45    0.038   0.178
    6  T1           0.22   50.9   108.8     0.12    0.011   0.048
   16  R2           0.22   51.0   108.6     0.12    0.011   0.045
                 ---------------------------------------------
                    0.24   34.3   161.1     0.19    0.016   0.075
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2           0.38   14.8   374.1     0.46    0.038   0.338
    4  T1           0.39   12.2   452.8     0.56    0.048   0.349
   14  R2           0.38   18.9   292.5     0.33    0.032   0.261
                 ---------------------------------------------
                    0.38   14.4   384.2     0.47    0.041   0.320
-----------------------------------------------------------------
West: Greenbag Road
    5  L2           0.34   24.7   223.6     0.25    0.024   0.096
    2  T1           0.39   15.2   364.5     0.44    0.037   0.348
   12  R2           0.39   12.5   443.5     0.55    0.047   0.358
                 ---------------------------------------------
                    0.38   15.7   353.0     0.43    0.036   0.303
-----------------------------------------------------------------
 INTERSECTION:      0.33   19.0   291.5     0.35    0.030   0.239
-----------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	242	453	0.533	14.8	0.99	3.3	84.1	1600.0
East: Greenbag Road								
1	131	554	0.237	12.9	0.79	1.0	25.4	200.0
2	504	947	0.532	7.2	0.68	3.6	89.9	1600.0
North: Dorsey Avenue								
1	549	622	0.883	21.4	1.27	10.8	271.9	1600.0
West: Greenbag Road								
1	164	436	0.376	15.7	0.91	1.9	47.5	200.0
2	751	790	0.950	25.7	1.44	20.6	517.0	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	242	150	453	0.533	100
East: Greenbag Road					
1	131	131	554	0.237	100
2	504	150	947	0.532	100
North: Dorsey Avenue					
1	549	150	622	0.883	100
West: Greenbag Road					
1	164	150	436	0.376	100
2	751	150	790	0.950	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	242	3		0.533	14.8	84	1600
	242	3		0.533	14.8	84	
East: Greenbag Road							
1	131	0		0.237	12.9	25	200
2	504	1		0.532	7.2	90	1600
	636	1		0.532	8.4	90	
North: Dorsey Avenue							
1	549	1		0.883	21.4	272	1600
	549	1		0.883	21.4	272	
West: Greenbag Road							
1	164	0		0.376	15.7	48	200
2	751	1		0.950	25.7	517	1600
	915	1		0.950	23.9	517	

ALL VEHICLES Total Flow	% HV	Max X	Aver. Delay	Max Queue
2342	1	0.950	18.2	517

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout

-----------------------------------------------------
                                      Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy     Spacing  Space    Time
          mph     veh/h    sec       ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1        18.7    1160     3.10     85.26    25.60    2.17
-----------------------------------------------------
 East: Greenbag Road
 1        14.8     842     4.28     92.98    25.00    3.13
 2        21.7    1282     2.81     89.34    25.19    2.02
-----------------------------------------------------
 North: Dorsey Avenue
 1        19.1    1154     3.12     87.61    25.17    2.22
-----------------------------------------------------
 West: Greenbag Road
 1        14.8     852     4.23     91.85    25.00    3.08
 2        21.1    1317     2.73     84.46    25.16    1.92
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green             dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1       0.533    NA      NA      4.1   6.4   2.3   8.6   3.9   4.7   1.3   3.4   6.2   14.8
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1       0.237    NA      NA      2.3   3.3   0.0   3.3   2.4   0.9   0.0   0.9   9.5   12.9
 2       0.532    NA      NA      1.1   2.2   0.3   2.5   3.7   0.0   0.0   0.0   4.7    7.2
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1       0.883    NA      NA      2.5   6.1   9.4  15.5   4.7  10.8   5.2   5.6   5.9   21.4
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1       0.376    NA      NA      3.8   5.8   0.4   6.2   3.2   3.0   0.3   2.7   9.5   15.7
 2       0.950    NA      NA      1.9   5.5  15.6  21.0   5.8  15.2   7.7   7.5   4.7   25.7
-------------------------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
        Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane   Satn  During  Factor   Queue   ------------------------    Ratio     Block  SL Ov.
 No.      x   Green             No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1     0.533    NA      NA      0.2    1.1   0.2    1.3    3.3  0.02   0.05    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1     0.237    NA      NA      0.0    0.4   0.0    0.4    1.0  0.05   0.13    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
2	0.532	NA	NA	0.1	1.4	0.1	1.4	3.6	0.02	0.06	0.0	NA
North: Dorsey Avenue												
1	0.883	NA	NA	1.5	2.4	1.9	4.3	10.8	0.07	0.17	0.0	NA
West: Greenbag Road												
1	0.376	NA	NA	0.0	0.7	0.0	0.8	1.9	0.10	0.24	0.0	NA
2	0.950	NA	NA	3.2	3.8	4.4	8.3	20.6	0.13	0.32	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.533	NA	NA	4.9	29.3	4.5	33.8	84.1	0.02	0.05	0.0	NA
East: Greenbag Road												
1	0.237	NA	NA	0.0	10.2	0.0	10.2	25.4	0.05	0.13	0.0	NA
2	0.532	NA	NA	1.3	34.2	2.0	36.2	89.9	0.02	0.06	0.0	NA
North: Dorsey Avenue												
1	0.883	NA	NA	37.8	60.8	48.6	109.4	271.9	0.07	0.17	0.0	NA
West: Greenbag Road												
1	0.376	NA	NA	0.8	18.4	0.8	19.1	47.5	0.10	0.24	0.0	NA
2	0.950	NA	NA	80.5	96.1	111.9	208.0	517.0	0.13	0.32	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.533	NA	NA	0.2	0.6	1.0
East: Greenbag Road						
1	0.237	NA	NA	0.0	0.1	0.2
2	0.532	NA	NA	0.1	0.4	0.6
North: Dorsey Avenue						
1	0.883	NA	NA	1.5	2.4	4.3
West: Greenbag Road						
1	0.376	NA	NA	0.0	0.3	0.5
2	0.950	NA	NA	3.2	4.4	8.0

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.533	NA	NA	4.9	14.8	26.9
East: Greenbag Road						
1	0.237	NA	NA	0.0	3.0	5.5
2	0.532	NA	NA	1.3	8.9	16.1
North: Dorsey Avenue						
1	0.883	NA	NA	37.8	59.6	108.1
West: Greenbag Road						
1	0.376	NA	NA	0.8	7.0	12.8
2	0.950	NA	NA	80.5	110.3	200.2

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%

```
 South: Kingwood Pike
 1     0.533    1.3    1.7    2.4    2.8    3.3    3.6    3.9
-------------------------------------------------------------
 East: Greenbag Road
 1     0.237    0.4    0.5    0.7    0.9    1.0    1.1    1.2
 2     0.532    1.4    1.9    2.6    3.0    3.6    4.0    4.3
-------------------------------------------------------------
 North: Dorsey Avenue
 1     0.883    4.3    5.6    7.9    9.2   10.8   12.0   12.9
-------------------------------------------------------------
 West: Greenbag Road
 1     0.376    0.8    1.0    1.4    1.6    1.9    2.1    2.3
 2     0.950    8.3   10.7   15.1   17.5   20.6   22.8   24.5
-------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
  HCM only gives Cycle-Average Queues for unsignalised intersections.


LANE QUEUE PERCENTILES (DISTANCE)

-------------------------------------------------------------
        Deg.           Percentile Back of Queue (feet)
 Lane   Satn  ---------------------------------------------
 No.     x     50%    70%    85%    90%    95%    98%   100%
-------------------------------------------------------------
 South: Kingwood Pike
 1     0.533   33.8   43.8   61.8   71.5   84.1   93.4  100.4
-------------------------------------------------------------
 East: Greenbag Road
 1     0.237   10.2   13.2   18.6   21.6   25.4   28.2   30.3
 2     0.532   36.2   46.8   66.0   76.4   89.9   99.8  107.3
-------------------------------------------------------------
 North: Dorsey Avenue
 1     0.883  109.3  141.6  199.7  231.2  271.9  301.8  324.4
-------------------------------------------------------------
 West: Greenbag Road
 1     0.376   19.1   24.8   34.9   40.4   47.5   52.8   56.7
 2     0.950  207.9  269.3  379.7  439.6  517.0  573.8  616.8
-------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
  HCM only gives Cycle-Average Queues for unsignalised intersections.
```

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout

-------------------------------------------------------------------------------------------------------
                                                                  Queue    Total              Aver.
        Deg.  % Arv   Prog.   -- Effective Stop Rate --  Total  Move-up   Queue     Prop.   Num. of
 Lane   Satn  During  Factor              Geom. Overall  Stops   Rate    Move-ups  Queued  Cycles to
 No.     x    Green            he1   he2   hig     h       H     hqm      Hqm       pq      Depart
-------------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1     0.533    NA      NA    0.83  0.07  0.10   0.99    239.2    0.21     51.1     0.83      1.04
-------------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1     0.237    NA      NA    0.47  0.00  0.32   0.79    103.7    0.00      0.0     0.52      0.52
 2     0.532    NA      NA    0.50  0.01  0.17   0.68    342.1    0.03     13.9     0.61      0.64
-------------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1     0.883    NA      NA    0.96  0.29  0.02   1.27    696.0    0.83    456.4     0.96      1.79
-------------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1     0.376    NA      NA    0.69  0.02  0.21   0.91    150.1    0.04      7.3     0.69      0.74
 2     0.950    NA      NA    0.99  0.44  0.00   1.44   1078.4    1.10    827.8     1.00      2.10
-------------------------------------------------------------------------------------------------------
  hig is the average value for all movements in a shared lane
  hqm is average queue move-up rate for all vehicles queued and unqueued
```

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


TOTAL FLOW RATES for All Movement Classes (veh/h)

-------------------------------------------------------------
 From SOUTH To:                  W       N       E
 Turn:                          L2      T1      R2      TOT
 Flow Rate                    78.7    87.6    75.3    241.6
 %HV (all designations)        4.0     3.0     2.0      3.0
-------------------------------------------------------------
 From EAST To:                   S       W       N
 Turn:                          L2      T1      R2      TOT
 Flow Rate                   131.5   470.8    33.7    636.0
 %HV (all designations)        0.0     1.0     0.0      0.7
```

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	149.4	238.2	161.8	549.4
%HV (all designations)	1.0	0.0	2.0	0.9

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	584.3	166.3	914.6
%HV (all designations)	0.0	1.0	0.0	0.6

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	75.5	85.0	73.8	234.3
Mov Class %	96.0	97.0	98.0	97.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	466.1	33.7	631.2
Mov Class %	100.0	99.0	100.0	99.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	147.9	238.2	158.6	544.7
Mov Class %	99.0	100.0	98.0	99.1
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	578.4	166.3	908.8
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	3.1	2.6	1.5	7.3
Mov Class %	4.0	3.0	2.0	3.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	4.7	0.0	4.7
Mov Class %	0.0	1.0	0.0	0.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	1.5	0.0	3.2	4.7
Mov Class %	1.0	0.0	2.0	0.9
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	5.8	0.0	5.8

```
 Mov Class %           0.0     1.0     0.0     0.6
 Flow Scale           1.00    1.00    1.00       -
 Peak Flow Factor     0.89    0.89    0.89       -
 Residual Demand       0.0     0.0     0.0     0.0
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              75.5    85.0    73.8   234.3
   HV               3.1     2.6     1.5     7.3
   Total           78.7    87.6    75.3   241.6
-------------------------------------------------
 Approach          78.7    87.6    75.3   241.6
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             131.5       *       *   131.5
   Total          131.5       *       *   131.5
 Lane  2
   LV                 *   466.1    33.7   499.8
   HV                 *     4.7       *     4.7
   Total              *   470.8    33.7   504.5
-------------------------------------------------
 Approach         131.5   470.8    33.7   636.0
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             147.9   238.2   158.6   544.7
   HV               1.5       *     3.2     4.7
   Total          149.4   238.2   161.8   549.4
-------------------------------------------------
 Approach         149.4   238.2   161.8   549.4
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             164.0       *       *   164.0
   Total          164.0       *       *   164.0
 Lane  2
   LV                 *   578.4   166.3   744.7
   HV                 *     5.8       *     5.8
   Total              *   584.3   166.3   750.6
-------------------------------------------------
 Approach         164.0   584.3   166.3   914.6
-------------------------------------------------
   *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
   *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
```

```
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   3.9%
  Number of Iterations: 7 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     3.0%   1.5%   0.8%

Other Diagnostic Messages (if any):
```

Go to Table Links (Top)

SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:16:12 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2A - Greenbag & Dorsey-Kingwood With Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

MOVEMENT SUMMARY

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	59	0.0	0.222	12.3	LOS B	1.0	24.2	0.54	0.74	0.54	34.8
8	T1	58	0.0	0.222	7.4	LOS A	1.0	24.2	0.54	0.74	0.54	34.9
18	R2	43	0.0	0.222	7.0	LOS A	1.0	24.2	0.54	0.74	0.54	33.9
Approach		160	0.0	0.222	9.1	LOS A	1.0	24.2	0.54	0.74	0.54	34.6
East: Greenbag Road												
1	L2	63	0.0	0.103	11.5	LOS B	0.4	9.8	0.38	0.69	0.38	33.8
6	T1	260	1.0	0.272	5.7	LOS A	1.3	32.6	0.37	0.53	0.37	36.2
16	R2	24	0.0	0.272	5.6	LOS A	1.3	32.6	0.37	0.53	0.37	35.1
Approach		348	0.7	0.272	6.8	LOS A	1.3	32.6	0.38	0.56	0.38	35.6
North: Dorsey Avenue												
7	L2	48	0.0	0.254	11.6	LOS B	1.1	27.1	0.48	0.69	0.48	35.4
4	T1	64	0.0	0.254	6.8	LOS A	1.1	27.1	0.48	0.69	0.48	35.5
14	R2	86	3.0	0.254	6.5	LOS A	1.1	27.1	0.48	0.69	0.48	34.5
Approach		198	1.3	0.254	7.8	LOS A	1.1	27.1	0.48	0.69	0.48	35.0
West: Greenbag Road												
5	L2	92	3.0	0.150	11.4	LOS B	0.6	15.1	0.37	0.69	0.37	33.8
2	T1	329	1.0	0.382	5.7	LOS A	2.0	51.6	0.38	0.53	0.38	36.2
12	R2	80	2.0	0.382	5.6	LOS A	2.0	51.6	0.38	0.53	0.38	35.0
Approach		500	1.5	0.382	6.7	LOS A	2.0	51.6	0.38	0.56	0.38	35.5
All Vehicles		1206	1.1	0.382	7.2	LOS A	2.0	51.6	0.42	0.60	0.42	35.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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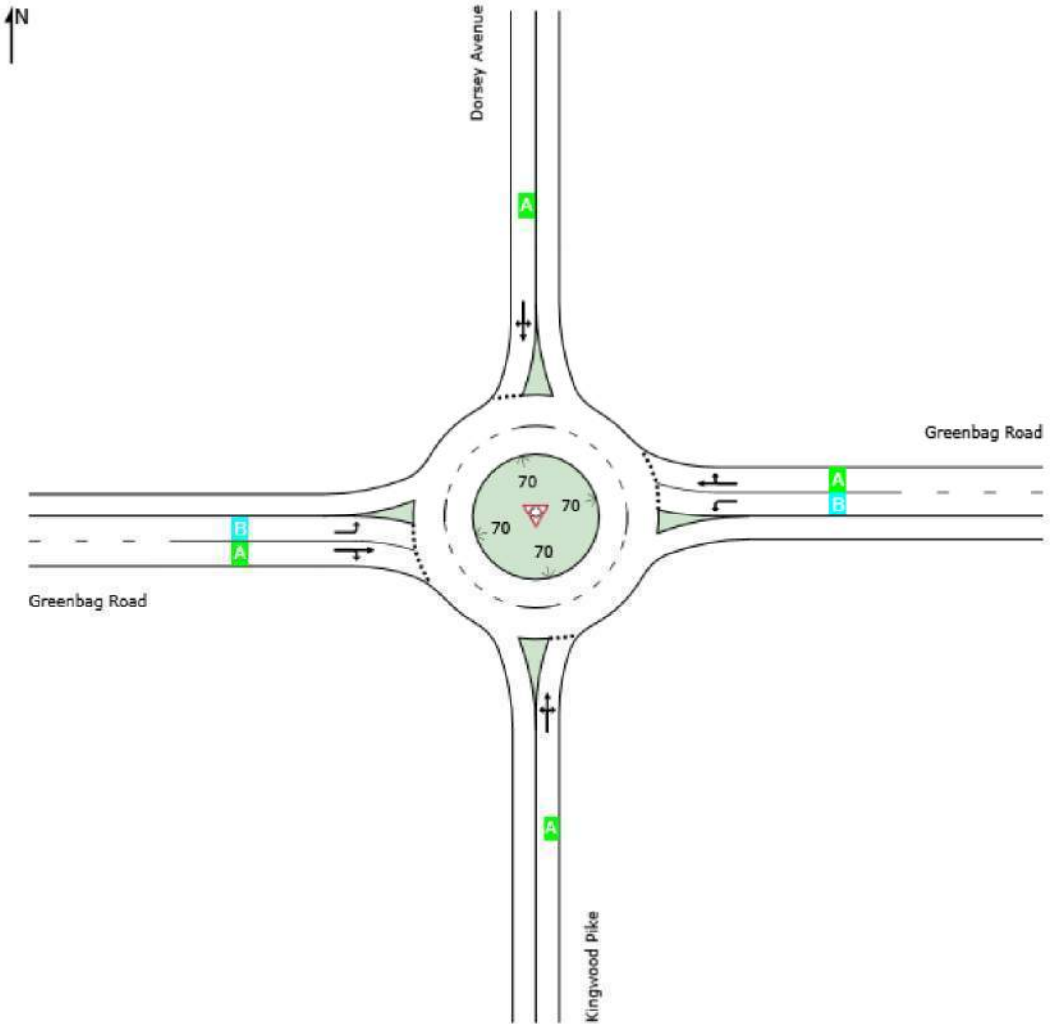
LANE LEVEL OF SERVICE

Lane Level of Service

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

QUEUE DISTANCE (%ILE)

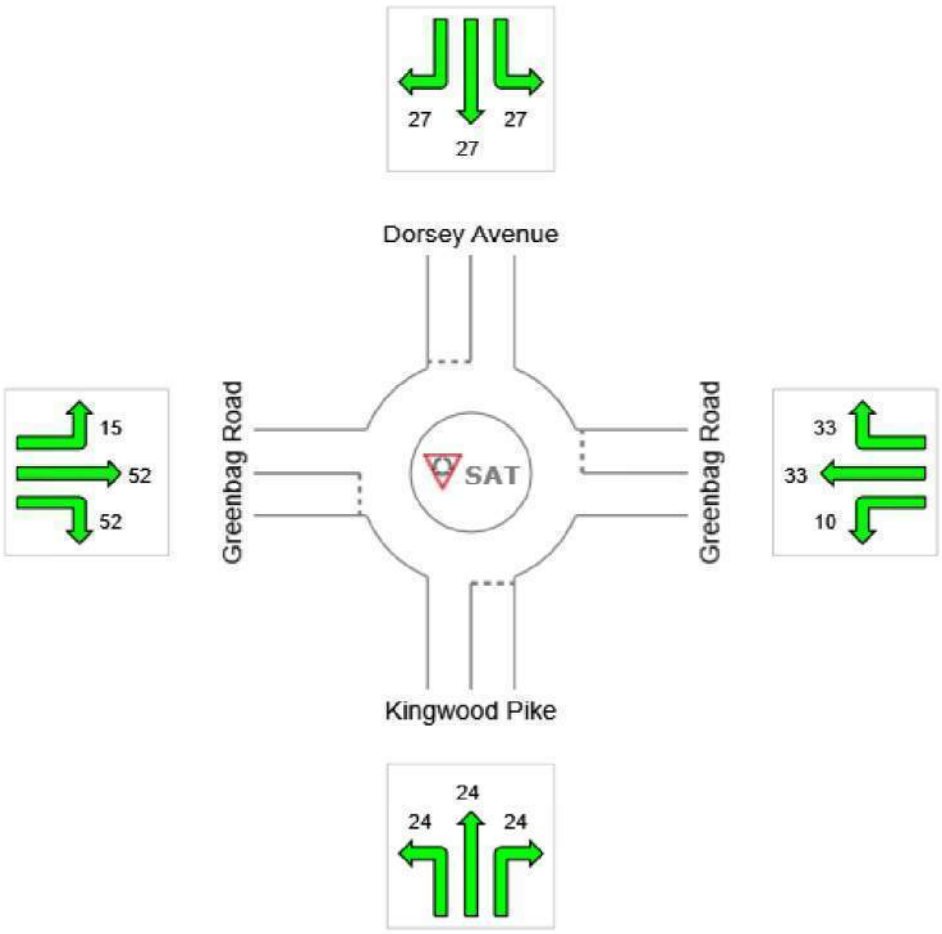
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	24	33	27	52	52



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
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- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	468	1.01	474	0.0	0.0	N	0.963	19.8	1.43	0.337
N	T1	1	Dominant	468	1.01	474	0.0	0.0	N	0.963	19.8	1.43	0.337
E	R2	1	Dominant	468	1.01	474	0.0	0.0	N	0.963	19.8	1.43	0.337
East: Greenbag Road													
S	L2	1	Subdominant	209	1.01	212	0.0	0.0	N	0.984	16.8	2.00	0.227
W	T1	2	Dominant	209	1.01	212	0.0	0.0	N	0.984	16.8	2.00	0.227

N	R2	2 Dominant	209	1.01	212	0.0	0.0	N	0.984	16.8	2.00	0.227
North: Dorsey Avenue												
E	L2	1 Dominant	383	1.01	385	0.0	0.0	N	0.972	19.7	1.48	0.293
S	T1	1 Dominant	383	1.01	385	0.0	0.0	N	0.972	19.7	1.48	0.293
W	R2	1 Dominant	383	1.01	385	0.0	0.0	N	0.972	19.7	1.48	0.293
West: Greenbag Road												
N	L2	1 Subdominant	176	1.00	176	0.0	0.0	N	0.985	17.4	2.00	0.192
E	T1	2 Dominant	176	1.00	176	0.0	0.0	N	0.985	17.4	2.00	0.192
S	R2	2 Dominant	176	1.00	176	0.0	0.0	N	0.985	17.4	2.00	0.192

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.43	0.337	N	1.00	4.87	141.7	3.17
N	T1	1	Dominant	1.43	0.337	N	1.00	4.87	141.7	3.17
E	R2	1	Dominant	1.43	0.337	N	1.00	4.87	141.7	3.17
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.227	N	1.00	6.75	166.5	4.46
W	T1	2	Dominant	2.00	0.227	Y	1.01	4.32	106.5	2.86
N	R2	2	Dominant	2.00	0.227	Y	1.00	4.28	105.5	2.83
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.48	0.293	Y	1.00	4.67	134.9	3.21
S	T1	1	Dominant	1.48	0.293	Y	1.00	4.67	134.9	3.21
W	R2	1	Dominant	1.48	0.293	N	1.03	4.81	139.0	3.30
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.192	N	1.03	7.06	180.5	4.63
E	T1	2	Dominant	2.00	0.192	Y	1.01	4.38	112.0	2.87
S	R2	2	Dominant	2.00	0.192	Y	1.02	4.42	113.1	2.90

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	92	95	19.9%
2	377	380	80.1%
Total	469	475	
East: Greenbag Road			
1	0	0	0.0%
2	209	212	100.0%
Total	209	212	
North: Dorsey Avenue			
1	63	63	16.4%
2	319	322	83.6%
Total	382	385	
West: Greenbag Road			
1	0	0	0.0%
2	176	176	100.0%
Total	176	176	

The SIDRA Standard roundabout capacity model option is in use.

This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	43	117	160
Total	43	117	160
East: Greenbag Road			
1	0	63	63
2	24	261	285
Total	24	324	348
North: Dorsey Avenue			
1	86	112	198
Total	86	112	198
West: Greenbag Road			
1	0	92	92
2	80	328	408
Total	80	420	500

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	35.0	34.8	3339.8#	65.4#	37.4	37.4	1.1
	North	T1	35.1	34.9	3339.8#	65.3#	36.8	36.8	1.1
	East	R2	34.2	33.9	3339.8#	67.1#	27.1	27.1	0.8
East: Greenbag Road									
	South	L2	33.9	33.8	3400.3#	68.6#	40.7	40.7	1.2
	West	T1	36.2	36.2	3331.4#	62.8#	164.2	164.2	4.5
	North	R2	35.1	35.1	3331.4#	64.8#	15.5	15.5	0.4
North: Dorsey Avenue									
	East	L2	35.5	35.4	3319.5#	63.9#	30.2	30.2	0.9
	South	T1	35.6	35.5	3319.5#	63.8#	40.4	40.4	1.1
	West	R2	34.6	34.5	3319.5#	65.7#	53.9	53.9	1.6
West: Greenbag Road									
	North	L2	33.9	33.8	3400.3#	68.5#	59.1	59.1	1.7
	East	T1	36.2	36.2	3322.9#	62.7#	206.8	206.8	5.7
	South	R2	35.0	35.0	3322.9#	64.7#	50.1	50.1	1.4
ALL VEHICLES:			35.4	35.3	3336.5#	64.4#	762.2	762.2	21.6

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA

```
West: Greenbag Road
           North    L2      51.0   14.8  200.3   1600     488     NA
            East    T1     144.0   22.0  138.3   1600     488     NA
           South    R2      83.8   17.9   58.6   1600     488     NA
------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-------------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn    Negn Cruise    Speed    Delay
 ID   Turn   mph    mph     mph   mph       mph      sec
-------------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     19.8      9.5
    8  T1     40.0   22.0   22.0  40.0     19.8      4.7
   18  R2     40.0   19.0   19.0  40.0     19.8      4.3
-------------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     23.6      9.5
    6  T1     40.0   22.0   22.0  40.0     29.0      4.7
   16  R2     40.0   17.9   17.9  40.0     29.0      4.6
-------------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     21.3      9.5
    4  T1     40.0   22.0   22.0  40.0     21.3      4.7
   14  R2     40.0   19.0   19.0  40.0     21.3      4.3
-------------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     23.9      9.5
    2  T1     40.0   22.0   22.0  40.0     31.3      4.7
   12  R2     40.0   17.9   17.9  40.0     31.3      4.6
-------------------------------------------------------------
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      59    468    474     266   0.85    282  0.222
    8  T1  #      58    468    474     262   0.85    282  0.222
   18  R2  #      43    468    474     193   0.85    282  0.222
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #      63    209    212     612   0.85    723  0.103
    6  T1  #     260    209    212     955   0.85    212  0.272
   16  R2  #      24    209    212      90   0.85    212  0.272
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #      48    383    385     189   0.85    234  0.254
    4  T1  #      64    383    385     253   0.85    234  0.254
   14  R2  #      86    383    385     337   0.85    234  0.254
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #      92    176    176     612   0.85    467  0.150
    2  T1  #     329    176    176     860   0.85    123  0.382*
   12  R2  #      80    176    176     208   0.85    123  0.382*
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
         (veh-h/h) (pers-h/h) (sec)  Rate               (veh-mi/h) (veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.20     0.24    12.3   0.74    43.9  1.77     37.4     1.1     34.8
    8  T1   0.12     0.14     7.4   0.74    43.2  1.67     36.8     1.1     34.9
   18  R2   0.08     0.10     7.0   0.74    31.8  1.33     27.1     0.8     33.9
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.20     0.24    11.5   0.69    43.9  1.62     40.7     1.2     33.8
    6  T1   0.42     0.50     5.7   0.53   137.6  6.33    164.2     4.5     36.2
   16  R2   0.04     0.05     5.6   0.53    12.9  1.02     15.5     0.4     35.1
-------------------------------------------------------------------------------------
```

North: Dorsey Avenue										
7	L2	0.15	0.19	11.6	0.69	33.0	1.52	30.2	0.9	35.4
4	T1	0.12	0.15	6.8	0.69	44.3	1.81	40.4	1.1	35.5
14	R2	0.15	0.19	6.5	0.69	59.0	2.69	53.9	1.6	34.5
West: Greenbag Road										
5	L2	0.29	0.35	11.4	0.69	63.3	2.60	59.1	1.7	33.8
2	T1	0.52	0.62	5.7	0.53	173.6	8.30	206.8	5.7	36.2
12	R2	0.12	0.15	5.6	0.53	42.1	3.25	50.1	1.4	35.0

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	14.90	0.9	8.4	0.01	0.001	0.003
8	T1	14.65	0.9	8.2	0.01	0.001	0.003
18	R2	10.97	1.1	9.4	0.01	0.001	0.003
		40.53	2.9	26.0	0.03	0.003	0.009
East: Greenbag Road							
1	L2	19.96	2.6	22.9	0.03	0.002	0.011
6	T1	55.40	3.1	27.6	0.03	0.003	0.012
16	R2	5.21	0.3	2.6	0.00	0.000	0.001
		80.58	6.0	53.2	0.06	0.005	0.024
North: Dorsey Avenue							
7	L2	15.23	1.9	16.7	0.02	0.002	0.015
4	T1	20.71	3.1	27.9	0.04	0.003	0.024
14	R2	26.86	2.6	23.3	0.03	0.002	0.024
		62.80	7.6	67.9	0.08	0.007	0.062
West: Greenbag Road							
5	L2	30.49	2.6	22.8	0.02	0.002	0.036
2	T1	100.42	12.9	115.1	0.14	0.011	0.139
12	R2	24.76	4.0	36.1	0.04	0.004	0.053
		155.68	19.5	174.0	0.21	0.017	0.229
INTERSECTION:		339.59	36.0	321.1	0.39	0.032	0.324

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.25	39.7	139.1	0.16	0.014	0.043
8	T1	0.25	39.7	139.1	0.16	0.014	0.043
18	R2	0.25	25.6	215.6	0.29	0.020	0.078
		0.25	34.6	159.6	0.19	0.016	0.052
East: Greenbag Road							
1	L2	0.30	15.8	349.9	0.44	0.037	0.174
6	T1	0.21	52.9	104.6	0.12	0.010	0.045
16	R2	0.21	53.0	104.3	0.12	0.010	0.041
		0.23	36.9	149.9	0.18	0.015	0.068
North: Dorsey Avenue							
7	L2	0.31	16.1	344.5	0.44	0.035	0.302
4	T1	0.32	12.9	428.9	0.54	0.045	0.362
14	R2	0.31	20.7	268.2	0.31	0.029	0.277
		0.31	16.3	338.9	0.42	0.036	0.310
West: Greenbag Road							
5	L2	0.32	23.2	239.4	0.26	0.024	0.380
2	T1	0.30	16.0	345.9	0.43	0.034	0.419
12	R2	0.31	12.4	447.9	0.54	0.044	0.661
		0.31	16.2	342.1	0.41	0.034	0.450
INTERSECTION:		0.28	21.2	261.7	0.32	0.026	0.264

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	160	721	0.222	9.1	0.74	1.0	24.2	1600.0
East: Greenbag Road								
1	63	612	0.103	11.5	0.69	0.4	9.8	1600.0
2	285	1045	0.272	5.7	0.53	1.3	32.6	1600.0
North: Dorsey Avenue								
1	198	778	0.254	7.8	0.69	1.1	27.1	1600.0
West: Greenbag Road								
1	92	612	0.150	11.4	0.69	0.6	15.1	1600.0
2	408	1069	0.382	5.7	0.53	2.0	51.6	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	160	150	721	0.222	100
East: Greenbag Road					
1	63	63	612	0.103	100
2	285	150	1045	0.272	100
North: Dorsey Avenue					
1	198	150	778	0.254	100
West: Greenbag Road					
1	92	92	612	0.150	100
2	408	150	1069	0.382	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	160	0		0.222	9.1	24	1600
	160	0		0.222	9.1	24	
East: Greenbag Road							
1	63	0		0.103	11.5	10	1600
2	285	1		0.272	5.7	33	1600
	348	1		0.272	6.8	33	
North: Dorsey Avenue							
1	198	1		0.254	7.8	27	1600
	198	1		0.254	7.8	27	
West: Greenbag Road							
1	92	3		0.150	11.4	15	1600
2	408	1		0.382	5.7	52	1600
	500	2		0.382	6.7	52	
ALL VEHICLES							
	Total Flow	% HV		Max X	Aver. Delay	Max Queue	
	1206	1		0.382	7.2	52	

```
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout
```

Lane No.	Satn Speed mph	Satn Flow veh/h	Satn Hdwy sec	Satn Spacing ft	Average Queue Space ft	Driver Response Time sec
South: Kingwood Pike						
1	18.5	1134	3.17	86.33	25.00	2.25
East: Greenbag Road						
1	14.8	807	4.46	97.01	25.00	3.31
2	21.6	1262	2.85	90.48	25.18	2.06
North: Dorsey Avenue						
1	18.9	1108	3.25	90.25	25.26	2.34
West: Greenbag Road						
1	14.8	778	4.63	100.54	25.60	3.45
2	21.2	1252	2.88	89.30	25.24	2.06

Saturation Flow and Saturation Headway are derived from follow-up headway.

Go to Table Links (Top)

Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout
```

LANE DELAYS

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Delay (seconds/veh) Min Del dm	Stop-line Delay 1st d1	2nd d2	Total dSL	Acc. Dec. dn	Queuing Total dq	MvUp dqm	Stopd (Idle) di	Geom dig	Control dic
South: Kingwood Pike													
1	0.222	NA	NA	2.0	2.7	0.0	2.7	2.5	0.4	0.0	0.4	6.4	9.1
East: Greenbag Road													
1	0.103	NA	NA	1.5	2.0	0.0	2.0	1.8	0.2	0.0	0.2	9.5	11.5
2	0.272	NA	NA	0.7	1.0	0.0	1.0	2.3	0.0	0.0	0.0	4.7	5.7
North: Dorsey Avenue													
1	0.254	NA	NA	1.5	2.1	0.0	2.1	2.3	0.1	0.0	0.1	5.7	7.8
West: Greenbag Road													
1	0.150	NA	NA	1.4	1.8	0.0	1.8	1.7	0.1	0.0	0.1	9.5	11.4
2	0.382	NA	NA	0.5	1.0	0.0	1.0	2.3	0.0	0.0	0.0	4.7	5.7

```
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout
```

BACK OF QUEUE (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	Queue Stor. Ratio 95%	Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.222	NA	NA	0.0	0.4	0.0	0.4	1.0	0.01	0.02	0.0	NA

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road												
1	0.103	NA	NA	0.0	0.2	0.0	0.2	0.4	0.00	0.01	0.0	NA
2	0.272	NA	NA	0.0	0.5	0.0	0.5	1.3	0.01	0.02	0.0	NA
North: Dorsey Avenue												
1	0.254	NA	NA	0.0	0.4	0.0	0.4	1.1	0.01	0.02	0.0	NA
West: Greenbag Road												
1	0.150	NA	NA	0.0	0.2	0.0	0.2	0.6	0.00	0.01	0.0	NA
2	0.382	NA	NA	0.0	0.8	0.0	0.8	2.0	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.222	NA	NA	0.0	9.7	0.0	9.7	24.2	0.01	0.02	0.0	NA
East: Greenbag Road												
1	0.103	NA	NA	0.0	3.9	0.0	3.9	9.8	0.00	0.01	0.0	NA
2	0.272	NA	NA	0.0	13.1	0.0	13.1	32.6	0.01	0.02	0.0	NA
North: Dorsey Avenue												
1	0.254	NA	NA	0.0	10.9	0.0	10.9	27.1	0.01	0.02	0.0	NA
West: Greenbag Road												
1	0.150	NA	NA	0.0	6.1	0.0	6.1	15.1	0.00	0.01	0.0	NA
2	0.382	NA	NA	0.0	20.8	0.0	20.8	51.6	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.222	NA	NA	0.0	0.1	0.2
East: Greenbag Road						
1	0.103	NA	NA	0.0	0.0	0.1
2	0.272	NA	NA	0.0	0.1	0.1
North: Dorsey Avenue						
1	0.254	NA	NA	0.0	0.1	0.2
West: Greenbag Road						
1	0.150	NA	NA	0.0	0.0	0.1
2	0.382	NA	NA	0.0	0.1	0.2

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.222	NA	NA	0.0	3.1	5.5
East: Greenbag Road						
1	0.103	NA	NA	0.0	0.9	1.6
2	0.272	NA	NA	0.0	2.1	3.8
North: Dorsey Avenue						
1	0.254	NA	NA	0.0	3.0	5.4
West: Greenbag Road						
1	0.150	NA	NA	0.0	1.2	2.2
2	0.382	NA	NA	0.0	2.9	5.2

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane	Deg. Satn	Percentile Back of Queue (veh)

Lane No.	x	50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.222	0.4	0.5	0.7	0.8	1.0	1.1	1.2
East: Greenbag Road								
1	0.103	0.2	0.2	0.3	0.3	0.4	0.4	0.5
2	0.272	0.5	0.7	1.0	1.1	1.3	1.4	1.5
North: Dorsey Avenue								
1	0.254	0.4	0.6	0.8	0.9	1.1	1.2	1.3
West: Greenbag Road								
1	0.150	0.2	0.3	0.4	0.5	0.6	0.7	0.7
2	0.382	0.8	1.1	1.5	1.7	2.0	2.3	2.4

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.222	9.7	12.6	17.7	20.5	24.2	26.8	28.8
East: Greenbag Road								
1	0.103	3.9	5.1	7.2	8.3	9.8	10.9	11.7
2	0.272	13.1	17.0	23.9	27.7	32.6	36.2	38.9
North: Dorsey Avenue								
1	0.254	10.9	14.1	19.9	23.1	27.1	30.1	32.4
West: Greenbag Road								
1	0.150	6.1	7.9	11.1	12.9	15.1	16.8	18.0
2	0.382	20.7	26.9	37.9	43.9	51.6	57.2	61.5

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.222	NA	NA	0.48	0.00	0.26	0.74	119.0	0.00	0.0	0.54	0.54
East: Greenbag Road												
1	0.103	NA	NA	0.28	0.00	0.41	0.69	43.9	0.00	0.0	0.38	0.38
2	0.272	NA	NA	0.26	0.00	0.27	0.53	150.5	0.00	0.0	0.37	0.37
North: Dorsey Avenue												
1	0.254	NA	NA	0.41	0.00	0.27	0.69	136.3	0.00	0.0	0.48	0.48
West: Greenbag Road												
1	0.150	NA	NA	0.27	0.00	0.42	0.69	63.3	0.00	0.0	0.37	0.37
2	0.382	NA	NA	0.26	0.00	0.27	0.53	215.7	0.00	0.0	0.38	0.38

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

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Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	59.2	58.2	42.9	160.2
%HV (all designations)	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT

Flow Rate	63.3	260.2	24.5	348.0
%HV (all designations)	0.0	1.0	0.0	0.7

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	48.0	64.3	85.7	198.0
%HV (all designations)	0.0	0.0	3.0	1.3

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	91.8	328.6	79.6	500.0
%HV (all designations)	3.0	1.0	2.0	1.5

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

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Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	59.2	58.2	42.9	160.2
Mov Class %	100.0	100.0	100.0	100.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	63.3	257.6	24.5	345.4
Mov Class %	100.0	99.0	100.0	99.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	48.0	64.3	83.1	195.4
Mov Class %	100.0	100.0	97.0	98.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	89.1	325.3	78.0	492.4
Mov Class %	97.0	99.0	98.0	98.5
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	0.0	0.0
Mov Class %	0.0	0.0	0.0	0.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	2.6	0.0	2.6
Mov Class %	0.0	1.0	0.0	0.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	2.6	2.6
Mov Class %	0.0	0.0	3.0	1.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT

```
-----------------------------------------------------
 Flow Rate             2.8     3.3     1.6     7.6
 Mov Class %           3.0     1.0     2.0     1.5
 Flow Scale           1.00    1.00    1.00       -
 Peak Flow Factor     0.98    0.98    0.98       -
 Residual Demand       0.0     0.0     0.0     0.0
-----------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-----------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:               L2      T1      R2     TOT
-----------------------------------------------------
 Lane  1
   LV              59.2    58.2    42.9   160.2
   Total           59.2    58.2    42.9   160.2
-----------------------------------------------------
 Approach          59.2    58.2    42.9   160.2
-----------------------------------------------------
 From EAST To:        S       W       N
 Turn:               L2      T1      R2     TOT
-----------------------------------------------------
 Lane  1
   LV              63.3       *       *    63.3
   Total           63.3       *       *    63.3
 Lane  2
   LV                 *   257.6    24.5   282.1
   HV                 *     2.6       *     2.6
   Total              *   260.2    24.5   284.7
-----------------------------------------------------
 Approach          63.3   260.2    24.5   348.0
-----------------------------------------------------
 From NORTH To:       E       S       W
 Turn:               L2      T1      R2     TOT
-----------------------------------------------------
 Lane  1
   LV              48.0    64.3    83.1   195.4
   HV                 *       *     2.6     2.6
   Total           48.0    64.3    85.7   198.0
-----------------------------------------------------
 Approach          48.0    64.3    85.7   198.0
-----------------------------------------------------
 From WEST To:        N       E       S
 Turn:               L2      T1      R2     TOT
-----------------------------------------------------
 Lane  1
   LV              89.1       *       *    89.1
   HV               2.8       *       *     2.8
   Total           91.8       *       *    91.8
 Lane  2
   LV                 *   325.3    78.0   403.3
   HV                 *     3.3     1.6     4.9
   Total              *   328.6    79.6   408.2
-----------------------------------------------------
 Approach          91.8   328.6    79.6   500.0
-----------------------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           205.6     1.6   207.1
Total              205.6     1.6   207.1
-----------------------------------------
 Exit: EAST
Lane:  1           416.1     3.3   419.4
Total              416.1     3.3   419.4
-----------------------------------------
 Exit: NORTH
Lane:  1           171.7     2.8   174.5
Total              171.7     2.8   174.5
-----------------------------------------
 Exit: WEST
Lane:  1           399.9     5.2   405.1
Total              399.9     5.2   405.1
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS
```

```
-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           205.6     1.6   207.1
Total              205.6     1.6   207.1
-----------------------------------------
 Exit: EAST
Lane:  1           416.1     3.3   419.4
Total              416.1     3.3   419.4
-----------------------------------------
 Exit: NORTH
Lane:  1           171.7     2.8   174.5
Total              171.7     2.8   174.5
-----------------------------------------
 Exit: WEST
Lane:  1           399.9     5.2   405.1
Total              399.9     5.2   405.1
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

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Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


Lane Flow-Capacity Iterations:

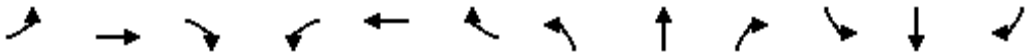
  Site Model Variability Index (Iterations 3 to N):   1.1%
  Number of Iterations: 5 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     1.7%   1.0%   0.5%

Other Diagnostic Messages (if any):
```

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SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:16:12 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2A - Greenbag & Dorsey-Kingwood With Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

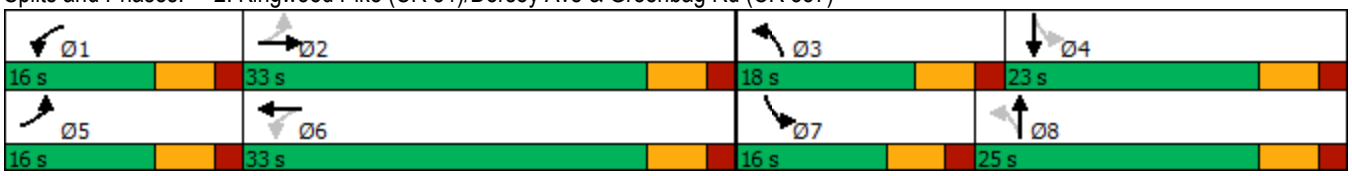
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.930			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1628	0	1678	1728	0	1788	1750	0	1684	1411	0
Flt Permitted	0.160			0.350			0.421			0.258		
Satd. Flow (perm)	264	1628	0	618	1728	0	792	1750	0	457	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			45			168	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	538	0	208	410	0	92	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		16.0	16.0		16.0	16.0	
Total Split (s)	16.0	33.0		16.0	33.0		18.0	25.0		16.0	23.0	
Total Split (%)	17.8%	36.7%		17.8%	36.7%		20.0%	27.8%		17.8%	25.6%	
Maximum Green (s)	10.0	27.0		10.0	27.0		12.0	19.0		10.0	17.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	36.2	31.3		32.8	27.7		28.2	19.5		22.3	13.9	
Actuated g/C Ratio	0.44	0.38		0.40	0.34		0.35	0.24		0.27	0.17	
v/c Ratio	0.31	0.70		0.10	0.91		0.51	0.91		0.37	0.52	
Control Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
LOS	B	C		B	D		C	E		C	B	
Approach Delay		29.5			49.9			45.2			16.2	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)	22	215		10	291		77	202		32	13	
Queue Length 95th (ft)	47	#387		26	#531		134	#408		66	74	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	282	627		399	588		426	452		289	433	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.70		0.09	0.91		0.49	0.91		0.32	0.45	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 81.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 38.3		Intersection LOS: D	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

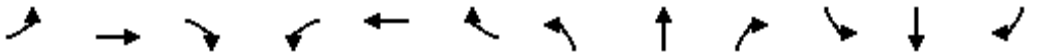
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



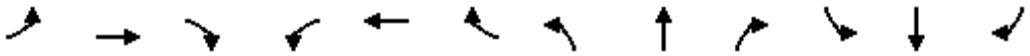
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1706	1706	1843	1828	1798	1919	1947	1947	1966	1834	1676	1834
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	208	531	50	260	562	23	389	237	209	222	40	241
Arrive On Green	0.05	0.35	0.35	0.03	0.33	0.33	0.11	0.25	0.25	0.06	0.19	0.19
Sat Flow, veh/h	1625	1534	146	1741	1716	70	1854	956	842	1746	208	1247
Grp Volume(v), veh/h	75	0	438	34	0	538	208	0	410	92	0	196
Grp Sat Flow(s),veh/h/ln	1625	0	1680	1741	0	1786	1854	0	1798	1746	0	1455
Q Serve(g_s), s	2.3	0.0	17.7	1.0	0.0	22.2	6.7	0.0	17.0	3.2	0.0	9.6
Cycle Q Clear(g_c), s	2.3	0.0	17.7	1.0	0.0	22.2	6.7	0.0	17.0	3.2	0.0	9.6
Prop In Lane	1.00		0.09	1.00		0.04	1.00		0.47	1.00		0.86
Lane Grp Cap(c), veh/h	208	0	581	260	0	585	389	0	446	222	0	281
V/C Ratio(X)	0.36	0.00	0.75	0.13	0.00	0.92	0.54	0.00	0.92	0.41	0.00	0.70
Avail Cap(c_a), veh/h	336	0	592	429	0	629	468	0	446	347	0	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	22.2	17.7	0.0	24.8	21.3	0.0	28.1	23.8	0.0	28.8
Incr Delay (d2), s/veh	1.0	0.0	5.3	0.2	0.0	18.1	1.1	0.0	24.1	1.2	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	9.0	0.5	0.0	13.8	3.5	0.0	11.4	1.6	0.0	4.3
LnGrp Delay(d),s/veh	20.1	0.0	27.5	18.0	0.0	42.9	22.4	0.0	52.1	25.1	0.0	34.3
LnGrp LOS	C		C	B		D	C		D	C		C
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		26.4			41.4			42.2			31.4	
Approach LOS		C			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	32.5	14.7	20.8	10.0	31.1	10.5	25.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	27.0	12.0	17.0	10.0	27.0	10.0	19.0
Max Q Clear Time (g_c+I1), s	3.0	19.7	8.7	11.6	4.3	24.2	5.2	19.0
Green Ext Time (p_c), s	0.0	1.5	0.2	0.5	0.1	0.9	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	36.3
HCM 2010 LOS	D



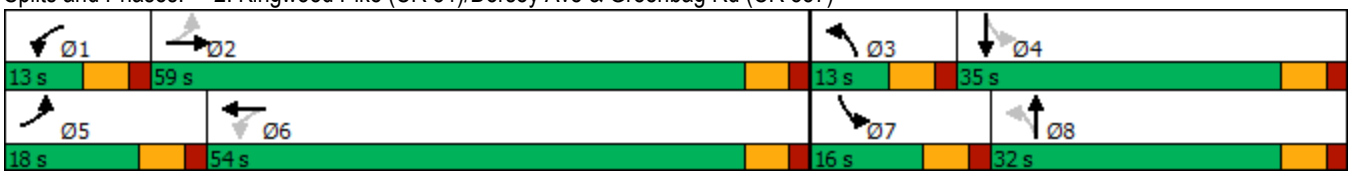
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.990			0.931			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1709	0	1762	1820	0	1736	1726	0	1667	1651	0
Flt Permitted	0.258			0.091			0.198			0.480		
Satd. Flow (perm)	460	1709	0	169	1820	0	362	1726	0	842	1651	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			33			27	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	505	0	79	163	0	149	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	18.0	59.0		13.0	54.0		13.0	32.0		16.0	35.0	
Total Split (%)	15.0%	49.2%		10.8%	45.0%		10.8%	26.7%		13.3%	29.2%	
Maximum Green (s)	12.0	53.0		7.0	48.0		7.0	26.0		10.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	62.4	51.9		55.6	48.6		29.3	22.5		36.0	28.3	
Actuated g/C Ratio	0.54	0.45		0.48	0.42		0.25	0.19		0.31	0.25	
v/c Ratio	0.46	0.97		0.74	0.66		0.46	0.45		0.45	0.94	
Control Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
LOS	B	E		D	C		D	D		C	E	
Approach Delay		49.6			35.4			36.3			62.1	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	61	554		47	314		41	86		82	289	
Queue Length 95th (ft)	97	#811		#143	438		77	151		134	#479	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	384	799		178	774		176	417		334	438	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.94		0.74	0.65		0.45	0.39		0.45	0.91	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 115.4			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 47.3		Intersection LOS: D	
Intersection Capacity Utilization 87.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

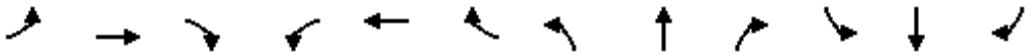


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1829	1843	1919	1901	1919	1891	1918	1966	1815	1819	1834
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	4	3	3	1	0	0
Cap, veh/h	377	606	172	185	751	54	164	204	174	363	251	171
Arrive On Green	0.07	0.44	0.44	0.06	0.43	0.43	0.05	0.21	0.21	0.08	0.25	0.25
Sat Flow, veh/h	1755	1370	390	1828	1752	127	1801	958	816	1729	1010	687
Grp Volume(v), veh/h	164	0	750	131	0	505	79	0	163	149	0	400
Grp Sat Flow(s),veh/h/ln	1755	0	1760	1828	0	1879	1801	0	1774	1729	0	1697
Q Serve(g_s), s	6.0	0.0	48.3	4.6	0.0	24.5	4.0	0.0	9.3	7.7	0.0	27.0
Cycle Q Clear(g_c), s	6.0	0.0	48.3	4.6	0.0	24.5	4.0	0.0	9.3	7.7	0.0	27.0
Prop In Lane	1.00		0.22	1.00		0.07	1.00		0.46	1.00		0.41
Lane Grp Cap(c), veh/h	377	0	778	185	0	806	164	0	378	363	0	422
V/C Ratio(X)	0.44	0.00	0.96	0.71	0.00	0.63	0.48	0.00	0.43	0.41	0.00	0.95
Avail Cap(c_a), veh/h	435	0	800	192	0	806	187	0	395	368	0	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.3	0.0	31.6	27.1	0.0	26.0	35.8	0.0	39.8	32.0	0.0	43.1
Incr Delay (d2), s/veh	0.8	0.0	23.0	11.0	0.0	1.5	2.2	0.0	0.8	0.7	0.0	30.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	28.3	2.9	0.0	13.0	2.1	0.0	4.7	3.7	0.0	16.3
LnGrp Delay(d),s/veh	20.1	0.0	54.6	38.1	0.0	27.6	38.0	0.0	40.6	32.7	0.0	73.9
LnGrp LOS	C		D	D		C	D		D	C		E
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		48.4			29.7			39.7			62.7	
Approach LOS		D			C			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	57.6	11.5	35.0	14.1	56.0	15.7	30.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	53.0	7.0	29.0	12.0	48.0	10.0	26.0
Max Q Clear Time (g_c+I1), s	6.6	50.3	6.0	29.0	8.0	26.5	9.7	11.3
Green Ext Time (p_c), s	0.0	1.3	0.0	0.0	0.1	3.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	45.8
HCM 2010 LOS	D

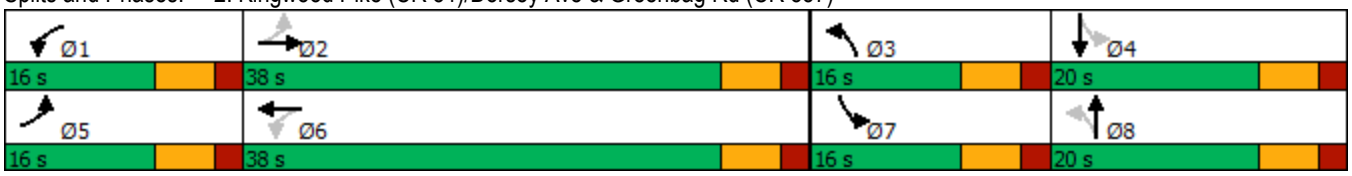
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (vph)	90	322	78	62	255	24	58	57	42	47	63	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.987			0.936			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1643	1709	0	1762	1814	0	1806	1779	0	1684	1593	0
Flt Permitted	0.497			0.466			0.653			0.692		
Satd. Flow (perm)	860	1709	0	864	1814	0	1241	1779	0	1226	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			6			35			64	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	92	329	80	63	260	24	59	58	43	48	64	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	409	0	63	284	0	59	101	0	48	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	16.0	38.0		16.0	38.0		16.0	20.0		16.0	20.0	
Total Split (%)	17.8%	42.2%		17.8%	42.2%		17.8%	22.2%		17.8%	22.2%	
Maximum Green (s)	10.0	32.0		10.0	32.0		10.0	14.0		10.0	14.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	33.4	31.7		30.3	27.5		13.8	9.9		13.6	9.8	
Actuated g/C Ratio	0.54	0.51		0.49	0.45		0.22	0.16		0.22	0.16	
v/c Ratio	0.16	0.46		0.12	0.35		0.17	0.32		0.15	0.49	
Control Delay	10.3	20.2		10.3	20.5		19.9	23.8		19.8	24.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.3	20.2		10.3	20.5		19.9	23.8		19.8	24.9	
LOS	B	C		B	C		B	C		B	C	
Approach Delay		18.4			18.7			22.3			23.6	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	19	147		13	96		17	25		14	33	
Queue Length 95th (ft)	48	282		35	190		50	77		43	102	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	624	1019		627	1078		456	501		430	471	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.40		0.10	0.26		0.13	0.20		0.11	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 61.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Future Volume (veh/h)	90	322	78	62	255	24	58	57	42	47	63	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1789	1821	1843	1919	1902	1919	1966	1966	1966	1834	1802	1834
Adj Flow Rate, veh/h	92	329	80	63	260	24	59	58	43	48	64	86
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	1	1	0	1	1	0	0	0	0	0	0
Cap, veh/h	419	418	102	325	483	45	299	146	108	334	92	124
Arrive On Green	0.07	0.29	0.29	0.06	0.28	0.28	0.06	0.14	0.14	0.05	0.13	0.13
Sat Flow, veh/h	1704	1416	344	1828	1715	158	1873	1050	779	1746	698	938
Grp Volume(v), veh/h	92	0	409	63	0	284	59	0	101	48	0	150
Grp Sat Flow(s),veh/h/ln	1704	0	1760	1828	0	1874	1873	0	1829	1746	0	1637
Q Serve(g_s), s	1.9	0.0	11.1	1.2	0.0	6.7	1.4	0.0	2.6	1.2	0.0	4.6
Cycle Q Clear(g_c), s	1.9	0.0	11.1	1.2	0.0	6.7	1.4	0.0	2.6	1.2	0.0	4.6
Prop In Lane	1.00		0.20	1.00		0.08	1.00		0.43	1.00		0.57
Lane Grp Cap(c), veh/h	419	0	519	325	0	528	299	0	254	334	0	216
V/C Ratio(X)	0.22	0.00	0.79	0.19	0.00	0.54	0.20	0.00	0.40	0.14	0.00	0.70
Avail Cap(c_a), veh/h	626	0	1081	571	0	1151	555	0	492	586	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	16.9	12.9	0.0	15.8	18.0	0.0	20.4	18.1	0.0	21.6
Incr Delay (d2), s/veh	0.3	0.0	2.7	0.3	0.0	0.9	0.3	0.0	1.0	0.2	0.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.7	0.6	0.0	3.6	0.7	0.0	1.4	0.6	0.0	2.3
LnGrp Delay(d),s/veh	12.3	0.0	19.6	13.2	0.0	16.7	18.3	0.0	21.5	18.3	0.0	25.6
LnGrp LOS	B		B	B		B	B		C	B		C
Approach Vol, veh/h		501			347			160			198	
Approach Delay, s/veh		18.2			16.1			20.3			23.8	
Approach LOS		B			B			C			C	

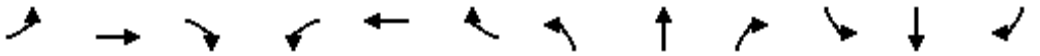
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	21.4	8.9	12.9	9.7	20.7	8.5	13.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	32.0	10.0	14.0	10.0	32.0	10.0	14.0
Max Q Clear Time (g_c+I1), s	3.2	13.1	3.4	6.6	3.9	8.7	3.2	4.6
Green Ext Time (p_c), s	0.1	2.2	0.0	0.4	0.1	1.5	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

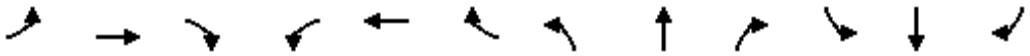
Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & DORSEY AVENUE/KINGWOOD PIKE

With Luckey Lane Connection to Greenbag Road Terminated



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	134	191	201	177	141	26	155
Future Volume (vph)	69	368	35	31	476	134	191	201	177	141	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.967			0.958			0.935	
Flt Protected	0.950			0.950				0.983			0.979	
Satd. Flow (prot)	1567	1628	0	1678	1701	0	0	1711	0	0	1488	0
Flt Permitted	0.118			0.365				0.744			0.565	
Satd. Flow (perm)	195	1628	0	645	1701	0	0	1295	0	0	859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			17			28			58	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	146	208	218	192	153	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	663	0	0	618	0	0	349	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



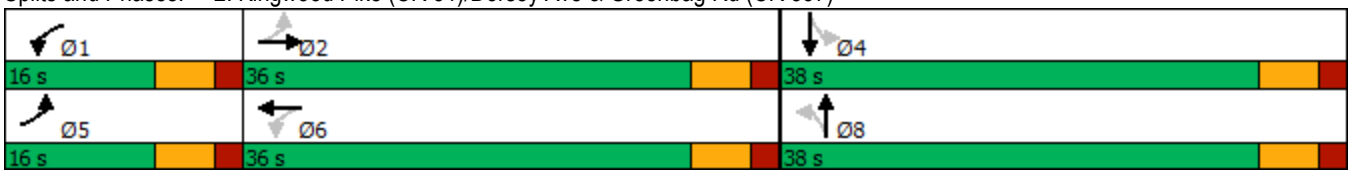
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	16.0	36.0		16.0	36.0		38.0	38.0		38.0	38.0	
Total Split (%)	17.8%	40.0%		17.8%	40.0%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	10.0	30.0		10.0	30.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	39.0	33.9		35.3	30.2			32.2			32.2	
Actuated g/C Ratio	0.46	0.40		0.41	0.35			0.38			0.38	
v/c Ratio	0.35	0.68		0.10	1.09			1.23			0.97	
Control Delay	16.4	29.0		12.2	91.7			145.8			67.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	16.4	29.0		12.2	91.7			145.8			67.7	
LOS	B	C		B	F			F			E	
Approach Delay		27.1			87.8			145.8			67.7	
Approach LOS		C			F			F			E	
Queue Length 50th (ft)	21	207		9	~422			~427			166	
Queue Length 95th (ft)	44	#331		24	#656			#654			#360	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	251	647		406	610			504			358	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.30	0.68		0.08	1.09			1.23			0.97	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 85.6			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 86.7		Intersection LOS: F	
Intersection Capacity Utilization 89.9%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

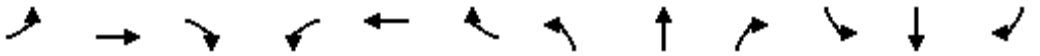
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



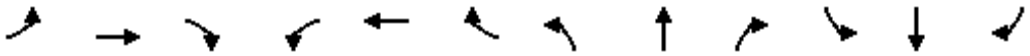
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	134	191	201	177	141	26	155
Future Volume (veh/h)	69	368	35	31	476	134	191	201	177	141	26	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1706	1706	1843	1828	1820	1919	1966	1947	1966	1834	1741	1834
Adj Flow Rate, veh/h	75	400	38	34	517	146	208	218	192	153	28	168
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	165	573	54	284	487	138	230	198	167	208	52	185
Arrive On Green	0.05	0.37	0.37	0.03	0.36	0.36	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1625	1534	146	1741	1366	386	455	522	440	386	137	486
Grp Volume(v), veh/h	75	0	438	34	0	663	618	0	0	349	0	0
Grp Sat Flow(s),veh/h/ln	1625	0	1680	1741	0	1752	1417	0	0	1009	0	0
Q Serve(g_s), s	2.4	0.0	18.6	1.0	0.0	30.0	4.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.4	0.0	18.6	1.0	0.0	30.0	32.0	0.0	0.0	27.2	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.22	0.34		0.31	0.44		0.48
Lane Grp Cap(c), veh/h	165	0	627	284	0	625	596	0	0	445	0	0
V/C Ratio(X)	0.45	0.00	0.70	0.12	0.00	1.06	1.04	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	279	0	627	434	0	625	596	0	0	445	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.9	0.0	22.4	17.8	0.0	27.1	27.7	0.0	0.0	23.9	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	3.4	0.2	0.0	53.4	46.7	0.0	0.0	8.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	9.2	0.5	0.0	23.7	21.5	0.0	0.0	8.7	0.0	0.0
LnGrp Delay(d),s/veh	22.9	0.0	25.8	18.0	0.0	80.5	74.4	0.0	0.0	32.7	0.0	0.0
LnGrp LOS	C		C	B		F	F			C		
Approach Vol, veh/h		513			697			618			349	
Approach Delay, s/veh		25.4			77.5			74.4			32.7	
Approach LOS		C			E			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	37.4		38.0	10.1	36.0		38.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	30.0		32.0	10.0	30.0		32.0
Max Q Clear Time (g_c+I1), s	3.0	20.6		29.2	4.4	32.0		34.0
Green Ext Time (p_c), s	0.0	1.7		0.6	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.1
HCM 2010 LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	192	70	78	67	203	212	144
Future Volume (vph)	146	520	148	117	419	192	70	78	67	203	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.953			0.958			0.965	
Flt Protected	0.950			0.950				0.984			0.982	
Satd. Flow (prot)	1692	1709	0	1762	1756	0	0	1680	0	0	1608	0
Flt Permitted	0.131			0.133				0.678			0.767	
Satd. Flow (perm)	233	1709	0	247	1756	0	0	1157	0	0	1256	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			28			28			22	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	216	79	88	75	228	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	687	0	0	242	0	0	628	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



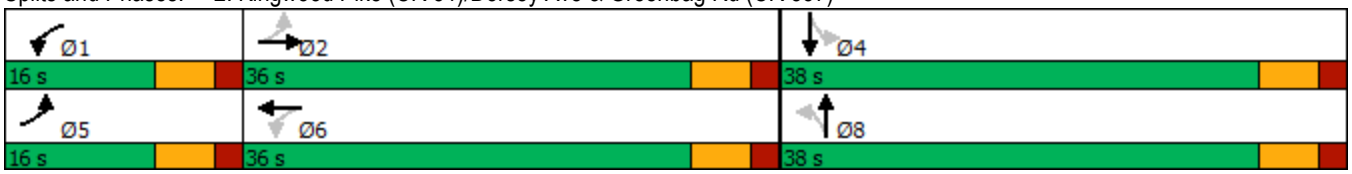
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	16.0	36.0		16.0	36.0		38.0	38.0		38.0	38.0	
Total Split (%)	17.8%	40.0%		17.8%	40.0%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	10.0	30.0		10.0	30.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	39.7	30.5		38.6	30.0			32.0			32.0	
Actuated g/C Ratio	0.45	0.34		0.43	0.34			0.36			0.36	
v/c Ratio	0.65	1.26		0.52	1.13			0.56			1.35	
Control Delay	28.1	157.4		20.7	106.0			26.3			199.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	28.1	157.4		20.7	106.0			26.3			199.1	
LOS	C	F		C	F			C			F	
Approach Delay		134.2			92.4			26.3			199.1	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)	48	~535		37	~451			96			~471	
Queue Length 95th (ft)	103	#756		72	#655			172			#670	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	269	596		280	609			433			464	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.61	1.26		0.47	1.13			0.56			1.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 89.2			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 126.7		Intersection LOS: F	
Intersection Capacity Utilization 100.6%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

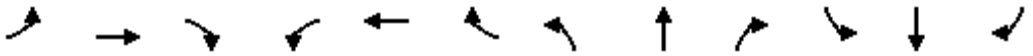
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



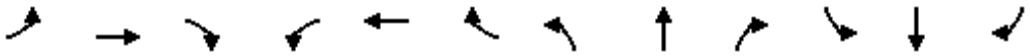
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	192	70	78	67	203	212	144
Future Volume (veh/h)	146	520	148	117	419	192	70	78	67	203	212	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1829	1843	1919	1906	1919	1966	1909	1966	1834	1818	1834
Adj Flow Rate, veh/h	164	584	166	131	471	216	79	88	75	228	238	162
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	3	3	3	0	0	0
Cap, veh/h	226	493	140	205	426	195	184	203	149	241	202	134
Arrive On Green	0.08	0.36	0.36	0.07	0.34	0.34	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1755	1370	390	1828	1238	568	351	552	406	504	549	366
Grp Volume(v), veh/h	164	0	750	131	0	687	242	0	0	628	0	0
Grp Sat Flow(s),veh/h/ln	1755	0	1760	1828	0	1806	1309	0	0	1419	0	0
Q Serve(g_s), s	5.2	0.0	31.3	4.0	0.0	30.0	0.0	0.0	0.0	21.0	0.0	0.0
Cycle Q Clear(g_c), s	5.2	0.0	31.3	4.0	0.0	30.0	11.0	0.0	0.0	32.0	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.31	0.33		0.31	0.36		0.26
Lane Grp Cap(c), veh/h	226	0	633	205	0	622	536	0	0	577	0	0
V/C Ratio(X)	0.73	0.00	1.19	0.64	0.00	1.10	0.45	0.00	0.00	1.09	0.00	0.00
Avail Cap(c_a), veh/h	284	0	633	292	0	622	536	0	0	577	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.0	0.0	27.9	21.4	0.0	28.6	20.5	0.0	0.0	29.4	0.0	0.0
Incr Delay (d2), s/veh	6.7	0.0	98.9	3.3	0.0	68.3	0.6	0.0	0.0	63.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	32.5	2.2	0.0	26.6	4.5	0.0	0.0	24.0	0.0	0.0
LnGrp Delay(d),s/veh	27.7	0.0	126.8	24.8	0.0	96.8	21.1	0.0	0.0	92.9	0.0	0.0
LnGrp LOS	C		F	C		F	C			F		
Approach Vol, veh/h		914			818			242			628	
Approach Delay, s/veh		109.0			85.3			21.1			92.9	
Approach LOS		F			F			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.8	37.3		38.0	13.1	36.0		38.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	30.0		32.0	10.0	30.0		32.0
Max Q Clear Time (g_c+I1), s	6.0	33.3		34.0	7.2	32.0		13.0
Green Ext Time (p_c), s	0.1	0.0		0.0	0.1	0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	89.5
HCM 2010 LOS	F



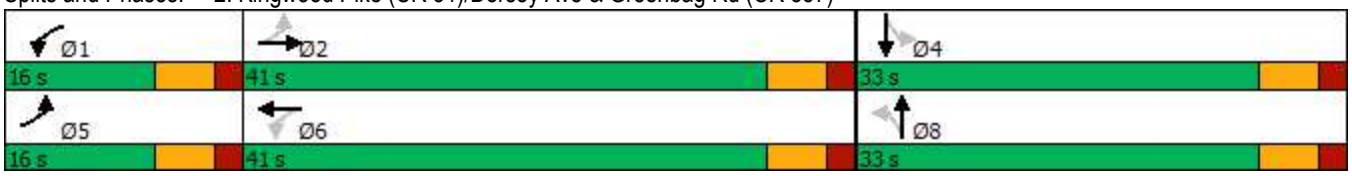
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	322	78	62	255	83	58	57	42	103	63	84
Future Volume (vph)	90	322	78	62	255	83	58	57	42	103	63	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	150		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.963			0.964			0.954	
Flt Protected	0.950			0.950				0.982			0.980	
Satd. Flow (prot)	1643	1709	0	1762	1773	0	0	1737	0	0	1584	0
Flt Permitted	0.409			0.446				0.802			0.821	
Satd. Flow (perm)	707	1709	0	827	1773	0	0	1419	0	0	1327	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			21			21			29	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	92	329	80	63	260	85	59	58	43	105	64	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	409	0	63	345	0	0	160	0	0	255	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	16.0	41.0		16.0	41.0		33.0	33.0		33.0	33.0	
Total Split (%)	17.8%	45.6%		17.8%	45.6%		36.7%	36.7%		36.7%	36.7%	
Maximum Green (s)	10.0	35.0		10.0	35.0		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	27.1	22.8		24.3	19.2			16.7			16.7	
Actuated g/C Ratio	0.45	0.38		0.40	0.32			0.28			0.28	
v/c Ratio	0.21	0.62		0.14	0.59			0.39			0.65	
Control Delay	9.5	21.7		9.3	22.6			21.3			28.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.5	21.7		9.3	22.6			21.3			28.3	
LOS	A	C		A	C			C			C	
Approach Delay		19.4			20.5			21.3			28.3	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	15	125		10	99			41			73	
Queue Length 95th (ft)	45	267		33	217			112			186	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	150			225								
Base Capacity (vph)	508	1083		545	1126			740			696	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.18	0.38		0.12	0.31			0.22			0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 60			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	322	78	62	255	83	58	57	42	103	63	84
Future Volume (veh/h)	90	322	78	62	255	83	58	57	42	103	63	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1789	1821	1843	1919	1905	1919	1966	1966	1966	1834	1815	1834
Adj Flow Rate, veh/h	92	329	80	63	260	85	59	58	43	105	64	86
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	1	1	0	1	1	0	0	0	0	0	0
Cap, veh/h	421	437	106	374	403	132	214	190	108	232	112	117
Arrive On Green	0.08	0.31	0.31	0.06	0.29	0.29	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1704	1416	344	1828	1376	450	462	855	484	526	504	524
Grp Volume(v), veh/h	92	0	409	63	0	345	160	0	0	255	0	0
Grp Sat Flow(s),veh/h/ln	1704	0	1760	1828	0	1825	1801	0	0	1553	0	0
Q Serve(g_s), s	1.6	0.0	9.2	1.0	0.0	7.3	0.0	0.0	0.0	3.3	0.0	0.0
Cycle Q Clear(g_c), s	1.6	0.0	9.2	1.0	0.0	7.3	3.2	0.0	0.0	6.5	0.0	0.0
Prop In Lane	1.00		0.20	1.00		0.25	0.37		0.27	0.41		0.34
Lane Grp Cap(c), veh/h	421	0	544	374	0	535	512	0	0	461	0	0
V/C Ratio(X)	0.22	0.00	0.75	0.17	0.00	0.64	0.31	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	676	0	1395	677	0	1447	1131	0	0	1029	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.9	0.0	13.7	10.4	0.0	13.6	14.6	0.0	0.0	15.7	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	2.1	0.2	0.0	1.3	0.3	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	4.8	0.5	0.0	3.8	1.7	0.0	0.0	3.0	0.0	0.0
LnGrp Delay(d),s/veh	10.2	0.0	15.9	10.6	0.0	14.9	14.9	0.0	0.0	16.8	0.0	0.0
LnGrp LOS	B		B	B		B	B			B		
Approach Vol, veh/h		501			408			160			255	
Approach Delay, s/veh		14.8			14.2			14.9			16.8	
Approach LOS		B			B			B			B	

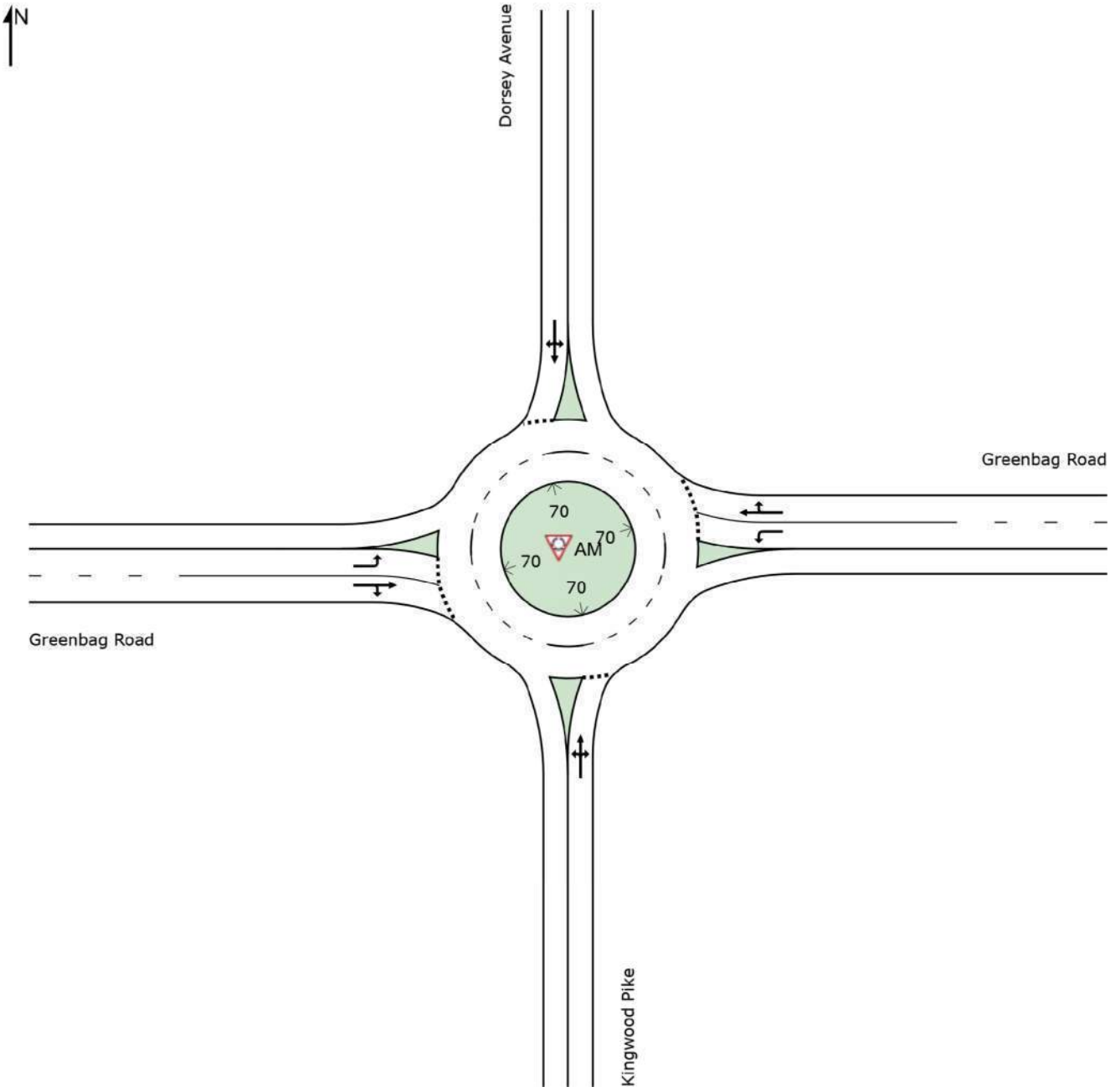
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	19.6		15.8	9.4	19.0		15.8
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	10.0	35.0		27.0	10.0	35.0		27.0
Max Q Clear Time (g_c+I1), s	3.0	11.2		8.5	3.6	9.3		5.2
Green Ext Time (p_c), s	0.1	2.4		1.4	0.1	2.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

SITE LAYOUT

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout



MOVEMENT SUMMARY

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	208	1.0	1.011	48.3	LOS D	23.0	579.8	1.00	1.74	3.10	22.5
8	T1	218	1.0	1.011	43.4	LOS D	23.0	579.8	1.00	1.74	3.10	22.5
18	R2	192	1.0	1.011	43.0	LOS D	23.0	579.8	1.00	1.74	3.10	22.1
Approach		618	1.0	1.011	44.9	LOS D	23.0	579.8	1.00	1.74	3.10	22.4
East: Greenbag Road												
1	L2	34	5.0	0.084	14.5	LOS B	0.3	9.0	0.60	0.81	0.60	32.2
6	T1	517	7.0	0.898	20.3	LOS C	15.1	393.9	1.00	1.30	1.75	29.9
16	R2	146	0.0	0.898	19.5	LOS B	15.1	393.9	1.00	1.30	1.75	29.1
Approach		697	5.4	0.898	19.9	LOS B	15.1	393.9	0.98	1.27	1.69	29.8
North: Dorsey Avenue												
7	L2	153	0.0	0.710	20.8	LOS C	5.8	150.6	0.89	1.10	1.31	30.5
4	T1	28	0.0	0.710	16.0	LOS B	5.8	150.6	0.89	1.10	1.31	30.5
14	R2	168	11.0	0.710	16.7	LOS B	5.8	150.6	0.89	1.10	1.31	29.7
Approach		350	5.3	0.710	18.5	LOS B	5.8	150.6	0.89	1.10	1.31	30.1
West: Greenbag Road												
5	L2	75	8.0	0.139	12.0	LOS B	0.6	15.3	0.44	0.72	0.44	33.5
2	T1	400	7.0	0.466	6.2	LOS A	2.9	78.0	0.52	0.57	0.52	35.5
12	R2	38	15.0	0.466	6.3	LOS A	2.9	78.0	0.52	0.57	0.52	34.1
Approach		513	7.7	0.466	7.0	LOS A	2.9	78.0	0.51	0.59	0.51	35.1
All Vehicles		2178	4.7	1.011	23.7	LOS C	23.0	579.8	0.86	1.22	1.75	28.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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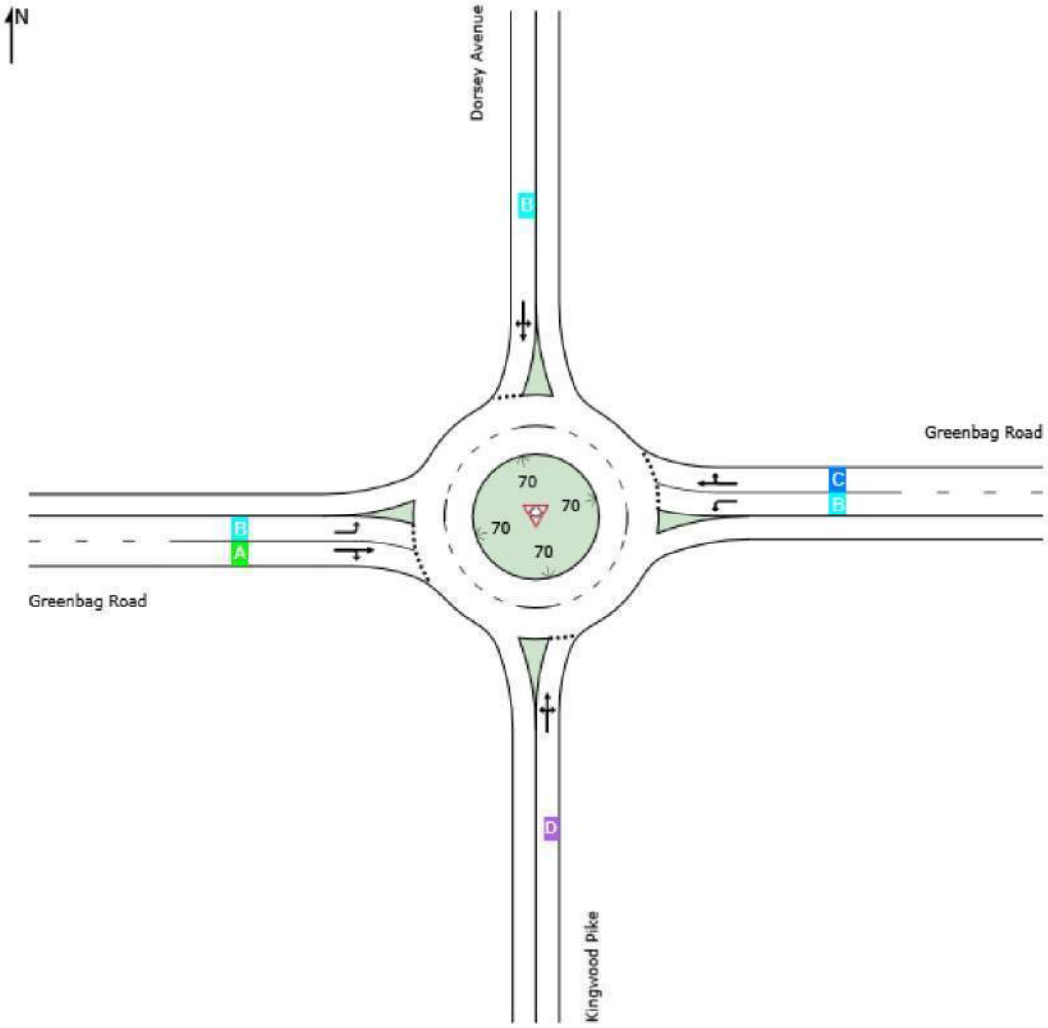
LANE LEVEL OF SERVICE

Lane Level of Service

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	D	B	B	A	C



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

QUEUE DISTANCE (%ILE)

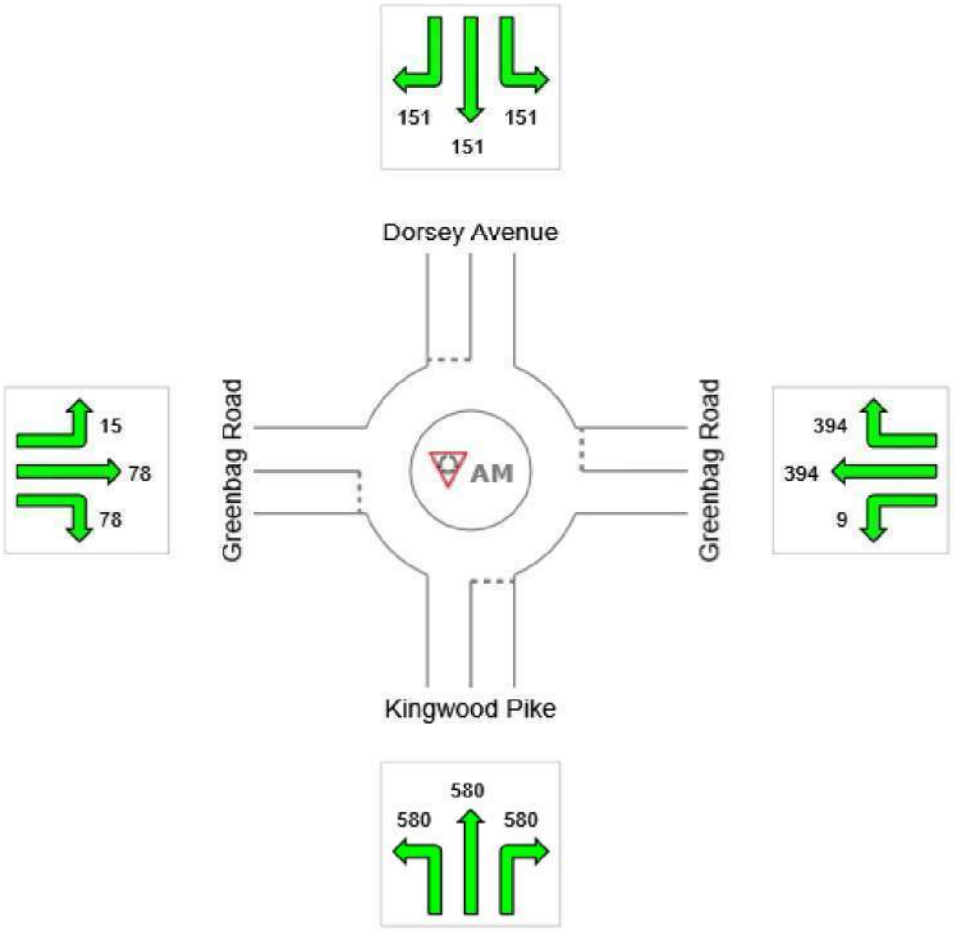
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	580	394	151	78	580



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

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DETAILED OUTPUT

Site: AM [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak]

Roundabout - 2 Lane
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	628	1.05	662	0.0	0.0	N	0.936	19.4	1.55	0.466
N	T1	1	Dominant	628	1.05	662	0.0	0.0	N	0.936	19.4	1.55	0.466
E	R2	1	Dominant	628	1.05	662	0.0	0.0	N	0.936	19.4	1.55	0.466
East: Greenbag Road													
S	L2	1	Subdominant	497	1.02	508	0.0	0.0	N	0.883	17.9	2.00	0.464
W	T1	2	Dominant	497	1.02	508	0.0	0.0	Y	0.883	17.9	2.00	0.464
N	R2	2	Dominant	497	1.02	508	0.0	0.0	Y	0.883	17.9	2.00	0.464

North: Dorsey Avenue											
E	L2	1	Dominant	757	1.05	797	0.0	0.0	Y	0.845	19.7	1.71	0.572
S	T1	1	Dominant	757	1.05	797	0.0	0.0	Y	0.845	19.7	1.71	0.572
W	R2	1	Dominant	757	1.05	797	0.0	0.0	Y	0.845	19.7	1.71	0.572
West: Greenbag Road											
N	L2	1	Subdominant	215	1.01	217	0.0	0.0	N	0.958	15.8	2.00	0.232
E	T1	2	Dominant	215	1.01	217	0.0	0.0	N	0.958	15.8	2.00	0.232
S	R2	2	Dominant	215	1.01	217	0.0	0.0	N	0.958	15.8	2.00	0.232

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.55	0.466	Y	1.01	4.65	132.3	3.13
N	T1	1	Dominant	1.55	0.466	Y	1.01	4.65	132.3	3.13
E	R2	1	Dominant	1.55	0.466	Y	1.01	4.65	132.3	3.13
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.464	Y	1.05	6.32	166.4	4.45
W	T1	2	Dominant	2.00	0.464	Y	1.07	4.13	108.8	2.91
N	R2	2	Dominant	2.00	0.464	Y	1.00	3.86	101.6	2.72
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.71	0.572	Y	1.00	4.12	119.1	3.05
S	T1	1	Dominant	1.71	0.572	Y	1.00	4.12	119.1	3.05
W	R2	1	Dominant	1.71	0.572	Y	1.11	4.57	132.1	3.39
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.232	N	1.08	7.28	168.2	4.82
E	T1	2	Dominant	2.00	0.232	Y	1.07	4.57	105.6	3.02
S	R2	2	Dominant	2.00	0.232	Y	1.15	4.91	113.5	3.25

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway
is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two
successive vehicles across all lanes in the circulating
or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	75	81	12.2%
2	553	581	87.8%
Total	628	662	
East: Greenbag Road			
1	0	0	0.0%
2	497	508	100.0%
Total	497	508	
North: Dorsey Avenue			
1	34	35	4.4%
2	723	762	95.6%
Total	757	797	
West: Greenbag Road			
1	0	0	0.0%
2	215	217	100.0%
Total	215	217	

The SIDRA Standard roundabout capacity model option is in use.
This model takes into account the total circulating flow as well as the effect

of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	192	426	618
Total	192	426	618
East: Greenbag Road			
1	0	34	34
2	146	517	663
Total	146	551	697
North: Dorsey Avenue			
1	168	182	350
Total	168	182	350
West: Greenbag Road			
1	0	75	75
2	38	400	438
Total	38	475	513

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	28.4	22.5	3334.2#	101.0#	131.1	131.1	5.8
	North	T1	28.4	22.5	3334.2#	100.9#	138.0	138.0	6.1
	East	R2	27.8	22.1	3334.2#	102.7#	121.5	121.5	5.5
East: Greenbag Road									
	South	L2	33.2	32.2	3400.3#	72.0#	21.7	21.7	0.7
	West	T1	31.7	29.9	3319.8#	75.8#	325.3	325.3	10.9
	North	R2	30.9	29.1	3319.8#	77.7#	91.6	91.6	3.1
North: Dorsey Avenue									
	East	L2	32.9	30.5	3330.7#	74.5#	96.7	96.7	3.2
	South	T1	32.9	30.5	3330.7#	74.4#	17.8	17.8	0.6
	West	R2	32.0	29.7	3330.7#	76.4#	106.3	106.3	3.6
West: Greenbag Road									
	North	L2	33.7	33.5	3400.3#	69.2#	48.3	48.3	1.4
	East	T1	35.5	35.5	3331.9#	64.0#	252.4	252.4	7.1
	South	R2	34.1	34.1	3331.9#	66.6#	24.0	24.0	0.7
ALL VEHICLES:			31.6	28.2	3332.1#	80.5#	1374.7	1374.7	48.7

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA
West: Greenbag Road								

```
           North    L2      51.0   14.8  200.3   1600     488     NA
            East    T1     144.0   22.0  138.3   1600     488     NA
           South    R2      83.8   17.9   58.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
           App. Speeds    Exit Speeds    Queue
           -----------    -----------   Move-up   Geom
 Mov       Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph       mph       sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     18.1      9.5
    8  T1     40.0   22.0   22.0  40.0     18.1      4.7
   18  R2     40.0   19.0   19.0  40.0     18.1      4.3
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     17.7      9.6
    6  T1     40.0   22.0   22.0  40.0     21.4      4.8
   16  R2     40.0   17.9   17.9  40.0     21.4      4.6
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     17.5      9.5
    4  T1     40.0   22.0   22.0  40.0     17.5      4.7
   14  R2     40.0   19.0   19.0  40.0     17.5      4.3
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     23.3      9.5
    2  T1     40.0   22.0   22.0  40.0     28.7      4.7
   12  R2     40.0   17.9   17.9  40.0     28.7      4.6
-----------------------------------------------------------
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #     208    628    662     205   0.85    -16  1.011*
    8  T1  #     218    628    662     216   0.85    -16  1.011*
   18  R2  #     192    628    662     190   0.85    -16  1.011*
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #      34    497    508     403   0.85    916  0.084
    6  T1  #     517    497    508     576   0.85     -5  0.898
   16  R2  #     146    497    508     162   0.85     -5  0.898
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     153    757    797     216   0.85     20  0.710
    4  T1  #      28    757    797      40   0.85     20  0.710
   14  R2  #     168    757    797     237   0.85     20  0.710
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #      75    215    217     539   0.85    510  0.139
    2  T1  #     400    215    217     859   0.85     83  0.466
   12  R2  #      38    215    217      82   0.85     83  0.466
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   2.78    3.34    48.3   1.74   360.5 26.58    131.1     5.8     22.5
    8  T1   2.64    3.16    43.4   1.74   379.4 26.71    138.0     6.1     22.5
   18  R2   2.30    2.76    43.0   1.74   334.1 25.71    121.5     5.5     22.1
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.14    0.16    14.5   0.81    27.4  1.11     21.7     0.7     32.2
    6  T1   2.91    3.50    20.3   1.30   671.1 26.93    325.3    10.9     29.9
   16  R2   0.79    0.95    19.5   1.30   188.9 10.20     91.6     3.1     29.1
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

	7	L2	0.89	1.06	20.8	1.10	167.9	6.56	96.7	3.2	30.5
	4	T1	0.13	0.15	16.0	1.10	31.0	3.07	17.8	0.6	30.5
	14	R2	0.78	0.94	16.7	1.10	184.6	9.12	106.3	3.6	29.7
West: Greenbag Road											
	5	L2	0.25	0.30	12.0	0.72	53.7	2.22	48.3	1.4	33.5
	2	T1	0.69	0.83	6.2	0.57	229.7	10.64	252.4	7.1	35.5
	12	R2	0.07	0.08	6.3	0.57	21.9	3.15	24.0	0.7	34.1

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	87.11	4.5	40.1	0.04	0.004	0.027
8	T1	91.67	4.7	42.2	0.04	0.004	0.028
18	R2	81.58	6.0	53.2	0.06	0.005	0.041
		260.35	15.2	135.5	0.15	0.014	0.096
East: Greenbag Road							
1	L2	13.35	1.9	17.5	0.02	0.001	0.055
6	T1	149.33	8.4	75.0	0.09	0.009	0.106
16	R2	42.03	2.3	20.8	0.02	0.002	0.026
		204.71	12.6	113.3	0.13	0.012	0.187
North: Dorsey Avenue							
7	L2	61.14	6.9	61.8	0.07	0.006	0.116
4	T1	11.41	1.5	13.8	0.02	0.001	0.023
14	R2	66.52	6.2	55.2	0.06	0.006	0.128
		139.07	14.6	130.8	0.15	0.013	0.268
West: Greenbag Road							
5	L2	27.21	2.5	22.2	0.02	0.002	0.067
2	T1	148.84	21.6	195.7	0.19	0.015	0.739
12	R2	14.58	2.9	27.1	0.02	0.002	0.126
		190.63	27.0	245.0	0.24	0.019	0.932
INTERSECTION:		794.76	69.5	624.5	0.66	0.058	1.483

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.41	29.1	190.1	0.19	0.020	0.128
8	T1	0.41	29.1	190.1	0.19	0.020	0.128
18	R2	0.42	20.4	271.9	0.32	0.027	0.208
		0.41	25.7	215.5	0.23	0.022	0.153
East: Greenbag Road							
1	L2	0.38	11.2	500.5	0.50	0.042	1.584
6	T1	0.29	38.9	143.2	0.17	0.016	0.202
16	R2	0.29	39.3	141.5	0.15	0.015	0.179
		0.29	34.8	160.5	0.18	0.017	0.265
North: Dorsey Avenue							
7	L2	0.39	14.0	396.9	0.46	0.038	0.748
4	T1	0.40	11.5	481.0	0.56	0.048	0.807
14	R2	0.39	17.3	322.8	0.35	0.033	0.749
		0.39	15.1	368.0	0.41	0.036	0.753
West: Greenbag Road							
5	L2	0.35	19.6	285.2	0.29	0.027	0.861
2	T1	0.37	11.7	481.8	0.47	0.037	1.820
12	R2	0.38	8.2	701.0	0.59	0.047	3.266
		0.36	12.0	468.8	0.45	0.036	1.784
INTERSECTION:		0.36	19.8	282.3	0.30	0.026	0.670

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	618	612	1.011	44.9	1.74	23.0	579.8	1600.0
East: Greenbag Road								
1	34	403	0.084	14.5	0.81	0.3	9.0	200.0
2	663	738	0.898	20.1	1.30	15.1	393.9	1600.0
North: Dorsey Avenue								
1	350	493	0.710	18.5	1.10	5.8	150.6	1600.0
West: Greenbag Road								
1	75	539	0.139	12.0	0.72	0.6	15.3	200.0
2	438	941	0.466	6.2	0.57	2.9	78.0	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	618	150	612	1.011	100
East: Greenbag Road					
1	34	34	403	0.084	100
2	663	150	738	0.898	100
North: Dorsey Avenue					
1	350	150	493	0.710	100
West: Greenbag Road					
1	75	75	539	0.139	100
2	438	150	941	0.466	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	618	1		1.011	44.9	580	1600
	618	1		1.011	44.9	580	
East: Greenbag Road							
1	34	5		0.084	14.5	9	200
2	663	5		0.898	20.1	394	1600
	697	5		0.898	19.9	394	
North: Dorsey Avenue							
1	350	5		0.710	18.5	151	1600
	350	5		0.710	18.5	151	
West: Greenbag Road							
1	75	8		0.139	12.0	15	200
2	438	8		0.466	6.2	78	1600
	513	8		0.466	7.0	78	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
2178	5	1.011	23.7	580

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout

-----------------------------------------------------
                                      Average  Driver
 Lane    Satn    Satn    Satn    Satn   Queue  Response
 No.    Speed   Flow    Hdwy   Spacing  Space    Time
         mph    veh/h   sec      ft      ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       18.7   1149    3.13    85.79   25.20    2.21
-----------------------------------------------------
 East: Greenbag Road
 1       14.8    809    4.45    96.67   26.00    3.25
 2       21.1   1256    2.87    88.57   26.09    2.02
-----------------------------------------------------
 North: Dorsey Avenue
 1       17.4   1120    3.21    82.03   26.06    2.19
-----------------------------------------------------
 West: Greenbag Road
 1       14.8    748    4.82   104.68   26.60    3.59
 2       21.6   1183    3.04    96.48   26.54    2.21
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green           dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      1.011    NA      NA     2.9   7.8  31.0  38.7   4.7  34.1  13.2  20.9   6.2   44.9
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.084    NA      NA     4.1   4.9   0.0   4.9   2.8   2.1   0.0   2.1   9.6   14.5
 2      0.898    NA      NA     1.9   5.2  10.2  15.4   5.8   9.6   5.2   4.4   4.7   20.1
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.710    NA      NA     3.8   6.8   5.1  11.9   3.8   8.0   2.6   5.5   6.6   18.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.139    NA      NA     1.8   2.4   0.0   2.4   2.0   0.4   0.0   0.4   9.5   12.0
 2      0.466    NA      NA     0.8   1.5   0.0   1.5   3.1   0.0   0.0   0.0   4.7    6.2
-------------------------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ------------------------     Ratio     Block  SL Ov.
 No.     x   Green           No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    1.011    NA      NA     5.1    3.2   6.0    9.3   23.0  0.15   0.36    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.084    NA      NA     0.0    0.1   0.0    0.1    0.3  0.02   0.04    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
2	0.898	NA	NA	1.9	3.3	2.7	6.1	15.1	0.10	0.25	0.0	NA
North: Dorsey Avenue												
1	0.710	NA	NA	0.5	1.7	0.6	2.3	5.8	0.04	0.09	0.0	NA
West: Greenbag Road												
1	0.139	NA	NA	0.0	0.2	0.0	0.2	0.6	0.03	0.08	0.0	NA
2	0.466	NA	NA	0.0	1.2	0.0	1.2	2.9	0.02	0.05	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	1.011	NA	NA	129.6	81.0	152.3	233.3	579.8	0.15	0.36	0.0	NA
East: Greenbag Road												
1	0.084	NA	NA	0.0	3.6	0.0	3.6	9.0	0.02	0.04	0.0	NA
2	0.898	NA	NA	49.6	87.2	71.3	158.5	393.9	0.10	0.25	0.0	NA
North: Dorsey Avenue												
1	0.710	NA	NA	14.3	44.8	15.8	60.6	150.6	0.04	0.09	0.0	NA
West: Greenbag Road												
1	0.139	NA	NA	0.0	6.1	0.0	6.1	15.3	0.03	0.08	0.0	NA
2	0.466	NA	NA	0.0	31.4	0.0	31.4	78.0	0.02	0.05	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	1.011	NA	NA	5.1	6.7	12.1
East: Greenbag Road						
1	0.084	NA	NA	0.0	0.0	0.1
2	0.898	NA	NA	1.9	2.8	5.1
North: Dorsey Avenue						
1	0.710	NA	NA	0.5	1.2	2.1
West: Greenbag Road						
1	0.139	NA	NA	0.0	0.1	0.1
2	0.466	NA	NA	0.0	0.2	0.3

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	1.011	NA	NA	129.6	167.7	304.2
East: Greenbag Road						
1	0.084	NA	NA	0.0	1.2	2.2
2	0.898	NA	NA	49.6	74.0	134.2
North: Dorsey Avenue						
1	0.710	NA	NA	14.3	30.0	54.5
West: Greenbag Road						
1	0.139	NA	NA	0.0	1.3	2.4
2	0.466	NA	NA	0.0	4.9	8.8

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	1.011	9.3	12.0	16.9	19.6	23.0	25.5	27.4
East: Greenbag Road								
1	0.084	0.1	0.2	0.3	0.3	0.3	0.4	0.4
2	0.898	6.1	7.9	11.1	12.8	15.1	16.8	18.0
North: Dorsey Avenue								
1	0.710	2.3	3.0	4.2	4.9	5.8	6.4	6.9
West: Greenbag Road								
1	0.139	0.2	0.3	0.4	0.5	0.6	0.6	0.7
2	0.466	1.2	1.5	2.2	2.5	2.9	3.3	3.5

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	1.011	233.2	302.0	425.8	493.0	579.8	643.5	691.7
East: Greenbag Road								
1	0.084	3.6	4.7	6.6	7.6	9.0	10.0	10.7
2	0.898	158.4	205.2	289.3	335.0	393.9	437.2	470.0
North: Dorsey Avenue								
1	0.710	60.6	78.5	110.6	128.1	150.6	167.2	179.7
West: Greenbag Road								
1	0.139	6.1	7.9	11.2	13.0	15.3	16.9	18.2
2	0.466	31.4	40.6	57.3	66.3	78.0	86.6	93.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	1.011	NA	NA	1.00	0.74	0.00	1.74	1074.1	2.10	1297.3	1.00	3.10
East: Greenbag Road												
1	0.084	NA	NA	0.55	0.00	0.27	0.81	27.4	0.00	0.0	0.60	0.60
2	0.898	NA	NA	0.99	0.30	0.00	1.30	860.1	0.75	494.6	1.00	1.75
North: Dorsey Avenue												
1	0.710	NA	NA	0.89	0.14	0.07	1.10	383.5	0.42	145.9	0.89	1.31
West: Greenbag Road												
1	0.139	NA	NA	0.34	0.00	0.37	0.72	53.7	0.00	0.0	0.44	0.44
2	0.466	NA	NA	0.36	0.00	0.21	0.57	251.6	0.00	0.0	0.52	0.52

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To: / Turn:	W L2	N T1	E R2	TOT
Flow Rate	207.6	218.5	192.4	618.5
%HV (all designations)	1.0	1.0	1.0	1.0
From EAST To: / Turn:	**S L2**	**W T1**	**N R2**	**TOT**
Flow Rate	33.7	517.4	145.7	696.7
%HV (all designations)	5.0	7.0	0.0	5.4

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	153.3	28.3	168.5	350.0
%HV (all designations)	0.0	0.0	11.0	5.3

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	75.0	400.0	38.0	513.0
%HV (all designations)	8.0	7.0	15.0	7.7

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	205.5	216.3	190.5	612.3
Mov Class %	99.0	99.0	99.0	99.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	2.3	2.4	2.1	6.8

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	32.0	481.2	145.7	658.8
Mov Class %	95.0	93.0	100.0	94.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	153.3	28.3	149.9	331.5
Mov Class %	100.0	100.0	89.0	94.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	69.0	372.0	32.3	473.3
Mov Class %	92.0	93.0	85.0	92.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	2.1	2.2	1.9	6.2
Mov Class %	1.0	1.0	1.0	1.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.1

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	1.7	36.2	0.0	37.9
Mov Class %	5.0	7.0	0.0	5.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	18.5	18.5
Mov Class %	0.0	0.0	11.0	5.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	6.0	28.0	5.7	39.7

Mov Class %	8.0	7.0	15.0	7.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

Site ID: AM
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	205.5	216.3	190.5	612.3
HV	2.1	2.2	1.9	6.2
Total	207.6	218.5	192.4	618.5
Approach	207.6	218.5	192.4	618.5

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	32.0	*	*	32.0
HV	1.7	*	*	1.7
Total	33.7	*	*	33.7
Lane 2				
LV	*	481.2	145.7	626.8
HV	*	36.2	*	36.2
Total	*	517.4	145.7	663.0
Approach	33.7	517.4	145.7	696.7

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	153.3	28.3	149.9	331.5
HV	*	*	18.5	18.5
Total	153.3	28.3	168.5	350.0
Approach	153.3	28.3	168.5	350.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	69.0	*	*	69.0
HV	6.0	*	*	6.0
Total	75.0	*	*	75.0
Lane 2				
LV	*	372.0	32.3	404.3
HV	*	28.0	5.7	33.7
Total	*	400.0	38.0	438.0
Approach	75.0	400.0	38.0	513.0

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT
Exit: SOUTH			
Lane: 1	92.6	7.4	100.0
Total	92.6	7.4	100.0
Exit: EAST			
Lane: 1	715.7	29.9	745.7
Total	715.7	29.9	745.7
Exit: NORTH			
Lane: 1	430.9	8.2	439.1
Total	430.9	8.2	439.1
Exit: WEST			
Lane: 1	836.7	56.8	893.5
Total	836.7	56.8	893.5

* Movement not allocated to the lane

DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

```
-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
Lane:  1           715.7    29.9   745.7
Total              715.7    29.9   745.7
-----------------------------------------
 Exit: NORTH
Lane:  1           430.9     8.2   439.1
Total              430.9     8.2   439.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak

```
Site ID: AM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   3.1%
  Number of Iterations: 7 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     2.5%   1.2%   0.6%

Other Diagnostic Messages (if any):
```

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SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:39:44 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2B - Greenbag & Dorsey-Kingwood With Termination of Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

MOVEMENT SUMMARY

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	79	4.0	0.560	19.5	LOS B	3.5	90.6	0.84	1.01	1.10	31.6
8	T1	88	3.0	0.560	14.6	LOS B	3.5	90.6	0.84	1.01	1.10	31.6
18	R2	75	2.0	0.560	14.0	LOS B	3.5	90.6	0.84	1.01	1.10	30.8
Approach		242	3.0	0.560	16.0	LOS B	3.5	90.6	0.84	1.01	1.10	31.3
East: Greenbag Road												
1	L2	131	0.0	0.244	13.0	LOS B	1.0	26.2	0.53	0.79	0.53	33.1
6	T1	471	1.0	0.722	9.5	LOS A	7.5	189.0	0.77	0.84	0.92	34.8
16	R2	216	0.0	0.722	9.3	LOS A	7.5	189.0	0.77	0.84	0.92	33.8
Approach		818	0.6	0.722	10.0	LOS B	7.5	189.0	0.73	0.83	0.86	34.2
North: Dorsey Avenue												
7	L2	228	1.0	1.031	50.3	LOS D	24.2	608.1	1.00	1.79	3.30	22.0
4	T1	238	0.0	1.031	45.3	LOS D	24.2	608.1	1.00	1.79	3.30	22.1
14	R2	165	2.0	1.031	45.1	LOS D	24.2	608.1	1.00	1.79	3.30	21.7
Approach		631	0.9	1.031	47.0	LOS D	24.2	608.1	1.00	1.79	3.30	21.9
West: Greenbag Road												
5	L2	164	0.0	0.410	17.1	LOS B	2.2	54.8	0.74	0.94	0.83	31.3
2	T1	584	1.0	1.027	45.1	LOS D	30.4	763.7	1.00	1.81	3.07	22.4
12	R2	166	0.0	1.027	44.9	LOS D	30.4	763.7	1.00	1.81	3.07	22.0
Approach		915	0.6	1.027	40.0	LOS D	30.4	763.7	0.95	1.65	2.67	23.6
All Vehicles		2606	0.9	1.031	30.1	LOS C	30.4	763.7	0.88	1.37	2.11	26.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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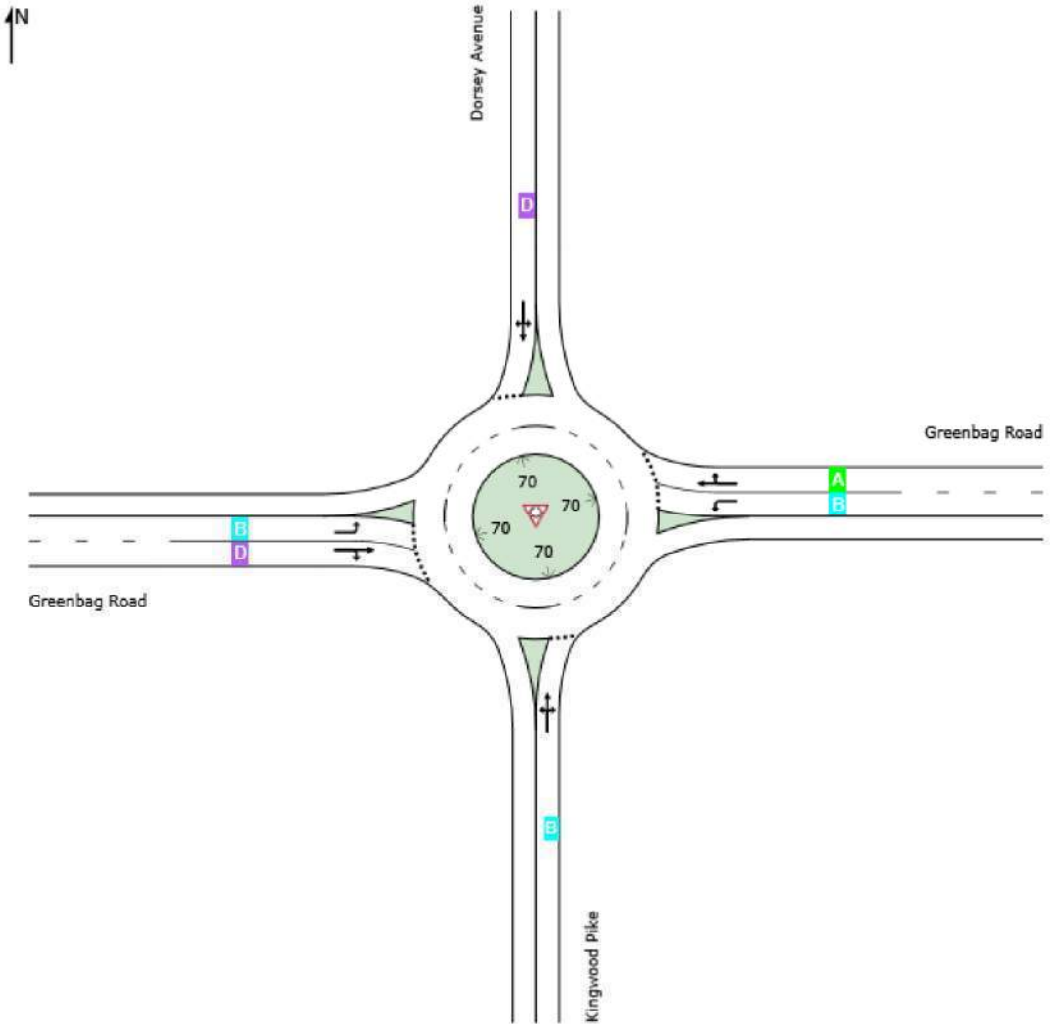
LANE LEVEL OF SERVICE

Lane Level of Service

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	B	D	D	C



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

QUEUE DISTANCE (%ILE)

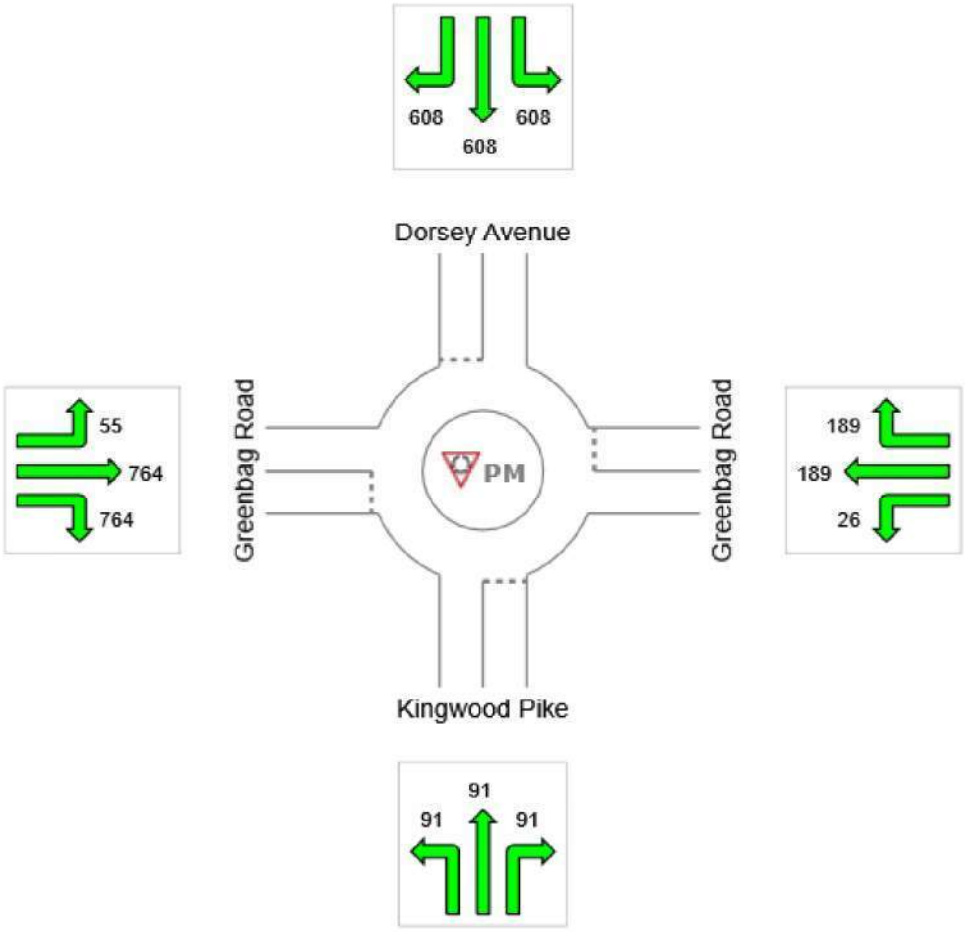
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	91	189	608	764	764



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: PM [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak]

Roundabout - 2 Lane
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Lane Queue Percentiles
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- Origin-Destination Flow Rates (Total)
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- Lane Flow Rates

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- Parameter Settings Summary
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Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Central Island Diam ft	Circ Width ft	Insc Diam. ft	Entry Radius ft	Entry Angle deg	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	959	1.01	967	0.0	0.0	Y	0.801	19.1	1.47	0.589
N	T1	1	Dominant	959	1.01	967	0.0	0.0	Y	0.801	19.1	1.47	0.589
E	R2	1	Dominant	959	1.01	967	0.0	0.0	Y	0.801	19.1	1.47	0.589
East: Greenbag Road													
S	L2	1	Subdominant	330	1.02	336	0.0	0.0	N	0.963	16.7	2.00	0.336
W	T1	2	Dominant	330	1.02	336	0.0	0.0	N	0.963	16.7	2.00	0.336
N	R2	2	Dominant	330	1.02	336	0.0	0.0	N	0.963	16.7	2.00	0.336

North: Dorsey Avenue											
E	L2	1	Dominant	681	1.01	689	0.0	0.0	N	0.894	19.8	1.44	0.455
S	T1	1	Dominant	681	1.01	689	0.0	0.0	N	0.894	19.8	1.44	0.455
W	R2	1	Dominant	681	1.01	689	0.0	0.0	N	0.894	19.8	1.44	0.455
West: Greenbag Road											
N	L2	1	Subdominant	588	1.00	590	0.0	0.0	N	0.865	17.7	2.00	0.517
E	T1	2	Dominant	588	1.00	590	0.0	0.0	Y	0.865	17.7	2.00	0.517
S	R2	2	Dominant	588	1.00	590	0.0	0.0	Y	0.865	17.7	2.00	0.517

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.47	0.589	Y	1.04	4.41	123.8	3.11
N	T1	1	Dominant	1.47	0.589	Y	1.03	4.37	122.6	3.08
E	R2	1	Dominant	1.47	0.589	Y	1.02	4.33	121.4	3.05
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.336	N	1.00	6.43	157.9	4.37
W	T1	2	Dominant	2.00	0.336	Y	1.01	4.14	101.6	2.81
N	R2	2	Dominant	2.00	0.336	Y	1.00	4.10	100.5	2.78
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.44	0.455	Y	1.01	4.30	124.5	3.12
S	T1	1	Dominant	1.44	0.455	Y	1.00	4.25	123.3	3.09
W	R2	1	Dominant	1.44	0.455	Y	1.02	4.34	125.8	3.16
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.517	Y	1.00	5.84	151.6	4.17
E	T1	2	Dominant	2.00	0.517	Y	1.01	3.80	98.6	2.71
S	R2	2	Dominant	2.00	0.517	Y	1.00	3.76	97.6	2.69

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway
is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two
successive vehicles across all lanes in the circulating
or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	164	164	17.0%
2	795	803	83.0%
Total	959	967	
East: Greenbag Road			
1	0	0	0.0%
2	330	336	100.0%
Total	330	336	
North: Dorsey Avenue			
1	131	131	19.1%
2	549	557	80.9%
Total	680	688	
West: Greenbag Road			
1	0	0	0.0%
2	588	590	100.0%
Total	588	590	

The SIDRA Standard roundabout capacity model option is in use.
This model takes into account the total circulating flow as well as the effect

of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	75	167	242
Total	75	167	242
East: Greenbag Road			
1	0	131	131
2	216	471	687
Total	216	602	818
North: Dorsey Avenue			
1	165	466	631
Total	165	466	631
West: Greenbag Road			
1	0	164	164
2	166	585	751
Total	166	749	915

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	33.6	31.6	3333.1#	72.0#	49.6	49.6	1.6
	North	T1	33.7	31.6	3333.1#	71.9#	55.3	55.3	1.7
	East	R2	32.7	30.8	3333.1#	73.7#	47.5	47.5	1.5
East: Greenbag Road									
	South	L2	33.6	33.1	3400.3#	70.1#	84.7	84.7	2.6
	West	T1	34.8	34.8	3313.1#	65.0#	295.4	295.4	8.5
	North	R2	33.8	33.8	3313.1#	66.9#	135.4	135.4	4.0
North: Dorsey Avenue									
	East	L2	27.9	22.0	3340.0#	103.4#	144.3	144.3	6.6
	South	T1	28.0	22.1	3340.0#	103.2#	150.7	150.7	6.8
	West	R2	27.4	21.7	3340.0#	105.1#	104.5	104.5	4.8
West: Greenbag Road									
	North	L2	32.8	31.3	3400.3#	74.2#	105.6	105.6	3.4
	East	T1	28.2	22.4	3320.5#	100.9#	367.4	367.4	16.4
	South	R2	27.5	22.0	3320.5#	102.8#	104.6	104.6	4.8
ALL VEHICLES:			30.8	26.3	3333.5#	86.5#	1645.0	1645.0	62.6

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA
West: Greenbag Road								

```
            North    L2      51.0   14.8  200.3   1600     488     NA
             East    T1     144.0   22.0  138.3   1600     488     NA
            South    R2      83.8   17.9   58.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph       mph       sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     16.4      9.6
    8  T1     40.0   22.0   22.0  40.0     16.4      4.7
   18  R2     40.0   19.0   19.0  40.0     16.4      4.3
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     20.0      9.5
    6  T1     40.0   22.0   22.0  40.0     24.4      4.7
   16  R2     40.0   17.9   17.9  40.0     24.4      4.6
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     17.8      9.5
    4  T1     40.0   22.0   22.0  40.0     17.8      4.7
   14  R2     40.0   19.0   19.0  40.0     17.8      4.3
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     17.1      9.5
    2  T1     40.0   22.0   22.0  40.0     20.5      4.7
   12  R2     40.0   17.9   17.9  40.0     20.5      4.6
-----------------------------------------------------------
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      79    959    967     140   0.85     52  0.560
    8  T1  #      88    959    967     156   0.85     52  0.560
   18  R2  #      75    959    967     134   0.85     52  0.560
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #     131    330    336     539   0.85    248  0.244
    6  T1  #     471    330    336     652   0.85     18  0.722
   16  R2  #     216    330    336     299   0.85     18  0.722
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     228    681    689     221   0.85    -18  1.031*
    4  T1  #     238    681    689     231   0.85    -18  1.031*
   14  R2  #     165    681    689     160   0.85    -18  1.031*
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #     164    588    590     400   0.85    107  0.410
    2  T1  #     584    588    590     569   0.85    -17  1.027
   12  R2  #     166    588    590     162   0.85    -17  1.027
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.43    0.51    19.5   1.01    79.5  4.96     49.6     1.6     31.6
    8  T1   0.35    0.43    14.6   1.01    88.6  5.08     55.3     1.7     31.6
   18  R2   0.29    0.35    14.0   1.01    76.1  4.75     47.5     1.5     30.8
-------------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.48    0.57    13.0   0.79   104.5  3.59     84.7     2.6     33.1
    6  T1   1.24    1.49     9.5   0.84   394.4 16.87    295.4     8.5     34.8
   16  R2   0.56    0.67     9.3   0.84   180.7  7.97    135.4     4.0     33.8
-------------------------------------------------------------------------------------------
North: Dorsey Avenue
```

```
    7  L2    3.18    3.82    50.3   1.79   409.2 28.50    144.3     6.6     22.0
    4  T1    3.00    3.60    45.3   1.79   427.4 18.86    150.7     6.8     22.1
   14  R2    2.07    2.48    45.1   1.79   296.3 25.76    104.5     4.8     21.7
--------------------------------------------------------------------------------
West: Greenbag Road
    5  L2    0.78    0.93    17.1   0.94   154.8  5.16    105.6     3.4     31.3
    2  T1    7.32    8.78    45.1   1.81  1056.6 46.81    367.4    16.4     22.4
   12  R2    2.07    2.49    44.9   1.81   300.7 18.57    104.6     4.8     22.0
--------------------------------------------------------------------------------
```

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Total   Total    Total    Total    Total   Total
                  $/h     gal/h    kg/h     kg/h     kg/h    kg/h
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2          23.27    1.5    13.4     0.01    0.001   0.017
    8  T1          25.93    1.7    14.9     0.02    0.002   0.018
   18  R2          22.63    2.2    19.4     0.02    0.002   0.025
                 ---------------------------------------------
                  71.82    5.3    47.6     0.06    0.005   0.060
-----------------------------------------------------------------
East: Greenbag Road
    1  L2          43.69    5.5    48.8     0.06    0.005   0.024
    6  T1         107.71    6.0    53.2     0.06    0.005   0.022
   16  R2          49.36    2.7    24.3     0.03    0.002   0.009
                 ---------------------------------------------
                 200.76   14.2   126.3     0.15    0.013   0.055
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2         115.15   10.4    93.1     0.11    0.010   0.084
    4  T1         121.30   13.1   116.2     0.14    0.013   0.090
   14  R2          82.65    6.0    53.7     0.06    0.006   0.047
                 ---------------------------------------------
                 319.11   29.5   263.0     0.31    0.028   0.221
-----------------------------------------------------------------
West: Greenbag Road
    5  L2          59.43    4.3    38.4     0.04    0.004   0.016
    2  T1         275.71   25.3   226.0     0.27    0.023   0.210
   12  R2          79.20    8.7    77.6     0.09    0.008   0.062
                 ---------------------------------------------
                 414.34   38.4   342.0     0.40    0.036   0.288
-----------------------------------------------------------------
 INTERSECTION:  1006.02   87.4   779.0     0.91    0.081   0.624
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC      NOX
 ID               Rate    Eff.     Rate     Rate     Rate    Rate
                  $/mi    mpg      g/km     g/km     g/km    g/km
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2           0.29   33.2    167.2     0.19    0.017   0.209
    8  T1           0.29   33.2    167.0     0.18    0.017   0.206
   18  R2           0.30   21.9    253.8     0.31    0.024   0.329
                 ---------------------------------------------
                    0.29   28.6    194.1     0.23    0.019   0.245
-----------------------------------------------------------------
East: Greenbag Road
    1  L2           0.32   15.4    358.2     0.45    0.038   0.178
    6  T1           0.23   49.4    111.9     0.13    0.011   0.046
   16  R2           0.23   49.5    111.7     0.12    0.011   0.042
                 ---------------------------------------------
                    0.24   36.3    152.3     0.18    0.015   0.066
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2           0.50   13.8    400.8     0.47    0.041   0.360
    4  T1           0.50   11.5    479.4     0.58    0.052   0.370
   14  R2           0.49   17.3    319.4     0.34    0.035   0.282
                 ---------------------------------------------
                    0.50   13.5    409.1     0.48    0.044   0.343
-----------------------------------------------------------------
West: Greenbag Road
    5  L2           0.35   24.5    225.7     0.25    0.024   0.097
    2  T1           0.47   14.5    382.2     0.45    0.039   0.355
   12  R2           0.47   12.0    461.2     0.56    0.049   0.366
                 ---------------------------------------------
                    0.45   15.1    367.9     0.44    0.038   0.310
-----------------------------------------------------------------
 INTERSECTION:      0.38   18.8    294.2     0.35    0.031   0.236
-----------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	242	431	0.560	16.0	1.01	3.5	90.6	1600.0
East: Greenbag Road								
1	131	539	0.244	13.0	0.79	1.0	26.2	200.0
2	687	951	0.722	9.4	0.84	7.5	189.0	1600.0
North: Dorsey Avenue								
1	631	613	1.031	47.0	1.79	24.2	608.1	1600.0
West: Greenbag Road								
1	164	400	0.410	17.1	0.94	2.2	54.8	200.0
2	751	731	1.027	45.1	1.81	30.4	763.7	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	242	150	431	0.560	100
East: Greenbag Road					
1	131	131	539	0.244	100
2	687	150	951	0.722	100
North: Dorsey Avenue					
1	631	150	613	1.031	100
West: Greenbag Road					
1	164	150	400	0.410	100
2	751	150	731	1.027	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	242	3		0.560	16.0	91	1600
	242	3		0.560	16.0	91	
East: Greenbag Road							
1	131	0		0.244	13.0	26	200
2	687	1		0.722	9.4	189	1600
	818	1		0.722	10.0	189	
North: Dorsey Avenue							
1	631	1		1.031	47.0	608	1600
	631	1		1.031	47.0	608	
West: Greenbag Road							
1	164	0		0.410	17.1	55	200
2	751	1		1.027	45.1	764	1600
	915	1		1.027	40.0	764	

ALL VEHICLES Total Flow	% HV	Max X	Aver. Delay	Max Queue
2606	1	1.031	30.1	764

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout

-----------------------------------------------------------
                                        Average  Driver
 Lane   Satn    Satn    Satn    Satn     Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------------
 South: Kingwood Pike
 1       18.7   1169    3.08    84.61    25.60    2.15
-----------------------------------------------------------
 East: Greenbag Road
 1       14.8    824    4.37    94.93    25.00    3.22
 2       20.7   1286    2.80    84.98    25.14    1.97
-----------------------------------------------------------
 North: Dorsey Avenue
 1       18.6   1154    3.12    85.16    25.18    2.20
-----------------------------------------------------------
 West: Greenbag Road
 1       14.8    863    4.17    90.70    25.00    3.02
 2       21.1   1330    2.71    83.65    25.16    1.89
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.560    NA      NA     4.5   7.0   2.9   9.9   4.0   5.8   1.5   4.3   6.2   16.0
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.244    NA      NA     2.4   3.5   0.0   3.5   2.4   1.0   0.0   1.0   9.5   13.0
 2      0.722    NA      NA     1.1   2.9   1.8   4.8   4.4   0.4   0.4   0.0   4.7    9.4
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      1.031    NA      NA     2.5   6.6  34.1  40.7   4.8  36.2  14.3  21.8   6.3   47.0
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.410    NA      NA     4.4   6.6   0.9   7.5   3.4   4.1   0.5   3.6   9.5   17.1
 2      1.027    NA      NA     2.2   6.0  34.4  40.4   5.8  34.7  14.1  20.6   4.7   45.1
-------------------------------------------------------------------------------------------------
  SIDRA Standard Delay Model is used.  Control Delay is the sum of Stop-line Delay
  and Geometric Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
        Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane   Satn  During  Factor   Queue   ------------------------    Ratio     Block  SL Ov.
 No.      x   Green            No      Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1     0.560    NA      NA     0.2    1.2   0.2    1.4    3.5  0.02   0.06    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1     0.244    NA      NA     0.0    0.4   0.0    0.4    1.0  0.05   0.13    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
2	0.722	NA	NA	0.4	2.3	0.7	3.0	7.5	0.05	0.12	0.0	NA
North: Dorsey Avenue												
1	1.031	NA	NA	5.7	3.2	6.5	9.7	24.2	0.15	0.38	0.0	NA
West: Greenbag Road												
1	0.410	NA	NA	0.1	0.8	0.1	0.9	2.2	0.11	0.27	0.0	NA
2	1.027	NA	NA	6.8	4.1	8.1	12.2	30.4	0.19	0.48	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.560	NA	NA	6.0	31.0	5.5	36.4	90.6	0.02	0.06	0.0	NA
East: Greenbag Road												
1	0.244	NA	NA	0.0	10.5	0.0	10.5	26.2	0.05	0.13	0.0	NA
2	0.722	NA	NA	10.2	58.9	17.2	76.1	189.0	0.05	0.12	0.0	NA
North: Dorsey Avenue												
1	1.031	NA	NA	144.2	80.1	164.6	244.7	608.1	0.15	0.38	0.0	NA
West: Greenbag Road												
1	0.410	NA	NA	1.6	20.6	1.5	22.1	54.8	0.11	0.27	0.0	NA
2	1.027	NA	NA	170.2	104.0	203.2	307.3	763.7	0.19	0.48	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.560	NA	NA	0.2	0.7	1.2
East: Greenbag Road						
1	0.244	NA	NA	0.0	0.1	0.2
2	0.722	NA	NA	0.4	0.9	1.7
North: Dorsey Avenue						
1	1.031	NA	NA	5.7	7.1	13.0
West: Greenbag Road						
1	0.410	NA	NA	0.1	0.3	0.6
2	1.027	NA	NA	6.8	8.4	15.3

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.560	NA	NA	6.0	16.9	30.7
East: Greenbag Road						
1	0.244	NA	NA	0.0	3.2	5.8
2	0.722	NA	NA	10.2	22.9	41.5
North: Dorsey Avenue						
1	1.031	NA	NA	144.2	179.8	326.1
West: Greenbag Road						
1	0.410	NA	NA	1.6	8.6	15.6
2	1.027	NA	NA	170.2	211.9	384.3

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.560	1.4	1.8	2.6	3.0	3.5	3.9	4.2
East: Greenbag Road								
1	0.244	0.4	0.5	0.8	0.9	1.0	1.2	1.2
2	0.722	3.0	3.9	5.5	6.4	7.5	8.3	9.0
North: Dorsey Avenue								
1	1.031	9.7	12.6	17.7	20.5	24.2	26.8	28.8
West: Greenbag Road								
1	0.410	0.9	1.1	1.6	1.9	2.2	2.4	2.6
2	1.027	12.2	15.8	22.3	25.8	30.4	33.7	36.2

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
		Percentile Back of Queue (feet)						
South: Kingwood Pike								
1	0.560	36.4	47.2	66.5	77.0	90.6	100.5	108.1
East: Greenbag Road								
1	0.244	10.5	13.6	19.2	22.3	26.2	29.1	31.2
2	0.722	76.0	98.5	138.8	160.8	189.0	209.8	225.5
North: Dorsey Avenue								
1	1.031	244.5	316.8	446.6	517.1	608.1	674.9	725.5
West: Greenbag Road								
1	0.410	22.0	28.6	40.3	46.6	54.8	60.8	65.4
2	1.027	307.1	397.9	560.9	649.4	763.7	847.7	911.2

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.560	NA	NA	0.84	0.08	0.09	1.01	244.1	0.25	60.9	0.84	1.10
East: Greenbag Road												
1	0.244	NA	NA	0.48	0.00	0.32	0.79	104.5	0.00	0.0	0.53	0.53
2	0.722	NA	NA	0.66	0.07	0.10	0.84	575.1	0.16	106.7	0.77	0.92
North: Dorsey Avenue												
1	1.031	NA	NA	1.00	0.79	0.00	1.79	1133.0	2.30	1450.2	1.00	3.30
West: Greenbag Road												
1	0.410	NA	NA	0.74	0.03	0.17	0.94	154.8	0.09	14.2	0.74	0.83
2	1.027	NA	NA	1.00	0.81	0.00	1.81	1357.4	2.07	1551.9	1.00	3.07

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	78.7	87.6	75.3	241.6
%HV (all designations)	4.0	3.0	2.0	3.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	470.8	215.7	818.0
%HV (all designations)	0.0	1.0	0.0	0.6

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	228.1	238.2	165.2	631.5
%HV (all designations)	1.0	0.0	2.0	0.9

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	584.3	166.3	914.6
%HV (all designations)	0.0	1.0	0.0	0.6

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

Site ID: PM
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	75.5	85.0	73.8	234.3
Mov Class %	96.0	97.0	98.0	97.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	466.1	215.7	813.3
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	225.8	238.2	161.9	625.9
Mov Class %	99.0	100.0	98.0	99.1
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	6.8	7.1	4.9	18.8

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	578.4	166.3	908.8
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	15.4	4.4	19.8

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	3.1	2.6	1.5	7.3
Mov Class %	4.0	3.0	2.0	3.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	4.7	0.0	4.7
Mov Class %	0.0	1.0	0.0	0.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	2.3	0.0	3.3	5.6
Mov Class %	1.0	0.0	2.0	0.9
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.1	0.0	0.1	0.2

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	5.8	0.0	5.8

```
 Mov Class %           0.0     1.0     0.0     0.6
 Flow Scale           1.00    1.00    1.00       -
 Peak Flow Factor     0.89    0.89    0.89       -
 Residual Demand       0.0     0.2     0.0     0.2
-----------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              75.5    85.0    73.8   234.3
   HV               3.1     2.6     1.5     7.3
   Total           78.7    87.6    75.3   241.6
-------------------------------------------------
 Approach          78.7    87.6    75.3   241.6
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             131.5       *       *   131.5
   Total          131.5       *       *   131.5
 Lane  2
   LV                 *   466.1   215.7   681.8
   HV                 *     4.7       *     4.7
   Total              *   470.8   215.7   686.5
-------------------------------------------------
 Approach         131.5   470.8   215.7   818.0
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             225.8   238.2   161.9   625.9
   HV               2.3       *     3.3     5.6
   Total          228.1   238.2   165.2   631.5
-------------------------------------------------
 Approach         228.1   238.2   165.2   631.5
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             164.0       *       *   164.0
   Total          164.0       *       *   164.0
 Lane  2
   LV                 *   578.4   166.3   744.7
   HV                 *     5.8       *     5.8
   Total              *   584.3   166.3   750.6
-------------------------------------------------
 Approach         164.0   584.3   166.3   914.6
-------------------------------------------------
   *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           878.0     9.6   887.6
Total              878.0     9.6   887.6
-----------------------------------------
 Exit: NORTH
Lane:  1           464.8     2.6   467.4
Total              464.8     2.6   467.4
-----------------------------------------
 Exit: WEST
Lane:  1           703.4    11.2   714.6
Total              703.4    11.2   714.6
-----------------------------------------
   *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
```

```
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           878.0     9.6   887.6
Total              878.0     9.6   887.6
-----------------------------------------
 Exit: NORTH
Lane:  1           464.8     2.6   467.4
Total              464.8     2.6   467.4
-----------------------------------------
 Exit: WEST
Lane:  1           703.4    11.2   714.6
Total              703.4    11.2   714.6
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  SIDRA Standard Delay model used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak

```
Site ID: PM
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   4.9%
  Number of Iterations: 6 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     5.8%   2.9%   0.8%

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:39:44 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2B - Greenbag & Dorsey-Kingwood With Termination of Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

MOVEMENT SUMMARY

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	59	0.0	0.232	8.0	LOS A	1.0	25.5	0.57	0.53	0.57	32.3
8	T1	58	0.0	0.232	8.0	LOS A	1.0	25.5	0.57	0.53	0.57	32.4
18	R2	43	0.0	0.232	8.0	LOS A	1.0	25.5	0.57	0.53	0.57	31.6
Approach		160	0.0	0.232	8.0	LOS A	1.0	25.5	0.57	0.53	0.57	32.2
East: Greenbag Road												
1	L2	63	0.0	0.103	7.1	LOS A	0.4	9.8	0.38	0.28	0.38	31.4
6	T1	260	1.0	0.330	6.8	LOS A	1.7	41.9	0.40	0.28	0.40	33.7
16	R2	85	0.0	0.330	6.7	LOS A	1.7	41.9	0.40	0.28	0.40	32.8
Approach		408	0.6	0.330	6.8	LOS A	1.7	41.9	0.39	0.28	0.39	33.2
North: Dorsey Avenue												
7	L2	105	0.0	0.328	8.5	LOS A	1.5	37.2	0.51	0.46	0.51	32.0
4	T1	64	0.0	0.328	8.5	LOS A	1.5	37.2	0.51	0.46	0.51	32.0
14	R2	87	3.0	0.328	8.6	LOS A	1.5	37.2	0.51	0.46	0.51	31.2
Approach		256	1.0	0.328	8.5	LOS A	1.5	37.2	0.51	0.46	0.51	31.7
West: Greenbag Road												
5	L2	92	3.0	0.160	8.3	LOS A	0.6	16.3	0.43	0.34	0.43	30.9
2	T1	329	1.0	0.399	7.8	LOS A	2.2	55.4	0.45	0.33	0.45	33.2
12	R2	80	2.0	0.399	7.9	LOS A	2.2	55.4	0.45	0.33	0.45	32.2
Approach		500	1.5	0.399	7.9	LOS A	2.2	55.4	0.45	0.33	0.45	32.6
All Vehicles		1324	1.0	0.399	7.7	LOS A	2.2	55.4	0.46	0.36	0.46	32.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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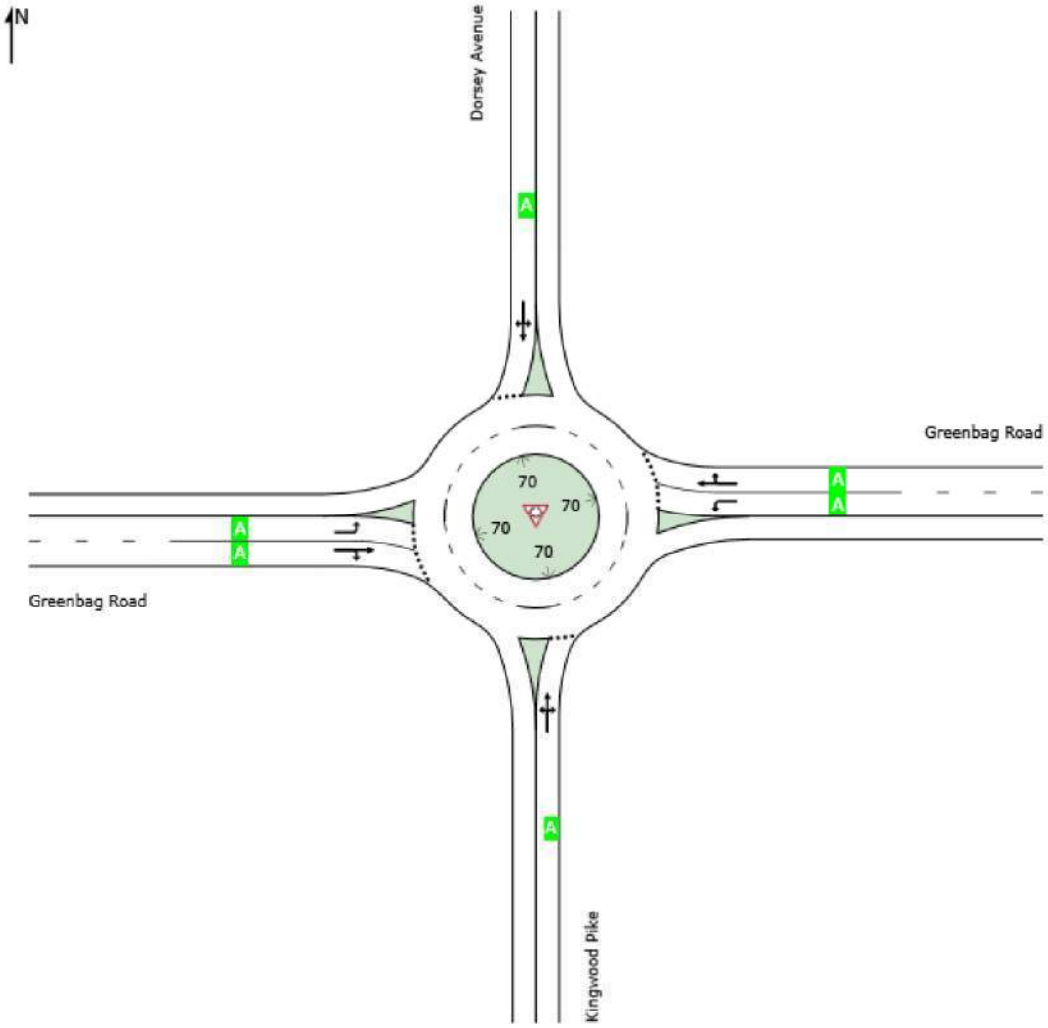
LANE LEVEL OF SERVICE

Lane Level of Service

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

QUEUE DISTANCE (%ILE)

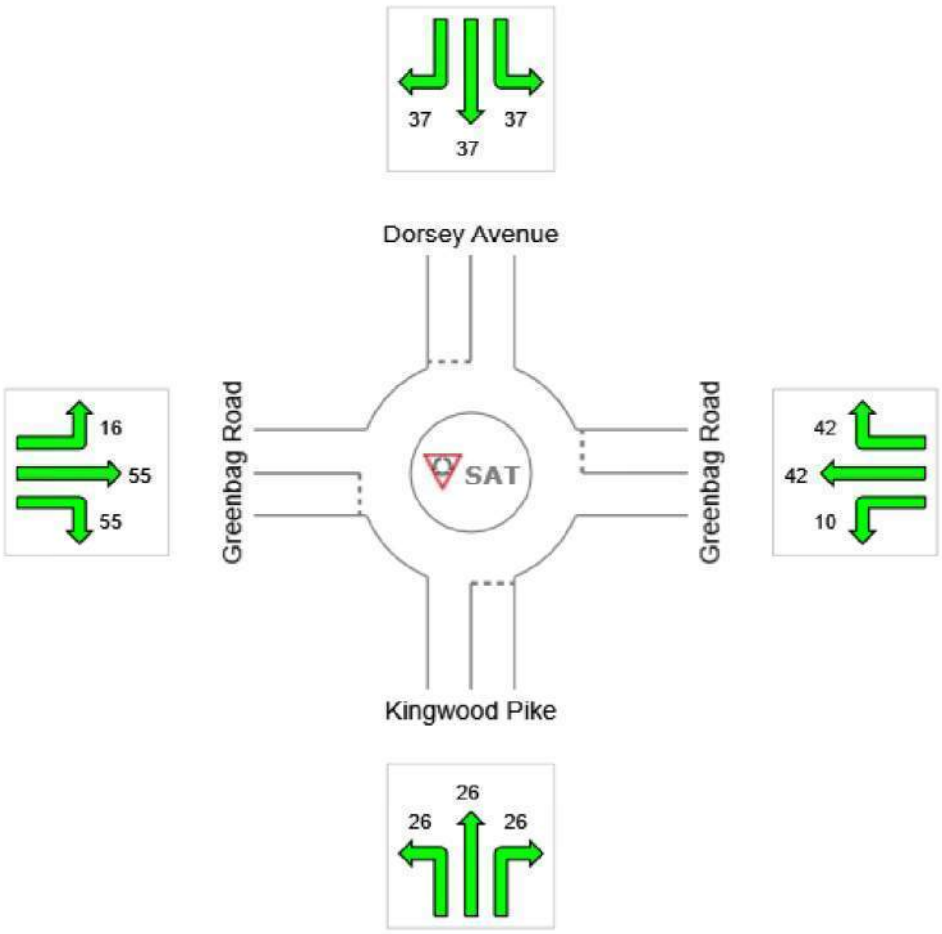
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	26	42	37	55	55



Colour code based on Queue Storage Ratio

[< 0.6]	[0.6 – 0.7]	[0.7 – 0.8]	[0.8 – 0.9]	[0.9 – 1.0]	[> 1.0]

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DETAILED OUTPUT

Site: SAT [Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak]

Roundabout - 2 Lane
Site Category: SAT Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0	40.0	150.0	65.0	30.0	2	1	13.00	1600	NA	0.0N
East: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N
North: Dorsey Avenue										
70.0	40.0	150.0	65.0	30.0	2	1	14.00	1600	NA	0.0N
West: Greenbag Road										
70.0	40.0	150.0	65.0	30.0	2	2	14.00	1600	NA	0.0N

Roundabout Capacity Model: SIDRA Standard
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	526	1.01	532	0.0	0.0	N	0.955	19.3	1.46	0.376
N	T1	1	Dominant	526	1.01	532	0.0	0.0	N	0.955	19.3	1.46	0.376
E	R2	1	Dominant	526	1.01	532	0.0	0.0	N	0.955	19.3	1.46	0.376
East: Greenbag Road													
S	L2	1	Subdominant	209	1.01	212	0.0	0.0	N	0.983	16.8	2.00	0.227
W	T1	2	Dominant	209	1.01	212	0.0	0.0	N	0.983	16.8	2.00	0.227

N	R2	2 Dominant	209	1.01	212	0.0	0.0	N	0.983	16.8	2.00	0.227
North: Dorsey Avenue												
E	L2	1 Dominant	383	1.01	385	0.0	0.0	N	0.970	19.7	1.48	0.293
S	T1	1 Dominant	383	1.01	385	0.0	0.0	N	0.970	19.7	1.48	0.293
W	R2	1 Dominant	383	1.01	385	0.0	0.0	N	0.970	19.7	1.48	0.293
West: Greenbag Road												
N	L2	1 Subdominant	233	1.00	233	0.0	0.0	N	0.978	16.8	2.00	0.246
E	T1	2 Dominant	233	1.00	233	0.0	0.0	N	0.978	16.8	2.00	0.246
S	R2	2 Dominant	233	1.00	233	0.0	0.0	N	0.978	16.8	2.00	0.246

Roundabout Capacity Model: SIDRA Standard

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
W	L2	1	Dominant	1.46	0.376	N	1.00	4.79	135.5	3.15
N	T1	1	Dominant	1.46	0.376	N	1.00	4.79	135.5	3.15
E	R2	1	Dominant	1.46	0.376	N	1.00	4.79	135.5	3.15
East: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
S	L2	1	Subdominant	2.00	0.227	N	1.00	6.75	166.5	4.46
W	T1	2	Dominant	2.00	0.227	Y	1.01	4.32	106.5	2.86
N	R2	2	Dominant	2.00	0.227	Y	1.00	4.28	105.5	2.83
North: Dorsey Avenue										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
E	L2	1	Dominant	1.48	0.293	Y	1.00	4.67	134.9	3.21
S	T1	1	Dominant	1.48	0.293	Y	1.00	4.67	134.9	3.21
W	R2	1	Dominant	1.48	0.293	N	1.03	4.81	139.0	3.30
West: Greenbag Road										
Environment Factor: 1.20										
Entry/Circ. Flow Adjustment: None										
N	L2	1	Subdominant	2.00	0.246	N	1.03	6.90	169.9	4.58
E	T1	2	Dominant	2.00	0.246	Y	1.01	4.29	105.7	2.85
S	R2	2	Dominant	2.00	0.246	Y	1.02	4.33	106.7	2.88

Roundabout Capacity Model: SIDRA Standard
Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	92	95	17.8%
2	434	437	82.2%
Total	526	532	
East: Greenbag Road			
1	0	0	0.0%
2	209	212	100.0%
Total	209	212	
North: Dorsey Avenue			
1	63	63	16.4%
2	319	322	83.6%
Total	382	385	
West: Greenbag Road			
1	0	0	0.0%
2	233	233	100.0%
Total	233	233	

The SIDRA Standard roundabout capacity model option is in use.

This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
South: Kingwood Pike			
1	43	117	160
Total	43	117	160
East: Greenbag Road			
1	0	63	63
2	85	260	345
Total	85	323	408
North: Dorsey Avenue			
1	87	169	256
Total	87	169	256
West: Greenbag Road			
1	0	92	92
2	80	328	408
Total	80	420	500

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Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
South: Kingwood Pike									
	West	L2	35.0	32.3	3339.8#	70.4#	37.4	37.4	1.2
	North	T1	35.0	32.4	3339.8#	70.3#	36.8	36.8	1.1
	East	R2	34.1	31.6	3339.8#	72.1#	27.1	27.1	0.9
East: Greenbag Road									
	South	L2	33.9	31.4	3400.3#	73.7#	40.7	40.7	1.3
	West	T1	36.2	33.7	3318.6#	67.1#	163.5	163.5	4.8
	North	R2	35.1	32.8	3318.6#	69.0#	53.2	53.2	1.6
North: Dorsey Avenue									
	East	L2	35.1	32.0	3337.4#	71.1#	66.4	66.4	2.1
	South	T1	35.1	32.0	3337.4#	71.0#	40.6	40.6	1.3
	West	R2	34.1	31.2	3337.4#	72.9#	54.8	54.8	1.8
West: Greenbag Road									
	North	L2	33.8	30.9	3400.3#	75.0#	59.1	59.1	1.9
	East	T1	35.9	33.2	3322.9#	68.2#	206.8	206.8	6.2
	South	R2	34.8	32.2	3322.9#	70.3#	50.1	50.1	1.6
ALL VEHICLES:			35.2	32.5	3335.7#	69.9#	836.8	836.8	25.7

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
South: Kingwood Pike								
	West	L2	51.0	14.8	200.3	1600	488	NA
	North	T1	144.0	22.0	138.3	1600	488	NA
	East	R2	98.8	19.0	58.2	1600	488	NA
East: Greenbag Road								
	South	L2	51.0	14.8	200.3	1600	488	NA
	West	T1	144.0	22.0	138.3	1600	488	NA
	North	R2	83.8	17.9	58.6	1600	488	NA
North: Dorsey Avenue								
	East	L2	51.0	14.8	200.3	1600	488	NA
	South	T1	144.0	22.0	138.3	1600	488	NA
	West	R2	97.8	19.0	58.3	1600	488	NA

```
West: Greenbag Road
            North    L2      51.0   14.8  200.3   1600     488     NA
             East    T1     144.0   22.0  138.3   1600     488     NA
            South    R2      83.8   17.9   58.6   1600     488     NA
------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn    Negn Cruise    Speed    Delay
 ID   Turn   mph    mph     mph   mph       mph      sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.8   14.8  40.0     19.2      0.0
    8  T1     40.0   22.0   22.0  40.0     19.2      0.0
   18  R2     40.0   19.0   19.0  40.0     19.2      0.0
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     23.6      0.0
    6  T1     40.0   22.0   22.0  40.0     29.0      0.0
   16  R2     40.0   17.9   17.9  40.0     29.0      0.0
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     21.3      0.0
    4  T1     40.0   22.0   22.0  40.0     21.3      0.0
   14  R2     40.0   19.0   19.0  40.0     21.3      0.0
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.8   14.8  40.0     22.7      0.0
    2  T1     40.0   22.0   22.0  40.0     28.0      0.0
   12  R2     40.0   17.9   17.9  40.0     28.0      0.0
-----------------------------------------------------------
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


MOVEMENT CAPACITY PARAMETERS

-------------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-------------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      59    526    532     255   0.85    266  0.232
    8  T1  #      58    526    532     251   0.85    266  0.232
   18  R2  #      43    526    532     185   0.85    266  0.232
-------------------------------------------------------------------
East: Greenbag Road
    1  L2  #      63    209    212     612   0.85    722  0.103
    6  T1  #     260    209    212     789   0.85    158  0.330
   16  R2  #      85    209    212     257   0.85    158  0.330
-------------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     105    383    385     320   0.85    159  0.328
    4  T1  #      64    383    385     196   0.85    159  0.328
   14  R2  #      87    383    385     264   0.85    159  0.328
-------------------------------------------------------------------
West: Greenbag Road
    5  L2  #      92    233    233     576   0.85    433  0.160
    2  T1  #     329    233    233     824   0.85    113  0.399*
   12  R2  #      80    233    233     199   0.85    113  0.399*
-------------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.13    0.16     8.0   0.53    31.3  1.65     37.4     1.2     32.3
    8  T1   0.13    0.15     8.0   0.53    30.8  1.63     36.8     1.1     32.4
   18  R2   0.09    0.11     8.0   0.53    22.7  1.31     27.1     0.9     31.6
-------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.12    0.15     7.1   0.28    17.8  1.40     40.7     1.3     31.4
    6  T1   0.49    0.59     6.8   0.28    71.7  6.32    163.5     4.8     33.7
   16  R2   0.16    0.19     6.7   0.28    23.3  2.29     53.2     1.6     32.8
```

North: Dorsey Avenue										
7	L2	0.25	0.30	8.5	0.46	47.9	2.77	66.4	2.1	32.0
4	T1	0.15	0.18	8.5	0.46	29.3	1.92	40.6	1.3	32.0
14	R2	0.21	0.25	8.6	0.46	39.6	2.99	54.8	1.8	31.2
West: Greenbag Road										
5	L2	0.21	0.25	8.3	0.34	31.0	2.37	59.1	1.9	30.9
2	T1	0.71	0.86	7.8	0.33	108.3	8.25	206.8	6.2	33.2
12	R2	0.17	0.21	7.9	0.33	26.2	3.34	50.1	1.6	32.2

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	16.14	1.0	8.6	0.01	0.001	0.003
8	T1	15.86	1.0	8.5	0.01	0.001	0.003
18	R2	11.87	1.1	9.6	0.01	0.001	0.003
		43.87	3.0	26.7	0.03	0.003	0.009
East: Greenbag Road							
1	L2	21.27	2.6	23.2	0.03	0.002	0.011
6	T1	60.23	3.2	28.5	0.03	0.003	0.011
16	R2	19.60	1.0	9.3	0.01	0.001	0.003
		101.11	6.9	61.0	0.07	0.006	0.026
North: Dorsey Avenue							
7	L2	37.03	4.2	37.6	0.05	0.004	0.029
4	T1	22.95	3.2	28.5	0.04	0.003	0.022
14	R2	30.20	2.7	24.3	0.03	0.003	0.022
		90.18	10.1	90.4	0.11	0.009	0.073
West: Greenbag Road							
5	L2	33.18	2.6	23.4	0.03	0.002	0.037
2	T1	108.11	13.1	116.9	0.14	0.011	0.140
12	R2	26.63	4.1	36.5	0.04	0.004	0.053
		167.92	19.8	176.8	0.21	0.017	0.230
INTERSECTION:		403.08	39.8	354.9	0.43	0.036	0.338

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.27	38.5	143.4	0.16	0.014	0.044
8	T1	0.27	38.5	143.4	0.16	0.014	0.044
18	R2	0.27	25.1	220.0	0.29	0.021	0.079
		0.27	33.7	163.9	0.19	0.016	0.053
East: Greenbag Road							
1	L2	0.32	15.6	353.8	0.45	0.037	0.174
6	T1	0.23	51.0	108.4	0.12	0.011	0.043
16	R2	0.23	51.1	108.2	0.12	0.011	0.040
		0.24	37.6	147.2	0.17	0.015	0.063
North: Dorsey Avenue							
7	L2	0.35	15.7	351.4	0.44	0.036	0.274
4	T1	0.35	12.7	435.4	0.55	0.046	0.334
14	R2	0.34	20.1	275.6	0.32	0.030	0.249
		0.35	16.0	346.8	0.43	0.036	0.281
West: Greenbag Road							
5	L2	0.35	22.6	245.6	0.27	0.025	0.384
2	T1	0.32	15.8	351.2	0.43	0.034	0.422
12	R2	0.33	12.3	453.2	0.54	0.045	0.663
		0.33	16.0	347.6	0.42	0.034	0.453
INTERSECTION:		0.30	21.0	263.5	0.32	0.027	0.251

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	160	691	0.232	8.0	0.53	1.0	25.5	1600.0
East: Greenbag Road								
1	63	612	0.103	7.1	0.28	0.4	9.8	1600.0
2	345	1046	0.330	6.8	0.28	1.7	41.9	1600.0
North: Dorsey Avenue								
1	256	780	0.328	8.5	0.46	1.5	37.2	1600.0
West: Greenbag Road								
1	92	576	0.160	8.3	0.34	0.6	16.3	1600.0
2	408	1023	0.399	7.8	0.33	2.2	55.4	1600.0

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	160	150	691	0.232	100
East: Greenbag Road					
1	63	63	612	0.103	100
2	345	150	1046	0.330	100
North: Dorsey Avenue					
1	256	150	780	0.328	100
West: Greenbag Road					
1	92	92	576	0.160	100
2	408	150	1023	0.399	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	160	0		0.232	8.0	26	1600
	160	0		0.232	8.0	26	
East: Greenbag Road							
1	63	0		0.103	7.1	10	1600
2	345	1		0.330	6.8	42	1600
	408	1		0.330	6.8	42	
North: Dorsey Avenue							
1	256	1		0.328	8.5	37	1600
	256	1		0.328	8.5	37	
West: Greenbag Road							
1	92	3		0.160	8.3	16	1600
2	408	1		0.399	7.8	55	1600
	500	2		0.399	7.9	55	
ALL VEHICLES							
	Total Flow 1324	% HV 1		Max X 0.399	Aver. Delay 7.7	Max Queue 55	

```
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout

-----------------------------------------------------
                                        Average  Driver
 Lane    Satn    Satn    Satn    Satn     Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       18.5   1142    3.15    85.75    25.00    2.23
-----------------------------------------------------
 East: Greenbag Road
 1       14.8    807    4.46    97.01    25.00    3.31
 2       21.0   1264    2.85    87.62    25.15    2.03
-----------------------------------------------------
 North: Dorsey Avenue
 1       18.0   1111    3.24    85.63    25.20    2.29
-----------------------------------------------------
 West: Greenbag Road
 1       14.8    786    4.58    99.56    25.60    3.40
 2       21.2   1262    2.85    88.63    25.24    2.04
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.232    NA      NA     5.2   6.4   1.6   8.0   4.7   5.3   0.0   5.3   0.0    8.0
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.103    NA      NA     5.9   6.4   0.7   7.1   4.6   5.3   0.0   5.3   0.0    7.1
 2      0.330    NA      NA     3.4   5.1   1.7   6.8   5.8   4.5   0.0   4.5   0.0    6.8
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.328    NA      NA     4.6   6.3   2.2   8.5   4.5   6.2   0.0   6.2   0.0    8.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.160    NA      NA     6.3   7.1   1.2   8.3   4.6   6.3   0.0   6.3   0.0    8.3
 2      0.399    NA      NA     3.5   5.5   2.3   7.8   5.9   5.2   0.0   5.2   0.0    7.8
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.232   NA      NA     0.0    0.4   0.0    0.4    1.0  0.01   0.02    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.232	NA	NA	0.0	10.3	0.0	10.3	25.5	0.01	0.02	0.0	NA
East: Greenbag Road												
1	0.103	NA	NA	0.0	4.0	0.0	4.0	9.8	0.00	0.01	0.0	NA
2	0.330	NA	NA	0.0	16.9	0.0	16.9	41.9	0.01	0.03	0.0	NA
North: Dorsey Avenue												
1	0.328	NA	NA	0.0	15.0	0.0	15.0	37.2	0.01	0.02	0.0	NA
West: Greenbag Road												
1	0.160	NA	NA	0.0	6.6	0.0	6.6	16.3	0.00	0.01	0.0	NA
2	0.399	NA	NA	0.0	22.3	0.0	22.3	55.4	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.232	NA	NA	0.0	0.4	0.6
East: Greenbag Road						
1	0.103	NA	NA	0.0	0.1	0.2
2	0.330	NA	NA	0.0	0.6	1.2
North: Dorsey Avenue						
1	0.328	NA	NA	0.0	0.6	1.1
West: Greenbag Road						
1	0.160	NA	NA	0.0	0.2	0.4
2	0.399	NA	NA	0.0	0.9	1.6

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.232	NA	NA	0.0	8.9	16.1
East: Greenbag Road						
1	0.103	NA	NA	0.0	3.1	5.7
2	0.330	NA	NA	0.0	16.3	29.6
North: Dorsey Avenue						
1	0.328	NA	NA	0.0	15.3	27.7
West: Greenbag Road						
1	0.160	NA	NA	0.0	5.4	9.8
2	0.399	NA	NA	0.0	22.4	40.7

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.232	0.4	0.5	0.7	0.9	1.0	1.1	1.2
East: Greenbag Road								
1	0.103	0.2	0.2	0.3	0.3	0.4	0.4	0.5
2	0.330	0.7	0.9	1.2	1.4	1.7	1.8	2.0
North: Dorsey Avenue								
1	0.328	0.6	0.8	1.1	1.3	1.5	1.6	1.8
West: Greenbag Road								
1	0.160	0.3	0.3	0.5	0.5	0.6	0.7	0.8
2	0.399	0.9	1.1	1.6	1.9	2.2	2.4	2.6

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.232	10.3	13.3	18.7	21.7	25.5	28.3	30.4
East: Greenbag Road								
1	0.103	4.0	5.1	7.2	8.4	9.8	10.9	11.7
2	0.330	16.8	21.8	30.8	35.6	41.9	46.5	50.0
North: Dorsey Avenue								
1	0.328	15.0	19.4	27.3	31.7	37.2	41.3	44.4
West: Greenbag Road								
1	0.160	6.6	8.5	12.0	13.9	16.3	18.1	19.5
2	0.399	22.3	28.9	40.7	47.1	55.4	61.5	66.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.232	NA	NA	0.53	0.00	0.00	0.53	84.8	0.00	0.0	0.57	0.57
East: Greenbag Road												
1	0.103	NA	NA	0.28	0.00	0.00	0.28	17.8	0.00	0.0	0.38	0.38
2	0.330	NA	NA	0.28	0.00	0.00	0.28	95.1	0.00	0.0	0.40	0.40
North: Dorsey Avenue												
1	0.328	NA	NA	0.46	0.00	0.00	0.46	116.8	0.00	0.0	0.51	0.51
West: Greenbag Road												
1	0.160	NA	NA	0.34	0.00	0.00	0.34	31.0	0.00	0.0	0.43	0.43
2	0.399	NA	NA	0.33	0.00	0.00	0.33	134.6	0.00	0.0	0.45	0.45

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	59.2	58.2	42.9	160.2
%HV (all designations)	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	63.3	260.2	84.7	408.2
%HV (all designations)	0.0	1.0	0.0	0.6

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	105.1	64.3	86.7	256.1
%HV (all designations)	0.0	0.0	3.0	1.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	91.8	328.6	79.6	500.0
%HV (all designations)	3.0	1.0	2.0	1.5

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	59.2	58.2	42.9	160.2
Mov Class %	100.0	100.0	100.0	100.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	63.3	257.6	84.7	405.6
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	105.1	64.3	84.1	253.5
Mov Class %	100.0	100.0	97.0	99.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	89.1	325.3	78.0	492.4
Mov Class %	97.0	99.0	98.0	98.5
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	0.0	0.0
Mov Class %	0.0	0.0	0.0	0.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	2.6	0.0	2.6
Mov Class %	0.0	1.0	0.0	0.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	2.6	2.6

Mov Class %	0.0	0.0	3.0	1.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	2.8	3.3	1.6	7.6
Mov Class %	3.0	1.0	2.0	1.5
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.98	0.98	0.98	-
Residual Demand	0.0	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

Site ID: SAT
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	59.2	58.2	42.9	160.2
Total	59.2	58.2	42.9	160.2
Approach	59.2	58.2	42.9	160.2

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	63.3	*	*	63.3
Total	63.3	*	*	63.3
Lane 2				
LV	*	257.6	84.7	342.3
HV	*	2.6	*	2.6
Total	*	260.2	84.7	344.9
Approach	63.3	260.2	84.7	408.2

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	105.1	64.3	84.1	253.5
HV	*	*	2.6	2.6
Total	105.1	64.3	86.7	256.1
Approach	105.1	64.3	86.7	256.1

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Lane 1				
LV	89.1	*	*	89.1
HV	2.8	*	*	2.8
Total	91.8	*	*	91.8
Lane 2				
LV	*	325.3	78.0	403.3
HV	*	3.3	1.6	4.9
Total	*	328.6	79.6	408.2
Approach	91.8	328.6	79.6	500.0

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT
Exit: SOUTH			
Lane: 1	205.6	1.6	207.1
Total	205.6	1.6	207.1
Exit: EAST			
Lane: 1	473.2	3.3	476.5
Total	473.2	3.3	476.5
Exit: NORTH			
Lane: 1	231.9	2.8	234.7
Total	231.9	2.8	234.7
Exit: WEST			
Lane: 1	400.9	5.2	406.1

```
Total              400.9     5.2   406.1
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           205.6     1.6   207.1
Total              205.6     1.6   207.1
-----------------------------------------
 Exit: EAST
Lane:  1           473.2     3.3   476.5
Total              473.2     3.3   476.5
-----------------------------------------
 Exit: NORTH
Lane:  1           231.9     2.8   234.7
Total              231.9     2.8   234.7
-----------------------------------------
 Exit: WEST
Lane:  1           400.9     5.2   406.1
Total              400.9     5.2   406.1
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - SAT Peak

```
Site ID: SAT
Roundabout


Lane Flow-Capacity Iterations:

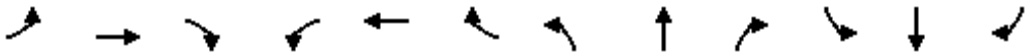
  Site Model Variability Index (Iterations 3 to N):   1.3%
  Number of Iterations: 5 (Maximum: 10)
  Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations:
     2.0%   1.2%   0.6%

Other Diagnostic Messages (if any):
```

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SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Friday, January 25, 2019 8:39:45 AM
Project: O:\Clients\WVDOH\Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-01 Submission\2B - Greenbag & Dorsey-Kingwood With Termination of Luckey Lane\Roundabout\Greenbag & Dorsey Roundabout SIDRA - Two Lane.sip8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	134	191	201	177	141	26	155
Future Volume (vph)	69	368	35	31	476	134	191	201	177	141	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.967			0.930			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1628	0	1678	1701	0	1788	1750	0	1684	1411	0
Flt Permitted	0.113			0.368			0.438			0.211		
Satd. Flow (perm)	186	1628	0	650	1701	0	824	1750	0	374	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			17			41			168	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	146	208	218	192	153	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	663	0	208	410	0	153	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

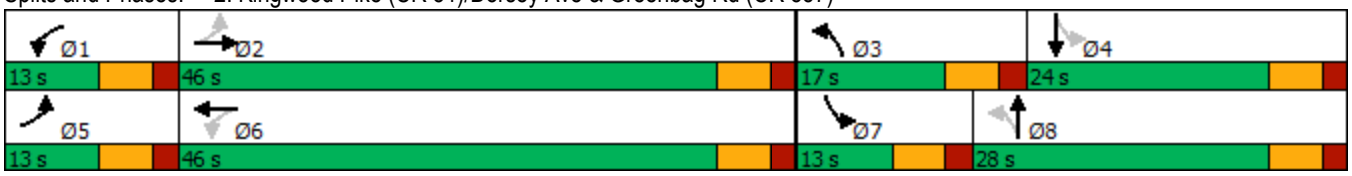


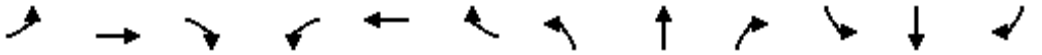
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	13.0	46.0		13.0	46.0		17.0	28.0		13.0	24.0	
Total Split (%)	13.0%	46.0%		13.0%	46.0%		17.0%	28.0%		13.0%	24.0%	
Maximum Green (s)	7.0	40.0		7.0	40.0		11.0	22.0		7.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	44.9	40.9		43.3	38.3		32.6	22.2		26.0	18.9	
Actuated g/C Ratio	0.47	0.43		0.45	0.40		0.34	0.23		0.27	0.20	
v/c Ratio	0.41	0.63		0.09	0.96		0.54	0.94		0.77	0.47	
Control Delay	18.8	27.0		12.2	55.0		29.3	65.5		52.6	12.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.8	27.0		12.2	55.0		29.3	65.5		52.6	12.8	
LOS	B	C		B	E		C	E		D	B	
Approach Delay		25.8			52.9			53.3			30.3	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	22	219		10	396		96	239		69	15	
Queue Length 95th (ft)	45	335		25	#637		157	#436		#160	80	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	189	734		372	727		398	437		198	413	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.40	0.60		0.09	0.91		0.52	0.94		0.77	0.47	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 95.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 43.0 Intersection LOS: D
Intersection Capacity Utilization 86.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

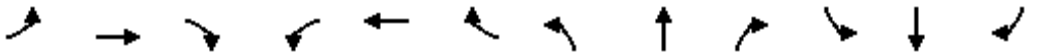




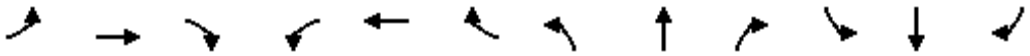
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	134	191	201	177	141	26	155
Future Volume (veh/h)	69	368	35	31	476	134	191	201	177	141	26	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1706	1706	1843	1828	1820	1919	1947	1947	1966	1834	1676	1834
Adj Flow Rate, veh/h	75	400	38	34	517	146	208	218	192	153	28	168
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	173	635	60	322	546	154	363	220	194	206	41	243
Arrive On Green	0.05	0.41	0.41	0.03	0.40	0.40	0.11	0.23	0.23	0.07	0.19	0.19
Sat Flow, veh/h	1625	1534	146	1741	1366	386	1854	956	842	1746	208	1247
Grp Volume(v), veh/h	75	0	438	34	0	663	208	0	410	153	0	196
Grp Sat Flow(s),veh/h/ln	1625	0	1680	1741	0	1752	1854	0	1798	1746	0	1455
Q Serve(g_s), s	2.6	0.0	19.7	1.1	0.0	34.9	8.4	0.0	21.7	6.7	0.0	12.0
Cycle Q Clear(g_c), s	2.6	0.0	19.7	1.1	0.0	34.9	8.4	0.0	21.7	6.7	0.0	12.0
Prop In Lane	1.00		0.09	1.00		0.22	1.00		0.47	1.00		0.86
Lane Grp Cap(c), veh/h	173	0	695	322	0	700	363	0	414	206	0	284
V/C Ratio(X)	0.43	0.00	0.63	0.11	0.00	0.95	0.57	0.00	0.99	0.74	0.00	0.69
Avail Cap(c_a), veh/h	219	0	704	396	0	734	375	0	414	206	0	284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	0.0	22.2	17.6	0.0	27.7	27.0	0.0	36.6	29.8	0.0	35.8
Incr Delay (d2), s/veh	1.7	0.0	1.8	0.1	0.0	20.8	2.0	0.0	41.3	13.3	0.0	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	9.5	0.5	0.0	20.8	4.5	0.0	15.5	4.0	0.0	5.3
LnGrp Delay(d),s/veh	24.2	0.0	24.0	17.8	0.0	48.5	29.0	0.0	78.0	43.2	0.0	42.7
LnGrp LOS	C		C	B		D	C		E	D		D
Approach Vol, veh/h		513			697			618			349	
Approach Delay, s/veh		24.0			47.0			61.5			42.9	
Approach LOS		C			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	45.5	16.4	24.6	10.3	44.2	13.0	28.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	40.0	11.0	18.0	7.0	40.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	3.1	21.7	10.4	14.0	4.6	36.9	8.7	23.7
Green Ext Time (p_c), s	0.0	2.4	0.0	0.4	0.0	1.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	45.0
HCM 2010 LOS	D



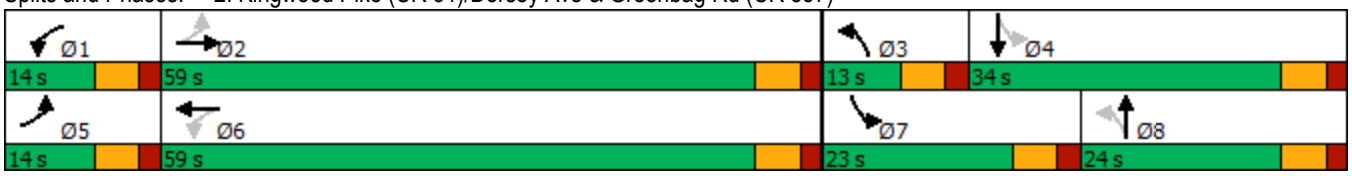
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	192	70	78	67	203	212	144
Future Volume (vph)	146	520	148	117	419	192	70	78	67	203	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.953			0.931			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1709	0	1762	1756	0	1736	1726	0	1667	1651	0
Flt Permitted	0.136			0.083			0.251			0.384		
Satd. Flow (perm)	242	1709	0	154	1756	0	459	1726	0	674	1651	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			25			30			27	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	216	79	88	75	228	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	687	0	79	163	0	228	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	14.0	59.0		14.0	59.0		13.0	24.0		23.0	34.0	
Total Split (%)	11.7%	49.2%		11.7%	49.2%		10.8%	20.0%		19.2%	28.3%	
Maximum Green (s)	8.0	53.0		8.0	53.0		7.0	18.0		17.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	60.0	52.0		59.6	51.8		23.5	16.7		38.2	28.1	
Actuated g/C Ratio	0.52	0.45		0.51	0.45		0.20	0.14		0.33	0.24	
v/c Ratio	0.73	0.97		0.70	0.86		0.47	0.60		0.65	0.95	
Control Delay	34.3	57.9		39.7	41.2		38.1	48.0		39.6	75.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.3	57.9		39.7	41.2		38.1	48.0		39.6	75.7	
LOS	C	E		D	D		D	D		D	E	
Approach Delay		53.7			41.0			44.8			62.6	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	59	554		46	459		42	97		134	293	
Queue Length 95th (ft)	#134	#811		#130	#676		78	167		204	#490	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	225	792		190	818		171	299		367	420	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.73	0.95		0.69	0.84		0.46	0.55		0.62	0.95	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 116.1			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 51.0		Intersection LOS: D	
Intersection Capacity Utilization 87.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

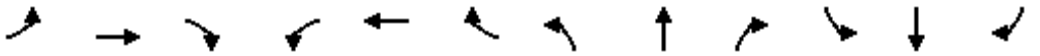
Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



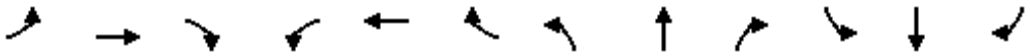
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	192	70	78	67	203	212	144
Future Volume (veh/h)	146	520	148	117	419	192	70	78	67	203	212	144
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1843	1829	1843	1919	1906	1919	1891	1918	1966	1815	1819	1834
Adj Flow Rate, veh/h	164	584	166	131	471	216	79	88	75	228	238	162
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	4	3	3	1	0	0
Cap, veh/h	244	608	173	188	534	245	160	161	137	376	245	167
Arrive On Green	0.07	0.44	0.44	0.06	0.43	0.43	0.05	0.17	0.17	0.12	0.24	0.24
Sat Flow, veh/h	1755	1370	390	1828	1238	568	1801	958	816	1729	1010	687
Grp Volume(v), veh/h	164	0	750	131	0	687	79	0	163	228	0	400
Grp Sat Flow(s),veh/h/ln	1755	0	1760	1828	0	1806	1801	0	1774	1729	0	1697
Q Serve(g_s), s	5.9	0.0	47.6	4.6	0.0	40.3	4.1	0.0	9.7	12.1	0.0	26.9
Cycle Q Clear(g_c), s	5.9	0.0	47.6	4.6	0.0	40.3	4.1	0.0	9.7	12.1	0.0	26.9
Prop In Lane	1.00		0.22	1.00		0.31	1.00		0.46	1.00		0.41
Lane Grp Cap(c), veh/h	244	0	781	188	0	779	160	0	298	376	0	412
V/C Ratio(X)	0.67	0.00	0.96	0.70	0.00	0.88	0.49	0.00	0.55	0.61	0.00	0.97
Avail Cap(c_a), veh/h	246	0	809	212	0	830	181	0	298	417	0	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	31.1	26.7	0.0	30.1	38.5	0.0	44.0	32.5	0.0	43.3
Incr Delay (d2), s/veh	6.9	0.0	22.1	8.4	0.0	10.5	2.3	0.0	2.1	2.1	0.0	36.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	27.9	2.7	0.0	22.3	2.1	0.0	4.9	6.0	0.0	16.9
LnGrp Delay(d),s/veh	31.8	0.0	53.2	35.1	0.0	40.5	40.9	0.0	46.1	34.6	0.0	79.9
LnGrp LOS	C		D	D		D	D		D	C		E
Approach Vol, veh/h		914			818			242			628	
Approach Delay, s/veh		49.3			39.7			44.4			63.5	
Approach LOS		D			D			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	57.2	11.7	34.0	13.9	55.8	20.3	25.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	53.0	7.0	28.0	8.0	53.0	17.0	18.0
Max Q Clear Time (g_c+I1), s	6.6	49.6	6.1	28.9	7.9	42.3	14.1	11.7
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.0	3.4	0.2	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	49.2
HCM 2010 LOS	D



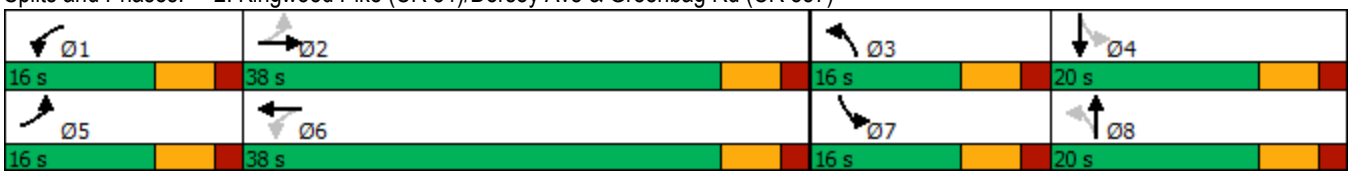
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	322	78	62	255	83	58	57	42	103	63	84
Future Volume (vph)	90	322	78	62	255	83	58	57	42	103	63	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.963			0.936			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1643	1709	0	1762	1773	0	1806	1779	0	1684	1593	0
Flt Permitted	0.426			0.441			0.662			0.531		
Satd. Flow (perm)	737	1709	0	818	1773	0	1258	1779	0	941	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			20			35			64	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	3%
Adj. Flow (vph)	92	329	80	63	260	85	59	58	43	105	64	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	409	0	63	345	0	59	101	0	105	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		16.0	16.0		16.0	16.0	
Total Split (s)	16.0	38.0		16.0	38.0		16.0	20.0		16.0	20.0	
Total Split (%)	17.8%	42.2%		17.8%	42.2%		17.8%	22.2%		17.8%	22.2%	
Maximum Green (s)	10.0	32.0		10.0	32.0		10.0	14.0		10.0	14.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	33.6	31.8		30.9	28.3		14.4	9.0		17.8	12.7	
Actuated g/C Ratio	0.52	0.49		0.48	0.44		0.22	0.14		0.28	0.20	
v/c Ratio	0.18	0.48		0.13	0.44		0.17	0.36		0.29	0.41	
Control Delay	11.1	21.3		10.8	22.1		19.7	26.0		20.9	22.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.1	21.3		10.8	22.1		19.7	26.0		20.9	22.6	
LOS	B	C		B	C		B	C		C	C	
Approach Delay		19.4			20.3			23.7			21.9	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	20	149		13	118		17	26		31	33	
Queue Length 95th (ft)	48	282		35	229		50	78		79	102	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	551	956		584	994		451	471		419	480	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.43		0.11	0.35		0.13	0.21		0.25	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 64.7			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



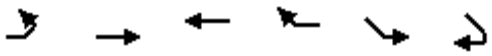
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	322	78	62	255	83	58	57	42	103	63	84
Future Volume (veh/h)	90	322	78	62	255	83	58	57	42	103	63	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1789	1821	1843	1919	1905	1919	1966	1966	1966	1834	1802	1834
Adj Flow Rate, veh/h	92	329	80	63	260	85	59	58	43	105	64	86
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	1	1	0	1	1	0	0	0	0	0	0
Cap, veh/h	371	418	102	324	387	127	300	119	88	346	93	125
Arrive On Green	0.07	0.29	0.29	0.06	0.28	0.28	0.06	0.11	0.11	0.07	0.13	0.13
Sat Flow, veh/h	1704	1416	344	1828	1376	450	1873	1050	779	1746	698	938
Grp Volume(v), veh/h	92	0	409	63	0	345	59	0	101	105	0	150
Grp Sat Flow(s),veh/h/ln	1704	0	1760	1828	0	1825	1873	0	1829	1746	0	1637
Q Serve(g_s), s	1.9	0.0	11.1	1.2	0.0	8.7	1.4	0.0	2.7	2.7	0.0	4.6
Cycle Q Clear(g_c), s	1.9	0.0	11.1	1.2	0.0	8.7	1.4	0.0	2.7	2.7	0.0	4.6
Prop In Lane	1.00		0.20	1.00		0.25	1.00		0.43	1.00		0.57
Lane Grp Cap(c), veh/h	371	0	519	324	0	514	300	0	206	346	0	217
V/C Ratio(X)	0.25	0.00	0.79	0.19	0.00	0.67	0.20	0.00	0.49	0.30	0.00	0.69
Avail Cap(c_a), veh/h	578	0	1080	570	0	1120	556	0	491	550	0	439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	16.9	12.9	0.0	16.6	18.8	0.0	21.7	18.4	0.0	21.6
Incr Delay (d2), s/veh	0.3	0.0	2.7	0.3	0.0	1.5	0.3	0.0	1.8	0.5	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.7	0.6	0.0	4.6	0.7	0.0	1.4	1.3	0.0	2.3
LnGrp Delay(d),s/veh	12.7	0.0	19.6	13.2	0.0	18.1	19.1	0.0	23.5	18.9	0.0	25.5
LnGrp LOS	B		B	B		B	B		C	B		C
Approach Vol, veh/h		501			408			160			255	
Approach Delay, s/veh		18.3			17.4			21.9			22.8	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	21.4	8.9	12.9	9.7	20.7	9.9	11.9
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	32.0	10.0	14.0	10.0	32.0	10.0	14.0
Max Q Clear Time (g_c+I1), s	3.2	13.1	3.4	6.6	3.9	10.7	4.7	4.7
Green Ext Time (p_c), s	0.1	2.2	0.0	0.4	0.1	1.9	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & LUCKEY LANE



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	553	526	121	59	0
Future Volume (vph)	0	553	526	121	59	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			
Flt Protected					0.950	
Satd. Flow (prot)	0	1606	1566	0	1386	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1606	1566	0	1386	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	8%	5%	1%	0%	0%
Adj. Flow (vph)	0	658	626	144	70	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	658	770	0	70	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

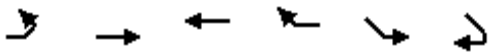
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	553	526	121	59	0
Future Vol, veh/h	0	553	526	121	59	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	8	5	1	0	0
Mvmt Flow	0	658	626	144	70	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	770	0	-	0	1356	698
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	658	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	854	-	-	-	143	427
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	854	-	-	-	143	427
Mov Cap-2 Maneuver	-	-	-	-	143	-
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	52.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	854	-	-	-	143
HCM Lane V/C Ratio	-	-	-	-	0.491
HCM Control Delay (s)	0	-	-	-	52.3
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	2.3



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	570	563	171	74	3
Future Volume (vph)	0	570	563	171	74	3
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969		0.995	
Flt Protected					0.954	
Satd. Flow (prot)	0	1734	1610	0	1385	0
Flt Permitted					0.954	
Satd. Flow (perm)	0	1734	1610	0	1385	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	0	588	580	176	76	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	588	756	0	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

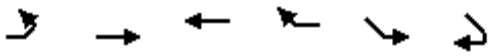
Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	570	563	171	74	3
Future Vol, veh/h	0	570	563	171	74	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	0	0	0
Mvmt Flow	0	588	580	176	76	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1256	668
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	588	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	864	-	-	-	166	445
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	524	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	864	-	-	-	166	445
Mov Cap-2 Maneuver	-	-	-	-	166	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	524	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	43.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	864	-	-	-	170
HCM Lane V/C Ratio	-	-	-	-	0.467
HCM Control Delay (s)	0	-	-	-	43.5
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	2.2



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	0	391	340	62	59	1
Future Volume (vph)	0	391	340	62	59	1
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	8	8
Grade (%)		-4%	3%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.979		0.998	
Flt Protected					0.953	
Satd. Flow (prot)	0	1717	1639	0	1387	0
Flt Permitted					0.953	
Satd. Flow (perm)	0	1717	1639	0	1387	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1223	148		747	
Travel Time (s)		20.8	2.5		20.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	0	430	374	68	65	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	430	442	0	66	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		8	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.39	1.39
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	0	391	340	62	59	1
Future Vol, veh/h	0	391	340	62	59	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	2	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	0	0	0
Mvmt Flow	0	430	374	68	65	1

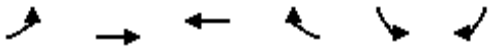
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	442	0	-	0	838	408
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	430	-
Critical Hdwy	4.1	-	-	-	6.8	6.4
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1129	-	-	-	309	633
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1129	-	-	-	309	633
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	629	-

Approach	EB	WB	SE
HCM Control Delay, s	0	0	19.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SELn1
Capacity (veh/h)	1129	-	-	-	312
HCM Lane V/C Ratio	-	-	-	-	0.211
HCM Control Delay (s)	0	-	-	-	19.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & RICHARD AVENUE



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	532	562	69	46	85
Future Volume (vph)	80	532	562	69	46	85
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.912	
Flt Protected		0.994			0.983	
Satd. Flow (prot)	0	1602	1559	0	1488	0
Flt Permitted		0.994			0.983	
Satd. Flow (perm)	0	1602	1559	0	1488	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	25%	5%	5%	12%	0%	0%
Adj. Flow (vph)	93	619	653	80	53	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	712	733	0	152	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

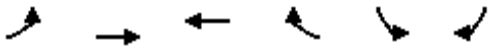
Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	532	562	69	46	85
Future Vol, veh/h	80	532	562	69	46	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	25	5	5	12	0	0
Mvmt Flow	93	619	653	80	53	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	733	0	-	0	1498	693
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	805	-
Critical Hdwy	4.35	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.425	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	776	-	-	-	161	464
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	776	-	-	-	132	464
Mov Cap-2 Maneuver	-	-	-	-	132	-
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	485	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	40.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	776	-	-	-	246
HCM Lane V/C Ratio	0.12	-	-	-	0.619
HCM Control Delay (s)	10.3	0	-	-	40.8
HCM Lane LOS	B	A	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	-	3.7



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	627	704	13	26	31
Future Volume (vph)	18	627	704	13	26	31
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.998		0.927	
Flt Protected		0.999			0.978	
Satd. Flow (prot)	0	1732	1652	0	1505	0
Flt Permitted		0.999			0.978	
Satd. Flow (perm)	0	1732	1652	0	1505	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	1%	10%	0%	0%
Adj. Flow (vph)	18	640	718	13	27	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	658	731	0	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

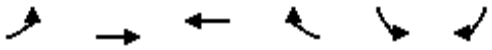
Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	627	704	13	26	31
Future Vol, veh/h	18	627	704	13	26	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	10	0	0
Mvmt Flow	18	640	718	13	27	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	731	0	-	0	1401	725
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	883	-	-	-	182	446
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	883	-	-	-	176	446
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	22.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	883	-	-	-	262
HCM Lane V/C Ratio	0.021	-	-	-	0.222
HCM Control Delay (s)	9.2	0	-	-	22.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	441	392	13	9	9
Future Volume (vph)	7	441	392	13	9	9
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.932	
Flt Protected		0.999			0.976	
Satd. Flow (prot)	0	1715	1663	0	1510	0
Flt Permitted		0.999			0.976	
Satd. Flow (perm)	0	1715	1663	0	1510	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		148	1216		320	
Travel Time (s)		2.5	20.7		8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	10%	0%	0%
Adj. Flow (vph)	8	479	426	14	10	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	487	440	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.18	1.18	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

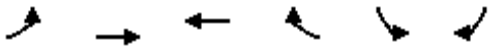
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	441	392	13	9	9
Future Vol, veh/h	7	441	392	13	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	10	0	0
Mvmt Flow	8	479	426	14	10	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	928	433
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	495	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1131	-	-	-	333	642
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1131	-	-	-	330	642
Mov Cap-2 Maneuver	-	-	-	-	330	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1131	-	-	-	436
HCM Lane V/C Ratio	0.007	-	-	-	0.045
HCM Control Delay (s)	8.2	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	80	529	556	75	49	85
Future Volume (vph)	80	529	556	75	49	85
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Storage Length (ft)	150			125	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.914	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1230	1541	1488	1186	1490	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1230	1541	1488	1186	1490	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1343	1216		320	
Travel Time (s)		22.9	20.7		8.7	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	25%	5%	5%	12%	0%	0%
Adj. Flow (vph)	93	615	647	87	57	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	93	615	647	87	156	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

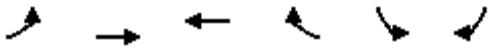
Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	529	556	75	49	85
Future Vol, veh/h	80	529	556	75	49	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	125	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	25	5	5	12	0	0
Mvmt Flow	93	615	647	87	57	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	734	0	-	0	1448	647
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	801	-
Critical Hdwy	4.35	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.425	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	775	-	-	-	172	492
Stage 1	-	-	-	-	564	-
Stage 2	-	-	-	-	487	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	775	-	-	-	151	492
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	487	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	35.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	775	-	-	-	269
HCM Lane V/C Ratio	0.12	-	-	-	0.579
HCM Control Delay (s)	10.3	-	-	-	35.3
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0.4	-	-	-	3.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	18	623	695	22	30	31
Future Volume (vph)	18	623	695	22	30	31
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Storage Length (ft)	150			125	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.931	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1537	1618	1547	1208	1508	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1537	1618	1547	1208	1508	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1345	1216		320	
Travel Time (s)		22.9	20.7		8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	1%	10%	0%	0%
Adj. Flow (vph)	18	636	709	22	31	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	636	709	22	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.5%		ICU Level of Service A	
Analysis Period (min) 15			

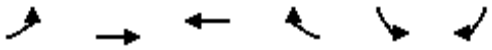
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	623	695	22	30	31
Future Vol, veh/h	18	623	695	22	30	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	125	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	0	1	10	0	0
Mvmt Flow	18	636	709	22	31	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	731	0	-	0	1381	709
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	672	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	883	-	-	-	187	455
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	551	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	883	-	-	-	183	455
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	551	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	883	-	-	-	263
HCM Lane V/C Ratio	0.021	-	-	-	0.237
HCM Control Delay (s)	9.2	-	-	-	22.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	438	389	16	12	9
Future Volume (vph)	9	438	389	16	12	9
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	10	11	11
Grade (%)		-4%	3%		-2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.941	
Flt Protected	0.950				0.973	
Satd. Flow (prot)	1537	1602	1563	1208	1520	0
Flt Permitted	0.950				0.973	
Satd. Flow (perm)	1537	1602	1563	1208	1520	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1353	1216		320	
Travel Time (s)		23.1	20.7		8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	10%	0%	0%
Adj. Flow (vph)	10	476	423	17	13	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	476	423	17	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		21	21		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.23	1.23	1.28	1.28	1.19	1.19
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	438	389	16	12	9
Future Vol, veh/h	9	438	389	16	12	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-4	3	-	-2	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	10	0	0
Mvmt Flow	10	476	423	17	13	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	919	423
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	4.1	-	-	-	6	6
Critical Hdwy Stg 1	-	-	-	-	5	-
Critical Hdwy Stg 2	-	-	-	-	5	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1131	-	-	-	336	650
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1131	-	-	-	333	650
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1131	-	-	-	421
HCM Lane V/C Ratio	0.009	-	-	-	0.054
HCM Control Delay (s)	8.2	-	-	-	14
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & LOWER AARONS CREEK ROAD



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	599	4	5	538	23	22
Future Volume (vph)	599	4	5	538	23	22
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt	0.999				0.934	
Flt Protected			0.950		0.975	
Satd. Flow (prot)	1525	0	1483	1516	1414	0
Flt Permitted			0.950		0.975	
Satd. Flow (perm)	1525	0	1483	1516	1414	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	4%	0%	0%	3%	0%	0%
Adj. Flow (vph)	740	5	6	664	28	27
Shared Lane Traffic (%)			10%			
Lane Group Flow (vph)	745	0	5	665	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	599	4	5	538	23	22
Future Vol, veh/h	599	4	5	538	23	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	740	5	6	664	28	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	745	0	1419	743
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	872	-	193	445
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	192	445
Mov Cap-2 Maneuver	-	-	-	-	192	-
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	22.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	266	-	-	872	-
HCM Lane V/C Ratio	0.209	-	-	0.007	-
HCM Control Delay (s)	22.1	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	635	12	42	643	11	16
Future Volume (vph)	635	12	42	643	11	16
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.921	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	1551	0	1382	1595	1215	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	1551	0	1382	1595	1215	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	13%	3%	13%	17%
Adj. Flow (vph)	676	13	45	684	12	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	689	0	45	684	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	635	12	42	643	11	16
Future Vol, veh/h	635	12	42	643	11	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	13	3	13	17
Mvmt Flow	676	13	45	684	12	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	689	0	1457	683
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	774	-
Critical Hdwy	-	-	4.23	-	5.93	6.07
Critical Hdwy Stg 1	-	-	-	-	4.93	-
Critical Hdwy Stg 2	-	-	-	-	4.93	-
Follow-up Hdwy	-	-	2.317	-	3.617	3.453
Pot Cap-1 Maneuver	-	-	856	-	172	449
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	856	-	163	449
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	20.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	262	-	-	856	-
HCM Lane V/C Ratio	0.11	-	-	0.052	-
HCM Control Delay (s)	20.4	-	-	9.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	441	5	11	380	4	23
Future Volume (vph)	441	5	11	380	4	23
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	11	11	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.884	
Flt Protected			0.950		0.993	
Satd. Flow (prot)	1570	0	1561	1627	1363	0
Flt Permitted			0.950		0.993	
Satd. Flow (perm)	1570	0	1561	1627	1363	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	479	5	12	413	4	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	484	0	12	413	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	11			11	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.26	1.26	1.20	1.20	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	441	5	11	380	4	23
Future Vol, veh/h	441	5	11	380	4	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	479	5	12	413	4	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	919	482
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1089	-	354	613
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1089	-	350	613
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	552	-	-	1089	-
HCM Lane V/C Ratio	0.053	-	-	0.011	-
HCM Control Delay (s)	11.9	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	599	4	5	538	23	22
Future Volume (vph)	599	4	5	538	23	22
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.934	
Flt Protected					0.975	
Satd. Flow (prot)	1633	0	0	1651	1414	0
Flt Permitted					0.975	
Satd. Flow (perm)	1633	0	0	1651	1414	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	4%	0%	0%	3%	0%	0%
Adj. Flow (vph)	740	5	6	664	28	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	745	0	0	670	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.15	1.15	1.15	1.15	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	599	4	5	538	23	22
Future Vol, veh/h	599	4	5	538	23	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	3	0	0
Mvmt Flow	740	5	6	664	28	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	745	0	1419	743
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	872	-	193	445
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	191	445
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	22.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	265	-	-	872	-
HCM Lane V/C Ratio	0.21	-	-	0.007	-
HCM Control Delay (s)	22.2	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	635	12	42	643	11	16
Future Volume (vph)	635	12	42	643	11	16
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	11	12	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.921	
Flt Protected				0.997	0.980	
Satd. Flow (prot)	1662	0	0	1636	1215	0
Flt Permitted				0.997	0.980	
Satd. Flow (perm)	1662	0	0	1636	1215	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	13%	3%	13%	17%
Adj. Flow (vph)	676	13	45	684	12	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	689	0	0	729	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.15	1.15	1.20	1.15	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	635	12	42	643	11	16
Future Vol, veh/h	635	12	42	643	11	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	0	13	3	13	17
Mvmt Flow	676	13	45	684	12	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	689	0	1457	683
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	774	-
Critical Hdwy	-	-	4.23	-	5.93	6.07
Critical Hdwy Stg 1	-	-	-	-	4.93	-
Critical Hdwy Stg 2	-	-	-	-	4.93	-
Follow-up Hdwy	-	-	2.317	-	3.617	3.453
Pot Cap-1 Maneuver	-	-	856	-	172	449
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	856	-	157	449
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	20.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	255	-	-	856	-
HCM Lane V/C Ratio	0.113	-	-	0.052	-
HCM Control Delay (s)	20.9	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	441	5	11	380	4	23
Future Volume (vph)	441	5	11	380	4	23
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	12	12	12	12	9	9
Grade (%)	0%			0%	-3%	
Storage Length (ft)		0	75		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			75		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.884	
Flt Protected				0.999	0.993	
Satd. Flow (prot)	1682	0	0	1682	1363	0
Flt Permitted				0.999	0.993	
Satd. Flow (perm)	1682	0	0	1682	1363	0
Link Speed (mph)	40			40	35	
Link Distance (ft)	817			682	615	
Travel Time (s)	13.9			11.6	12.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	479	5	12	413	4	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	484	0	0	425	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	9	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.15	1.15	1.15	1.15	1.29	1.29
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

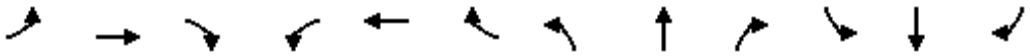
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	441	5	11	380	4	23
Future Vol, veh/h	441	5	11	380	4	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	479	5	12	413	4	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	484	0	919	482
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.1	-	5.8	5.9
Critical Hdwy Stg 1	-	-	-	-	4.8	-
Critical Hdwy Stg 2	-	-	-	-	4.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1089	-	354	613
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1089	-	349	613
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	669	-
Stage 2	-	-	-	-	705	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	551	-	-	1089	-
HCM Lane V/C Ratio	0.053	-	-	0.011	-
HCM Control Delay (s)	11.9	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	599	4	5	538	7	23	0	22	4	0	2
Future Volume (vph)	6	599	4	5	538	7	23	0	22	4	0	2
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	11	11	11	9	9	9	12	12	12
Grade (%)		0%			0%			-3%			0%	
Storage Length (ft)	0		0	75		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.998			0.934			0.961	
Flt Protected				0.950				0.975			0.966	
Satd. Flow (prot)	0	1525	0	1561	1592	0	0	1414	0	0	1547	0
Flt Permitted				0.950				0.975			0.966	
Satd. Flow (perm)	0	1525	0	1561	1592	0	0	1414	0	0	1547	0
Link Speed (mph)		40			40			35			25	
Link Distance (ft)		817			682			615			938	
Travel Time (s)		13.9			11.6			12.0			25.6	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	7	740	5	6	664	9	28	0	27	5	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	752	0	6	673	0	0	55	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.26	1.20	1.20	1.20	1.29	1.29	1.29	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.9%		ICU Level of Service A	
Analysis Period (min) 15			

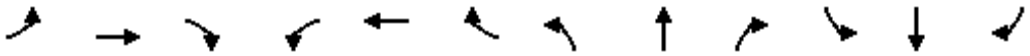
Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	599	4	5	538	7	23	0	22	4	0	2
Future Vol, veh/h	6	599	4	5	538	7	23	0	22	4	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	4	0	0	3	2	0	2	0	2	2	2
Mvmt Flow	7	740	5	6	664	9	28	0	27	5	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	673	0	0	745	0	0	1439	1442	743	1451	1440	669
Stage 1	-	-	-	-	-	-	757	757	-	681	681	-
Stage 2	-	-	-	-	-	-	682	685	-	770	759	-
Critical Hdwy	4.12	-	-	4.1	-	-	6.5	5.92	5.9	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.92	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.92	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.5	4.018	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	918	-	-	872	-	-	142	168	445	109	133	458
Stage 1	-	-	-	-	-	-	457	472	-	440	450	-
Stage 2	-	-	-	-	-	-	496	503	-	393	415	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	918	-	-	872	-	-	139	165	445	101	130	458
Mov Cap-2 Maneuver	-	-	-	-	-	-	139	165	-	101	130	-
Stage 1	-	-	-	-	-	-	451	466	-	434	447	-
Stage 2	-	-	-	-	-	-	490	499	-	364	410	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	28.3	33
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	209	918	-	-	872	-	-	136
HCM Lane V/C Ratio	0.266	0.008	-	-	0.007	-	-	0.054
HCM Control Delay (s)	28.3	9	0	-	9.2	-	-	33
HCM Lane LOS	D	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.2



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	635	12	42	643	7	11	0	16	5	0	6
Future Volume (vph)	6	635	12	42	643	7	11	0	16	5	0	6
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	11	11	11	9	9	9	12	12	12
Grade (%)		0%			0%			-3%			0%	
Storage Length (ft)	0		0	75		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.998			0.921			0.926	
Flt Protected				0.950				0.980			0.978	
Satd. Flow (prot)	0	1551	0	1382	1592	0	0	1215	0	0	1509	0
Flt Permitted				0.950				0.980			0.978	
Satd. Flow (perm)	0	1551	0	1382	1592	0	0	1215	0	0	1509	0
Link Speed (mph)		40			40			35			25	
Link Distance (ft)		817			682			615			938	
Travel Time (s)		13.9			11.6			12.0			25.6	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	0%	13%	3%	2%	13%	2%	17%	2%	2%	2%
Adj. Flow (vph)	6	676	13	45	684	7	12	0	17	5	0	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	695	0	45	691	0	0	29	0	0	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.26	1.20	1.20	1.20	1.29	1.29	1.29	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	6	635	12	42	643	7	11	0	16	5	0	6
Future Vol, veh/h	6	635	12	42	643	7	11	0	16	5	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	0	13	3	2	13	2	17	2	2	2
Mvmt Flow	6	676	13	45	684	7	12	0	17	5	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	691	0	0	689	0	0	1476	1476	683	1481	1479	688
Stage 1	-	-	-	-	-	-	695	695	-	778	778	-
Stage 2	-	-	-	-	-	-	781	781	-	703	701	-
Critical Hdwy	4.12	-	-	4.23	-	-	6.63	5.92	6.07	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.63	4.92	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.63	4.92	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.317	-	-	3.617	4.018	3.453	3.518	4.018	3.318
Pot Cap-1 Maneuver	904	-	-	856	-	-	126	161	449	103	126	446
Stage 1	-	-	-	-	-	-	466	498	-	389	407	-
Stage 2	-	-	-	-	-	-	423	462	-	428	441	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	904	-	-	856	-	-	118	151	449	94	118	446
Mov Cap-2 Maneuver	-	-	-	-	-	-	118	151	-	94	118	-
Stage 1	-	-	-	-	-	-	461	493	-	385	385	-
Stage 2	-	-	-	-	-	-	395	438	-	407	436	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.6	24.8	28.5
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	210	904	-	-	856	-	-	165
HCM Lane V/C Ratio	0.137	0.007	-	-	0.052	-	-	0.071
HCM Control Delay (s)	24.8	9	0	-	9.4	-	-	28.5
HCM Lane LOS	C	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	441	5	11	380	0	4	0	23	0	0	0
Future Volume (vph)	1	441	5	11	380	0	4	0	23	0	0	0
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Lane Width (ft)	10	10	10	11	11	11	9	9	9	12	12	12
Grade (%)		0%			0%			-3%			0%	
Storage Length (ft)	0		0	75		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			75			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999						0.884				
Flt Protected				0.950				0.993				
Satd. Flow (prot)	0	1570	0	1561	1627	0	0	1363	0	0	1667	0
Flt Permitted				0.950				0.993				
Satd. Flow (perm)	0	1570	0	1561	1627	0	0	1363	0	0	1667	0
Link Speed (mph)		40			40			35			25	
Link Distance (ft)		817			682			615			938	
Travel Time (s)		13.9			11.6			12.0			25.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	1%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	1	479	5	12	413	0	4	0	25	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	485	0	12	413	0	0	29	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.26	1.20	1.20	1.20	1.29	1.29	1.29	1.15	1.15	1.15
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	1	441	5	11	380	0	4	0	23	0	0	0
Future Vol, veh/h	1	441	5	11	380	0	4	0	23	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	1	0	0	1	2	0	2	0	2	2	2
Mvmt Flow	1	479	5	12	413	0	4	0	25	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	413	0	0	484	0	0	921	921	482	933	923	413
Stage 1	-	-	-	-	-	-	484	484	-	437	437	-
Stage 2	-	-	-	-	-	-	437	437	-	496	486	-
Critical Hdwy	4.12	-	-	4.1	-	-	6.5	5.92	5.9	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.5	4.92	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.5	4.92	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.2	-	-	3.5	4.018	3.3	3.518	4.018	3.318
Pot Cap-1 Maneuver	1146	-	-	1089	-	-	295	315	613	246	270	639
Stage 1	-	-	-	-	-	-	616	598	-	598	579	-
Stage 2	-	-	-	-	-	-	648	623	-	556	551	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1146	-	-	1089	-	-	292	311	613	234	267	639
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	311	-	234	267	-
Stage 1	-	-	-	-	-	-	615	597	-	597	573	-
Stage 2	-	-	-	-	-	-	641	616	-	533	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	12.2	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	527	1146	-	-	1089	-	-	-
HCM Lane V/C Ratio	0.056	0.001	-	-	0.011	-	-	-
HCM Control Delay (s)	12.2	8.1	0	-	8.3	-	-	0
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Appendix H. Forecasted 2048 Design Year With Improvement Intersection Capacity and Queue Analyses

GREENBAG ROAD & DIAMOND AVENUE



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	102	7	542	81	1	445
Future Volume (vph)	102	7	542	81	1	445
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	12	12	12	12
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991		0.982			
Flt Protected	0.955					
Satd. Flow (prot)	1525	0	1600	0	0	1674
Flt Permitted	0.955					
Satd. Flow (perm)	1525	0	1600	0	0	1674
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	5%	0%	2%	0%
Bus Blockages (#/hr)	5	0	0	0	0	0
Adj. Flow (vph)	116	8	616	92	1	506
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	708	0	0	507
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.23	1.20	1.15	1.15	1.18	1.18
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	102	7	542	81	1	445
Future Vol, veh/h	102	7	542	81	1	445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	5	0	2	0
Mvmt Flow	116	8	616	92	1	506

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1170	662	0	0	708	0
Stage 1	662	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.12	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	570	613	-	-	891	-
Stage 1	897	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	569	613	-	-	891	-
Mov Cap-2 Maneuver	569	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	572	891	-
HCM Lane V/C Ratio	-	-	0.217	0.001	-
HCM Control Delay (s)	-	-	13	9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	88	5	500	152	7	592
Future Volume (vph)	88	5	500	152	7	592
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	12	12	12	12
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993		0.969			
Flt Protected	0.955					0.999
Satd. Flow (prot)	1531	0	1610	0	0	1609
Flt Permitted	0.955					0.999
Satd. Flow (perm)	1531	0	1610	0	0	1609
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	3%	0%	0%	4%
Adj. Flow (vph)	92	5	521	158	7	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	0	679	0	0	624
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.15	1.15	1.18	1.18
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	88	5	500	152	7	592
Future Vol, veh/h	88	5	500	152	7	592
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	3	0	0	4
Mvmt Flow	92	5	521	158	7	617

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1231	600	0	0	679	0
Stage 1	600	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Critical Hdwy	3.42	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.42	-	-	-	-	-
Critical Hdwy Stg 2	2.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	546	648	-	-	923	-
Stage 1	904	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	539	648	-	-	923	-
Mov Cap-2 Maneuver	539	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	897	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	544	923	-
HCM Lane V/C Ratio	-	-	0.178	0.008	-
HCM Control Delay (s)	-	-	13	8.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	4	402	71	0	321
Future Volume (vph)	54	4	402	71	0	321
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	12	12	12	12
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990		0.980			
Flt Protected	0.956					
Satd. Flow (prot)	1557	0	1652	0	0	1658
Flt Permitted	0.956					
Satd. Flow (perm)	1557	0	1652	0	0	1658
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	61	5	457	81	0	365
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	0	538	0	0	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.15	1.15	1.18	1.18
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	4	402	71	0	321
Future Vol, veh/h	54	4	402	71	0	321
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	61	5	457	81	0	365

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	863	498	0	0	538	0
Stage 1	498	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	673	709	-	-	1040	-
Stage 1	931	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	673	709	-	-	1040	-
Mov Cap-2 Maneuver	673	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	675	1040	-
HCM Lane V/C Ratio	-	-	0.098	-	-
HCM Control Delay (s)	-	-	10.9	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	102	7	542	81	1	445
Future Volume (vph)	102	7	542	81	1	445
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Storage Length (ft)	0	0		200	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991			0.850		
Flt Protected	0.955					
Satd. Flow (prot)	1525	0	1511	1349	0	1619
Flt Permitted	0.955					
Satd. Flow (perm)	1525	0	1511	1349	0	1619
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	5%	0%	2%	0%
Bus Blockages (#/hr)	5	0	0	0	0	0
Adj. Flow (vph)	116	8	616	92	1	506
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	616	92	0	507
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.23	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	102	7	542	81	1	445
Future Vol, veh/h	102	7	542	81	1	445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	200	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	5	0	2	0
Mvmt Flow	116	8	616	92	1	506

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1124	616	0	0	708	0
Stage 1	616	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.12	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	585	639	-	-	891	-
Stage 1	907	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	584	639	-	-	891	-
Mov Cap-2 Maneuver	584	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	587	891	-
HCM Lane V/C Ratio	-	-	0.211	0.001	-
HCM Control Delay (s)	-	-	12.8	9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	88	5	500	152	7	592
Future Volume (vph)	88	5	500	152	7	592
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Storage Length (ft)	0	0		200	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993			0.850		
Flt Protected	0.955					0.999
Satd. Flow (prot)	1531	0	1540	1349	0	1556
Flt Permitted	0.955					0.999
Satd. Flow (perm)	1531	0	1540	1349	0	1556
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	3%	0%	0%	4%
Adj. Flow (vph)	92	5	521	158	7	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	0	521	158	0	624
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	88	5	500	152	7	592
Future Vol, veh/h	88	5	500	152	7	592
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	200	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	0	3	0	0	4
Mvmt Flow	92	5	521	158	7	617

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1152	521	0	0	679	0
Stage 1	521	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Critical Hdwy	3.42	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.42	-	-	-	-	-
Critical Hdwy Stg 2	2.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	571	695	-	-	923	-
Stage 1	920	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	564	695	-	-	923	-
Mov Cap-2 Maneuver	564	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	897	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	570	923	-
HCM Lane V/C Ratio	-	-	0.17	0.008	-
HCM Control Delay (s)	-	-	12.6	8.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	4	402	71	0	321
Future Volume (vph)	54	4	402	71	0	321
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Storage Length (ft)	0	0		200	0	
Storage Lanes	1	0		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990			0.850		
Flt Protected	0.956					
Satd. Flow (prot)	1557	0	1571	1349	0	1603
Flt Permitted	0.956					
Satd. Flow (perm)	1557	0	1571	1349	0	1603
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	61	5	457	81	0	365
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	0	457	81	0	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.20	1.20	1.26	1.26	1.23	1.23
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	4	402	71	0	321
Future Vol, veh/h	54	4	402	71	0	321
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	200	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-15	-	0	-	-	3
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	0	0	1
Mvmt Flow	61	5	457	81	0	365

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	822	457	0	0	538	0
Stage 1	457	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Critical Hdwy	3.4	4.7	-	-	4.1	-
Critical Hdwy Stg 1	2.4	-	-	-	-	-
Critical Hdwy Stg 2	2.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	687	735	-	-	1040	-
Stage 1	939	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	687	735	-	-	1040	-
Mov Cap-2 Maneuver	687	-	-	-	-	-
Stage 1	939	-	-	-	-	-
Stage 2	958	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	690	1040	-
HCM Lane V/C Ratio	-	-	0.096	-	-
HCM Control Delay (s)	-	-	10.8	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-



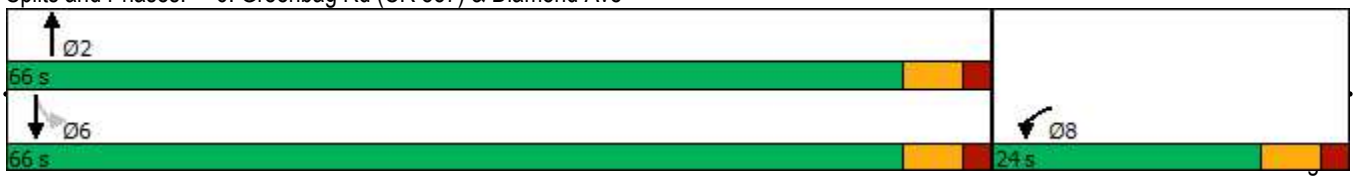
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	102	7	542	81	1	445
Future Volume (vph)	102	7	542	81	1	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991		0.982			
Flt Protected	0.955					
Satd. Flow (prot)	1705	0	1669	0	0	1809
Flt Permitted	0.955					0.999
Satd. Flow (perm)	1705	0	1669	0	0	1807
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3		18			
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	5%	0%	2%	0%
Bus Blockages (#/hr)	5	0	0	0	0	0
Adj. Flow (vph)	116	8	616	92	1	506
Shared Lane Traffic (%)						
Lane Group Flow (vph)	124	0	708	0	0	507
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.07	1.04	1.09	1.09	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (ft)	20		100		20	100
Trailing Detector (ft)	0		0		0	0
Detector 1 Position(ft)	0		0		0	0
Detector 1 Size(ft)	20		6		20	6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6

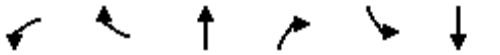


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	24.0		24.0		24.0	24.0
Total Split (s)	24.0		66.0		66.0	66.0
Total Split (%)	26.7%		73.3%		73.3%	73.3%
Maximum Green (s)	18.0		60.0		60.0	60.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Act Effct Green (s)	9.9		37.9			37.9
Actuated g/C Ratio	0.18		0.70			0.70
v/c Ratio	0.40		0.61			0.40
Control Delay	26.4		9.7			6.9
Queue Delay	0.0		0.0			0.0
Total Delay	26.4		9.7			6.9
LOS	C		A			A
Approach Delay	26.4		9.7			6.9
Approach LOS	C		A			A
Queue Length 50th (ft)	36		128			76
Queue Length 95th (ft)	91		266			153
Internal Link Dist (ft)	1022		602			1470
Turn Bay Length (ft)						
Base Capacity (vph)	616		1614			1747
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.20		0.44			0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 54.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 49.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Greenbag Rd (CR 857) & Diamond Ave





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	102	7	542	81	1	445
Future Volume (veh/h)	102	7	542	81	1	445
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	1821	1900	1872	1871
Adj Flow Rate, veh/h	116	8	616	92	1	506
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	5	5	0	0
Cap, veh/h	174	12	828	124	109	1000
Arrive On Green	0.10	0.10	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1686	116	1549	231	1	1870
Grp Volume(v), veh/h	125	0	0	708	507	0
Grp Sat Flow(s),veh/h/ln	1817	0	0	1780	1871	0
Q Serve(g_s), s	2.2	0.0	0.0	10.2	0.0	0.0
Cycle Q Clear(g_c), s	2.2	0.0	0.0	10.2	5.7	0.0
Prop In Lane	0.93	0.06		0.13	0.00	
Lane Grp Cap(c), veh/h	187	0	0	952	1109	0
V/C Ratio(X)	0.67	0.00	0.00	0.74	0.46	0.00
Avail Cap(c_a), veh/h	987	0	0	3222	3489	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	0.0	0.0	6.0	4.9	0.0
Incr Delay (d2), s/veh	4.1	0.0	0.0	1.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.0	5.2	2.9	0.0
LnGrp Delay(d),s/veh	18.4	0.0	0.0	7.1	5.2	0.0
LnGrp LOS	B			A	A	
Approach Vol, veh/h	125		708			507
Approach Delay, s/veh	18.4		7.1			5.2
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		23.7				23.7		9.4
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		60.0				60.0		18.0
Max Q Clear Time (g_c+I1), s		12.2				7.7		4.2
Green Ext Time (p_c), s		5.5				3.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

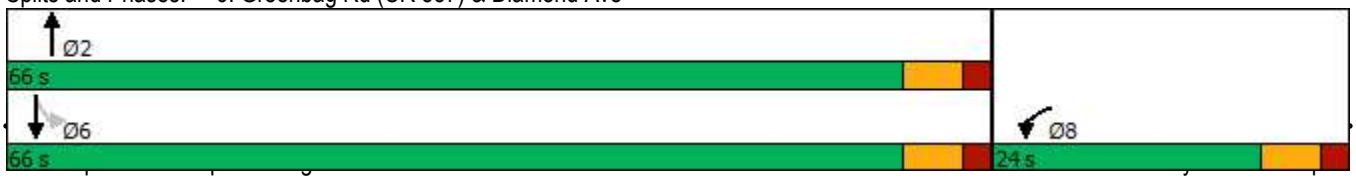


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	88	5	500	152	7	592
Future Volume (vph)	88	5	500	152	7	592
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993		0.969			
Flt Protected	0.955					0.999
Satd. Flow (prot)	1711	0	1680	0	0	1739
Flt Permitted	0.955					0.993
Satd. Flow (perm)	1711	0	1680	0	0	1728
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3		36			
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	3%	0%	0%	4%
Adj. Flow (vph)	92	5	521	158	7	617
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	0	679	0	0	624
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.09	1.09	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (ft)	20		100		20	100
Trailing Detector (ft)	0		0		0	0
Detector 1 Position(ft)	0		0		0	0
Detector 1 Size(ft)	20		6		20	6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	24.0		24.0		24.0	24.0
Total Split (s)	24.0		66.0		66.0	66.0
Total Split (%)	26.7%		73.3%		73.3%	73.3%
Maximum Green (s)	18.0		60.0		60.0	60.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Act Effct Green (s)	8.9		37.0			37.0
Actuated g/C Ratio	0.17		0.70			0.70
v/c Ratio	0.33		0.57			0.51
Control Delay	25.1		8.3			7.8
Queue Delay	0.0		0.0			0.0
Total Delay	25.1		8.3			7.8
LOS	C		A			A
Approach Delay	25.1		8.3			7.8
Approach LOS	C		A			A
Queue Length 50th (ft)	29		108			100
Queue Length 95th (ft)	72		231			205
Internal Link Dist (ft)	1022		602			1470
Turn Bay Length (ft)						
Base Capacity (vph)	633		1650			1696
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.15		0.41			0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 52.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 9.3		Intersection LOS: A	
Intersection Capacity Utilization 51.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Greenbag Rd (CR 857) & Diamond Ave





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	88	5	500	152	7	592
Future Volume (veh/h)	88	5	500	152	7	592
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1924	1961	1857	1900	1872	1800
Adj Flow Rate, veh/h	92	5	521	158	7	617
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	3	3	4	4
Cap, veh/h	157	9	718	218	119	938
Arrive On Green	0.09	0.09	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1711	93	1369	415	5	1788
Grp Volume(v), veh/h	98	0	0	679	624	0
Grp Sat Flow(s),veh/h/ln	1822	0	0	1784	1793	0
Q Serve(g_s), s	1.6	0.0	0.0	9.1	0.0	0.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	9.1	7.9	0.0
Prop In Lane	0.94	0.05		0.23	0.01	
Lane Grp Cap(c), veh/h	167	0	0	936	1057	0
V/C Ratio(X)	0.59	0.00	0.00	0.73	0.59	0.00
Avail Cap(c_a), veh/h	1049	0	0	3423	3526	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.6	0.0	0.0	5.7	5.4	0.0
Incr Delay (d2), s/veh	3.3	0.0	0.0	1.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	4.6	4.0	0.0
LnGrp Delay(d),s/veh	16.9	0.0	0.0	6.8	5.9	0.0
LnGrp LOS	B			A	A	
Approach Vol, veh/h	98		679			624
Approach Delay, s/veh	16.9		6.8			5.9
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		22.4				22.4		8.9
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		60.0				60.0		18.0
Max Q Clear Time (g_c+I1), s		11.1				9.9		3.6
Green Ext Time (p_c), s		5.3				4.5		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.



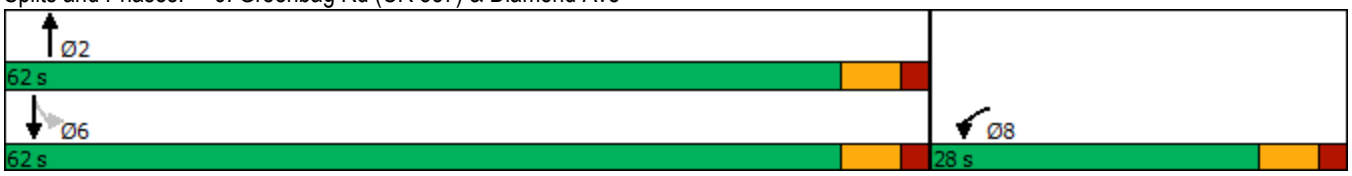
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	4	402	71	0	321
Future Volume (vph)	54	4	402	71	0	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	10	11	11
Grade (%)	-15%		0%			3%
Storage Length (ft)	0	0		200	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990		0.980			
Flt Protected	0.956					
Satd. Flow (prot)	1740	0	1723	0	0	1791
Flt Permitted	0.956					
Satd. Flow (perm)	1740	0	1723	0	0	1791
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4		19			
Link Speed (mph)	35		40			40
Link Distance (ft)	1102		682			1550
Travel Time (s)	21.5		11.6			26.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	61	5	457	81	0	365
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	0	538	0	0	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	9		11			11
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.09	1.09	1.07	1.07
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (ft)	20		100		20	100
Trailing Detector (ft)	0		0		0	0
Detector 1 Position(ft)	0		0		0	0
Detector 1 Size(ft)	20		6		20	6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA			NA
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phase	8		2		6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	5.0
Minimum Split (s)	24.0		24.0		24.0	24.0
Total Split (s)	28.0		62.0		62.0	62.0
Total Split (%)	31.1%		68.9%		68.9%	68.9%
Maximum Green (s)	22.0		56.0		56.0	56.0
Yellow Time (s)	4.0		4.0		4.0	4.0
All-Red Time (s)	2.0		2.0		2.0	2.0
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Act Effct Green (s)	7.7		34.3			34.3
Actuated g/C Ratio	0.17		0.77			0.77
v/c Ratio	0.22		0.40			0.27
Control Delay	20.3		5.6			4.7
Queue Delay	0.0		0.0			0.0
Total Delay	20.3		5.6			4.7
LOS	C		A			A
Approach Delay	20.3		5.6			4.7
Approach LOS	C		A			A
Queue Length 50th (ft)	17		69			43
Queue Length 95th (ft)	44		139			86
Internal Link Dist (ft)	1022		602			1470
Turn Bay Length (ft)						
Base Capacity (vph)	924		1723			1791
Starvation Cap Reductn	0		0			0
Spillback Cap Reductn	0		0			0
Storage Cap Reductn	0		0			0
Reduced v/c Ratio	0.07		0.31			0.20

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 44.6			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 39.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Greenbag Rd (CR 857) & Diamond Ave





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	4	402	71	0	321
Future Volume (veh/h)	54	4	402	71	0	321
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	1884	1900	1872	1853
Adj Flow Rate, veh/h	61	5	457	81	0	365
Adj No. of Lanes	0	0	1	0	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	125	10	705	125	0	839
Arrive On Green	0.07	0.07	0.45	0.45	0.00	0.45
Sat Flow, veh/h	1686	138	1559	276	0	1853
Grp Volume(v), veh/h	67	0	0	538	0	365
Grp Sat Flow(s),veh/h/ln	1852	0	0	1835	0	1853
Q Serve(g_s), s	0.9	0.0	0.0	5.8	0.0	3.4
Cycle Q Clear(g_c), s	0.9	0.0	0.0	5.8	0.0	3.4
Prop In Lane	0.91	0.07		0.15	0.00	
Lane Grp Cap(c), veh/h	137	0	0	831	0	839
V/C Ratio(X)	0.49	0.00	0.00	0.65	0.00	0.44
Avail Cap(c_a), veh/h	1607	0	0	4053	0	4092
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.3	0.0	0.0	5.4	0.0	4.7
Incr Delay (d2), s/veh	2.7	0.0	0.0	0.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	3.0	0.0	1.8
LnGrp Delay(d),s/veh	13.9	0.0	0.0	6.2	0.0	5.1
LnGrp LOS	B			A		A
Approach Vol, veh/h	67		538			365
Approach Delay, s/veh	13.9		6.2			5.1
Approach LOS	B		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		17.5				17.5		7.9
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		56.0				56.0		22.0
Max Q Clear Time (g_c+I1), s		7.8				5.4		2.9
Green Ext Time (p_c), s		3.7				2.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	6.3
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Appendix I. Turn Lane Warrant Evaluation

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Mississippi Avenue**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	2/1/19
	Speed Limit (mph):	40		**Checked by:**	
	Approach Direction:	EB		**Date:**	
Side Street	**Name:**	Mississippi Avenue		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	25			

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Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Mississippi Avenue

Warrant Satisfied? [ ] No [X] Yes 250-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions								
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak						
Traffic Factors	Speed, MPH		40	40	40	40	40	40						
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U						
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40						
	Left Turn Volume	Left Turn Volume (vph)	109	140	34	147	189	46						
		% Heavy Vehiclees	4.59%	0.71%	2.94%	4.59%	0.71%	2.94%						
		Adjusted Volume (vph)	117	142	36	157	191	48						
	Advancing Volume	Total Volume (vph)	349	637	379	471	859	511						
		% Heavy Vehicles	2.87%	1.10%	1.58%	2.87%	1.10%	1.58%						
		Adjusted Volume (vph)	364	648	388	491	873	523						
		% Adjusted Left-Turns	32%	22%	9%	32%	22%	9%						
	Opposing Volume	Total Volume (vph)	575	504	286	775	679	385						
		% Heavy Vehicles	5.91%	1.79%	1.40%	5.91%	1.79%	1.40%						
		Adjusted Volume (vph)	626	518	292	844	697	393						
	Warranting advancing volume (VA)		187	236	427	151	197	385						
Warrant Satisfied?			**YES**	**YES**	**NO**	**YES**	**YES**	**YES**						
Calculated Storage (Feet)			**146**	**178**	**--**	**196**	**239**	**60**						
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**150**	**200**	**--**	**200**	**250**	**125**						

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:** MDS
Intersection	**Greenbag Road (CR 857) & Mississippi Avenue**			
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:** 2/1/19
	Speed Limit (mph):	40		**Checked by:**
	Approach Direction:	EB		**Date:**
Side Street	**Name:**	Mississippi Avenue		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**
	Speed Limit (mph):	25		

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Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Mississippi Avenue

Warrant Satisfied? [ ] No [X] Yes 150-ft storage length"

SCENARIO			2019 Existing Conditions											
			7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U	U	U	U
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40	40	40	40
	Left Turn Volume	Left Turn Volume (vph)	111	14	22	26	42	43	62	66	40	86	79	58
		% Heavy Vehiclees	2.70%	7.14%	9.09%	11.54%	11.90%	9.30%	35.48%	16.67%	7.50%	1.16%	1.27%	1.72%
		Adjusted Volume (vph)	115	15	25	31	49	49	95	83	45	87	81	59
	Advancing Volume	Total Volume (vph)	326	203	210	276	303	309	333	401	412	509	521	314
		% Heavy Vehicles	3.07%	5.91%	5.24%	5.80%	4.95%	3.76%	8.41%	8.23%	3.40%	1.38%	0.77%	0.32%
		Adjusted Volume (vph)	341	221	227	300	325	326	375	451	433	520	527	316
		% Adjusted Left-Turns	34%	7%	11%	10%	15%	15%	25%	18%	10%	17%	15%	19%
	Opposing Volume	Total Volume (vph)	542	413	313	310	259	291	303	318	380	422	357	211
		% Heavy Vehicles	3.51%	9.44%	5.43%	7.10%	4.25%	2.41%	5.61%	5.66%	4.47%	2.37%	2.53%	0.00%
		Adjusted Volume (vph)	571	471	338	343	276	302	328	345	405	437	371	211
	Warranting advancing volume (VA)		195	407	377	385	353	343	274	302	360	284	316	348
Warrant Satisfied?			**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**
Calculated Storage (Feet)			**144**	**--**	**--**	**--**	**--**	**--**	**119**	**104**	**56**	**109**	**101**	**--**
Required Storage (Feet) *Minimum Required 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**150**	**--**	**--**	**--**	**--**	**--**	**125**	**125**	**125**	**125**	**125**	**--**

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Mississippi Avenue**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	2/1/19
	Speed Limit (mph):	40		**Checked by:**	
	Approach Direction:	EB		**Date:**	
Side Street	**Name:**	Mississippi Avenue		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	25			

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Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Mississippi Avenue

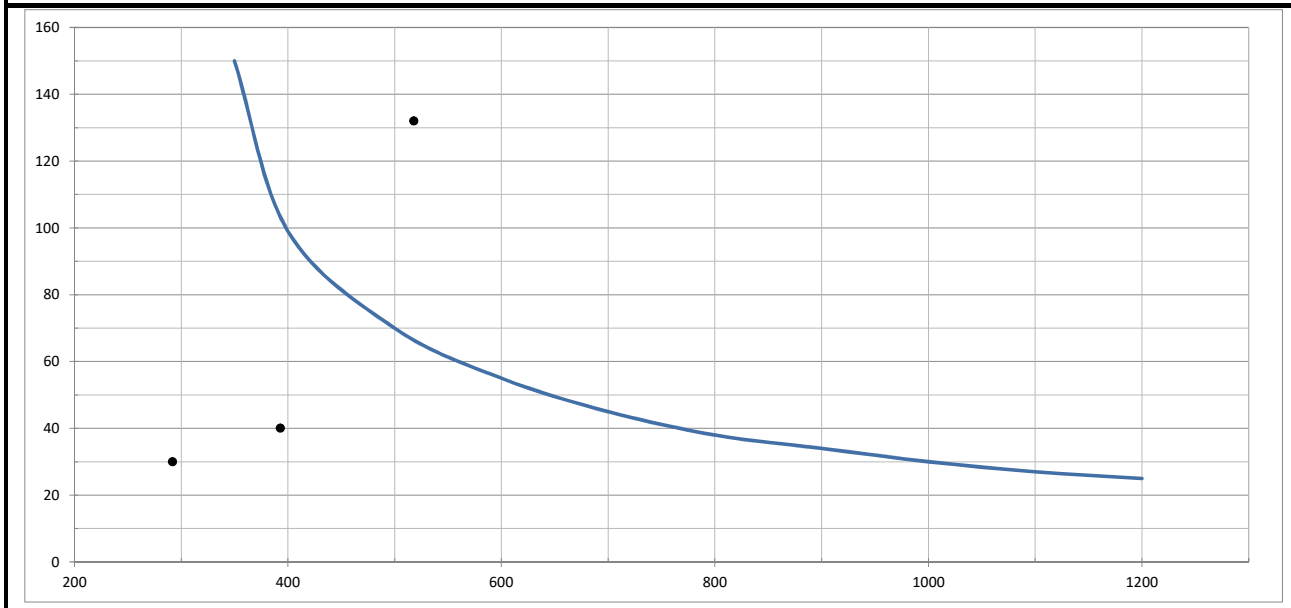
Warrant Satisfied? [ ] No [X] Yes 200-ft storage length"

SCENARIO			2048 Design Year Conditions										
			7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U	U	U	U
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40	40	40	40
	Left Turn Volume	Left Turn Volume (vph)	148	18	29	35	56	57	83	89	53	115	105	77
		% Heavy Vehiclees	2.70%	7.14%	9.09%	11.54%	11.90%	9.30%	35.48%	16.67%	7.50%	1.16%	1.27%	1.72%
		Adjusted Volume (vph)	154	20	33	41	66	65	127	111	59	117	107	79
	Advancing Volume	Total Volume (vph)	435	271	280	369	404	412	444	536	549	680	696	419
		% Heavy Vehicles	3.07%	5.91%	5.24%	5.80%	4.95%	3.76%	8.41%	8.23%	3.40%	1.38%	0.77%	0.32%
		Adjusted Volume (vph)	455	295	302	401	434	435	500	602	577	694	704	421
		% Adjusted Left-Turns	34%	7%	11%	10%	15%	15%	25%	18%	10%	17%	15%	19%
	Opposing Volume	Total Volume (vph)	724	552	418	414	345	388	587	426	507	563	476	282
		% Heavy Vehicles	3.51%	9.44%	5.43%	7.10%	4.25%	2.41%	5.61%	5.66%	4.47%	2.37%	2.53%	0.00%
		Adjusted Volume (vph)	762	630	452	458	367	402	636	462	541	583	494	282
	Warranting advancing volume (VA)		161	346	335	343	318	309	199	267	315	244	279	321
Warrant Satisfied?			**YES**	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Calculated Storage (Feet)			**193**	**--**	**--**	**51**	**83**	**81**	**159**	**139**	**74**	**146**	**134**	**99**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**200**	**--**	**--**	**125**	**125**	**125**	**175**	**150**	**125**	**150**	**150**	**125**

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	10/30/18
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	11/8/18
Intersecting St	**Name:**	Mississippi Road				STAHLSHEAFFER ENGINEERING	
	Speed Limit (mph):	25					
Terrain Type (Level, Rolling, or Mountainous):		Rolling		**Factor:**	2.5		
Intersection:	**Greenbag Road & Mississippi Avenue**						Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Mississippi Avenue**

[ ] Radius Only [X] Full-Width Lane 325-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions						
			AM Peak	**PM Peak**	**SAT Peak**	**AM Peak**	**PM Peak**	**SAT Peak**				
Traffic Factors	Speed, MPH		40	40	40	40	40	40				
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U				
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40				
	Approach Total	Volume (vph)	575	504	286	775	679	385				
		% Heavy Vehicles	5.91%	1.79%	1.40%	5.91%	1.79%	1.40%				
		Adjusted Volume (vph)	626	518	292	844	697	393				
	Right Turns	Volume (vph)	163	132	30	220	178	40				
		% Heavy Vehicles	9.82%	0.00%	0.00%	9.82%	0.00%	0.00%				
		Adjusted Volume (vph)	187	132	30	252	178	40				
	Warranting Volume		52	67	208	36	45	107				
Warrant Satisfied?			**YES**	**YES**	**NO**	**YES**	**YES**	**NO**				
Calculated Storage (Feet)			**234**	**165**	**--**	**315**	**223**	**--**				
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**250**	**175**	**--**	**325**	**225**	**--**				

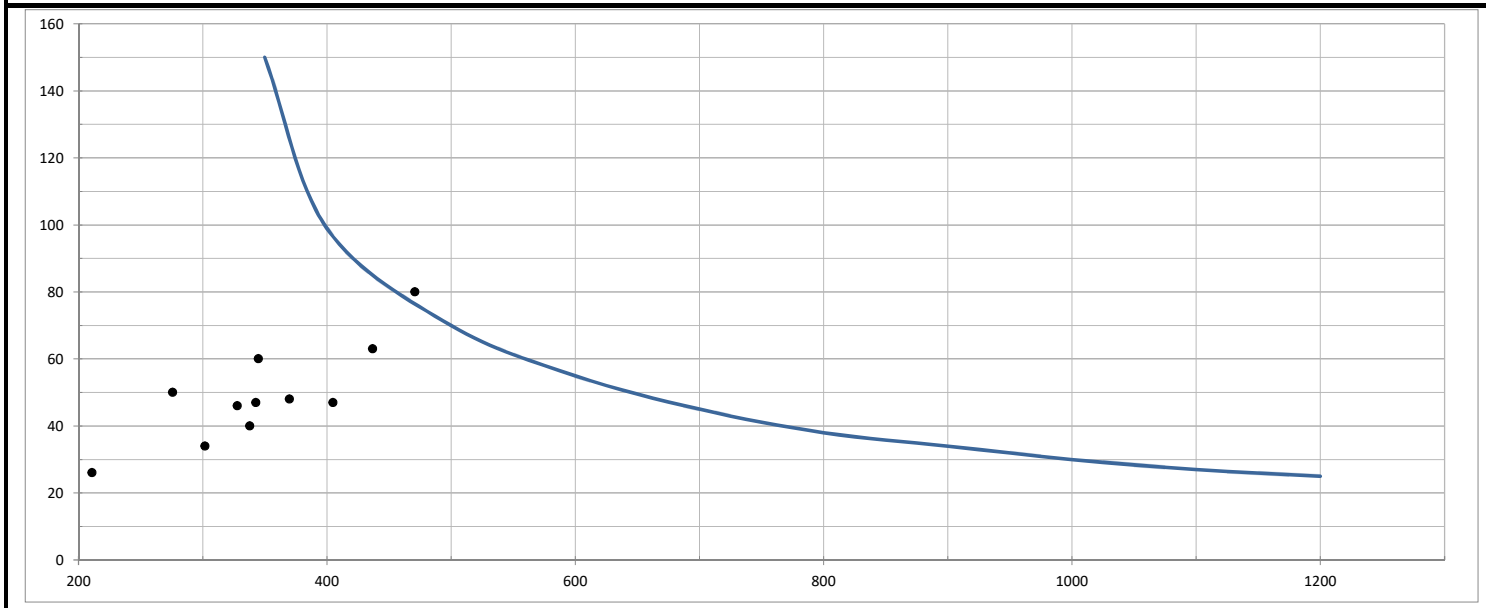
Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	2/4/19
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	2/4/19
Intersecting St	**Name:**	Mississippi Road					
	Speed Limit (mph):	25					
Terrain Type (Level, Rolling, or Mountainous):		Rolling		**Factor:**	2.5		
Intersection:	**Greenbag Road & Mississippi Avenue**						

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Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Mississippi Avenue**

[ ] Radius Only [X] Full-Width Lane 250-ft storage length

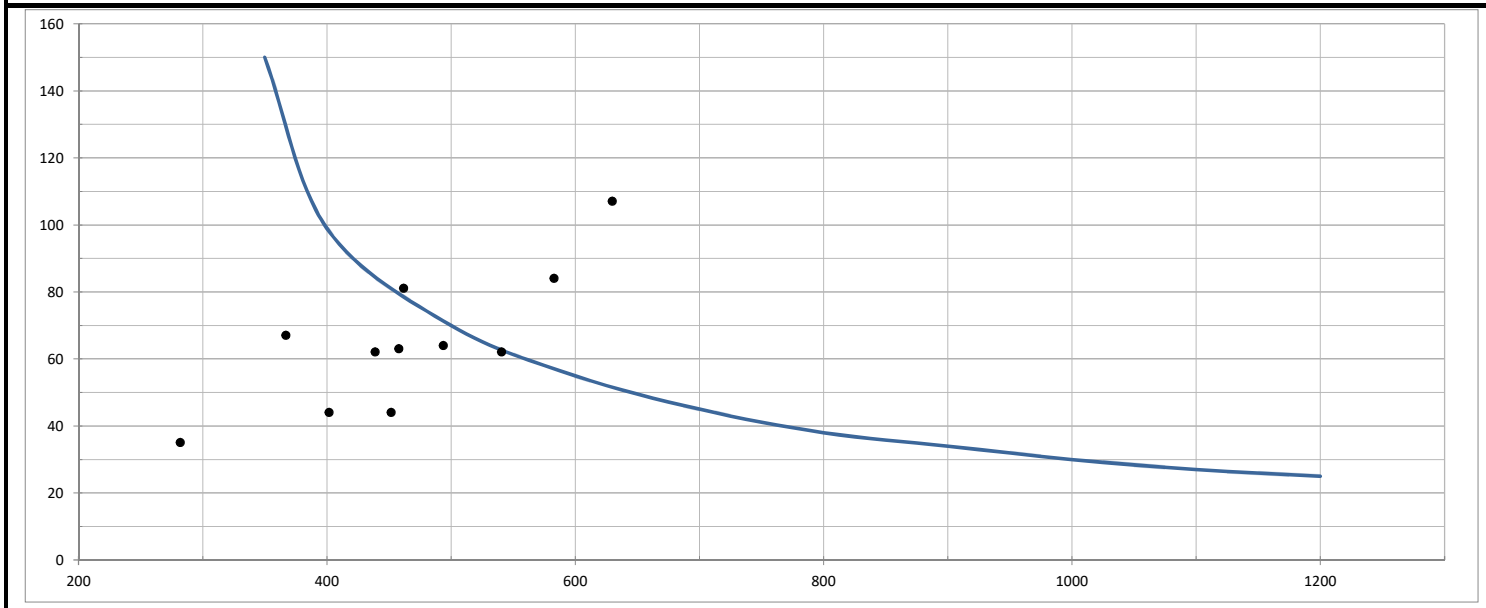


SCENARIO			2019 Existing Conditions										
			7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Traffic Factors	Speed, MPH		0	0	0	0	0	0	0	0	0	0	0	0
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U	U	U	U
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40	40	40	40
	Approach Total	Volume (vph)	542	413	313	310	259	291	303	318	380	422	356	211
		% Heavy Vehicles	3.51%	9.44%	5.43%	7.10%	4.25%	2.41%	5.61%	5.66%	4.47%	2.37%	2.53%	0.00%
		Adjusted Volume (vph)	571	471	338	343	276	302	328	345	405	437	370	211
	Right Turns	Volume (vph)	163	53	33	38	46	32	39	53	44	63	48	26
		% Heavy Vehicles	9.20%	33.96%	15.15%	15.79%	6.52%	3.13%	12.82%	9.43%	4.55%	0.00%	0.00%	0.00%
		Adjusted Volume (vph)	185	80	40	47	50	34	46	60	47	63	48	26
	Warranting Volume		58	77	162	157	224	198	172	155	97	86	130	289
Warrant Satisfied?			**YES**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Calculated Storage (Feet)			**231**	**100**	--	--	--	--	--	--	--	--	--	--
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**250**	**125**	--	--	--	--	--	--	--	--	--	--

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	2/4/19
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	2/4/19
Intersecting St	**Name:**	Mississippi Road				STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25					
Terrain Type (Level, Rolling, or Mountainous):		Rolling		**Factor:**	2.5		
Intersection:	**Greenbag Road & Mississippi Avenue**						Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Mississippi Avenue**

[ ] Radius Only [X] Full-Width Lane 325-ft storage length



SCENARIO			2048 Design Year Conditions										
			7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM
Traffic Factors	Speed, MPH		0	0	0	0	0	0	0	0	0	0	0	0
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U	U	U	U
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40	40	40	40
	Approach Total	Volume (vph)	724	552	418	414	345	388	405	426	507	563	476	282
		% Heavy Vehicles	3.51%	9.44%	5.43%	7.10%	4.25%	2.41%	5.61%	5.66%	4.47%	2.37%	2.53%	0.00%
		Adjusted Volume (vph)	762	630	452	458	367	402	439	462	541	583	494	282
	Right Turns	Volume (vph)	218	71	44	51	61	42	52	71	58	84	64	35
		% Heavy Vehicles	9.20%	33.96%	15.15%	15.79%	6.52%	3.13%	12.82%	9.43%	4.55%	0.00%	0.00%	0.00%
		Adjusted Volume (vph)	248	107	44	63	67	44	62	81	62	84	64	35
	Warranting Volume		41	51	82	80	133	99	86	79	63	57	72	218
Warrant Satisfied?			**YES**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**YES**	**NO**	**NO**
Calculated Storage (Feet)			**310**	**134**	--	--	--	--	--	**101**	--	**105**	--	--
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**325**	**125**	--	--	--	--	--	**125**	--	**125**	--	--

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	108	208	0	0	0	375	148	0	0	0	77	90	0	0	0
	Trucks	0	6	0	0	0	3	0	0	0	0	0	1	0	0	0
	Buses	3	1	0	0	0	1	15	0	0	0	17	12	0	0	0
	Total	111	215	0	0	0	379	163	0	0	0	94	103	0	0	0
	%HV Mvmt	2.70%	3.26%				1.06%	9.20%				18.09%	12.62%			
	%HV App	3.07%					3.51%					15.23%				
8AM	Light Vehicles	13	178	0	0	0	339	35	0	0	0	33	37	0	0	0
	Trucks	0	3	0	0	0	10	11	0	0	0	2	1	0	0	0
	Buses	1	8	0	0	0	11	7	0	0	0	4	4	0	0	0
	Total	14	189	0	0	0	360	53	0	0	0	39	42	0	0	0
	%HV Mvmt	7.14%	5.82%				5.83%	33.96%				15.38%	11.90%			
	%HV App	5.91%					9.44%					13.58%				
9AM	Light Vehicles	20	179	0	0	0	268	28	0	0	0	20	29	0	0	0
	Trucks	1	9	0	0	0	11	3	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	1	2	0	0	0	0	1	0	0	0
	Total	22	188	0	0	0	280	33	0	0	0	23	33	0	0	0
	%HV Mvmt	9.09%	4.79%				4.29%	15.15%				13.04%	12.12%			
	%HV App	5.24%					5.43%					12.50%				
10AM	Light Vehicles	23	237	0	0	0	256	32	0	0	0	32	29	0	0	0
	Trucks	0	13	0	0	0	15	3	0	0	0	3	0	0	0	0
	Buses	3	0	0	0	0	1	3	0	0	0	3	2	0	0	0
	Total	26	250	0	0	0	272	38	0	0	0	38	31	0	0	0
	%HV Mvmt	11.54%	5.20%				5.88%	15.79%				15.79%	6.45%			
	%HV App	5.80%					7.10%					11.59%				
11AM	Light Vehicles	37	251	0	0	0	205	43	0	0	0	52	41	0	0	0
	Trucks	3	10	0	0	0	7	0	0	0	0	0	2	0	0	0
	Buses	2	0	0	0	0	1	3	0	0	0	10	0	0	0	0
	Total	42	261	0	0	0	213	46	0	0	0	62	43	0	0	0
	%HV Mvmt	11.90%	3.83%				3.76%	6.52%				16.13%	4.65%			
	%HV App	4.95%					4.25%					11.43%				
12PM	Light Vehicles	39	256	1	0	0	253	31	0	0	0	29	47	0	0	0
	Trucks	3	10	0	0	0	6	0	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	43	266	1	0	0	259	32	0	0	0	32	50	0	0	0
	%HV Mvmt	9.30%	3.76%				2.32%	3.13%				9.38%	6.00%			
	%HV App	4.53%					2.41%					7.32%				
1PM	Light Vehicles	40	265	0	0	0	252	34	0	0	0	30	35	0	0	0
	Trucks	3	5	0	0	0	11	2	0	0	0	1	2	0	0	0
	Buses	19	1	0	0	0	1	3	0	0	0	2	0	0	0	0
	Total	62	271	0	0	0	264	39	0	0	0	33	37	0	0	0
	%HV Mvmt	35.48%	2.21%				4.55%	12.82%				9.09%	5.41%			
	%HV App	8.41%					5.61%					7.14%				
2PM	Light Vehicles	55	313	0	0	0	252	48	0	0	0	86	105	0	0	0
	Trucks	0	18	0	0	0	8	2	0	0	0	14	1	0	0	0
	Buses	11	4	0	0	0	5	3	0	0	0	10	2	0	0	0
	Total	66	335	0	0	0	265	53	0	0	0	110	108	0	0	0
	%HV Mvmt	16.67%	6.57%				4.91%	9.43%				21.82%	2.78%			
	%HV App	8.23%					5.66%					12.39%				

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	37	361	0	0	0	321	42	0	0	0	56	58	0	0	0
	Trucks	1	7	0	0	0	9	1	0	0	0	1	0	0	0	0
	Buses	2	4	0	0	0	6	1	0	0	0	2	0	0	0	0
	Total	40	372	0	0	0	336	44	0	0	0	59	58	0	0	0
	%HV Mvmt	7.50%	2.96%				4.46%	4.55%				5.08%	0.00%			
	%HV App	3.40%					4.47%					2.56%				
4PM	Light Vehicles	85	417	0	0	0	349	63	0	0	0	38	58	0	0	0
	Trucks	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0
	Buses	1	2	0	0	0	4	0	0	0	0	0	2	0	0	0
	Total	86	423	0	0	0	359	63	0	0	0	38	60	0	0	0
	%HV Mvmt	1.16%	1.42%				2.79%	0.00%				0.00%	3.33%			
	%HV App	1.38%					2.37%					2.04%				
5PM	Light Vehicles	78	439	0	0	0	299	48	0	0	0	27	34	0	0	0
	Trucks	1	2	0	0	0	7	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
	Total	79	442	0	0	0	308	48	0	0	0	27	34	0	0	0
	%HV Mvmt	1.27%	0.68%				2.92%	0.00%				0.00%	0.00%			
	%HV App	0.77%					2.53%					0.00%				
6PM	Light Vehicles	57	256	0	0	0	185	26	0	0	0	26	26	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	58	256	0	0	0	185	26	0	0	0	26	27	0	0	0
	%HV Mvmt	1.72%	0.00%				0.00%	0.00%				0.00%	3.70%			
	%HV App	0.32%					0.00%					1.89%				

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	144	278	0	0	0	501	198	0	0	0	103	120	0	0	0
	Trucks	0	8	0	0	0	4	0	0	0	0	0	1	0	0	0
	Buses	4	1	0	0	0	1	20	0	0	0	23	16	0	0	0
	Total	148	287	0	0	0	506	218	0	0	0	126	137	0	0	0
	%HV Mvmt															
	%HV App															
8AM	Light Vehicles	17	238	0	0	0	453	47	0	0	0	44	49	0	0	0
	Trucks	0	4	0	0	0	13	15	0	0	0	3	1	0	0	0
	Buses	1	11	0	0	0	15	9	0	0	0	5	5	0	0	0
	Total	18	253	0	0	0	481	71	0	0	0	52	55	0	0	0
	%HV Mvmt															
	%HV App															
9AM	Light Vehicles	27	239	0	0	0	358	37	0	0	0	27	39	0	0	0
	Trucks	1	12	0	0	0	15	4	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	1	3	0	0	0	0	1	0	0	0
	Total	29	251	0	0	0	374	44	0	0	0	31	44	0	0	0
	%HV Mvmt															
	%HV App															
10AM	Light Vehicles	31	317	0	0	0	342	43	0	0	0	43	39	0	0	0
	Trucks	0	17	0	0	0	20	4	0	0	0	4	0	0	0	0
	Buses	4	0	0	0	0	1	4	0	0	0	4	3	0	0	0
	Total	35	334	0	0	0	363	51	0	0	0	51	42	0	0	0
	%HV Mvmt															
	%HV App															
11AM	Light Vehicles	49	335	0	0	0	274	57	0	0	0	69	55	0	0	0
	Trucks	4	13	0	0	0	9	0	0	0	0	0	3	0	0	0
	Buses	3	0	0	0	0	1	4	0	0	0	13	0	0	0	0
	Total	56	348	0	0	0	284	61	0	0	0	82	58	0	0	0
	%HV Mvmt															
	%HV App															
12PM	Light Vehicles	52	342	1	0	0	338	41	0	0	0	39	63	0	0	0
	Trucks	4	13	0	0	0	8	0	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	57	355	1	0	0	346	42	0	0	0	43	67	0	0	0
	%HV Mvmt															
	%HV App															
1PM	Light Vehicles	53	354	0	0	0	337	45	0	0	0	40	47	0	0	0
	Trucks	4	7	0	0	0	15	3	0	0	0	1	3	0	0	0
	Buses	25	1	0	0	0	1	4	0	0	0	3	0	0	0	0
	Total	82	362	0	0	0	353	52	0	0	0	44	50	0	0	0
	%HV Mvmt															
	%HV App															
2PM	Light Vehicles	74	418	0	0	0	337	64	0	0	0	115	140	0	0	0
	Trucks	0	24	0	0	0	11	3	0	0	0	19	1	0	0	0
	Buses	15	5	0	0	0	7	4	0	0	0	13	3	0	0	0
	Total	89	447	0	0	0	355	71	0	0	0	147	144	0	0	0
	%HV Mvmt															
	%HV App															

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	49	482	0	0	0	429	56	0	0	0	75	78	0	0	0
	Trucks	1	9	0	0	0	12	1	0	0	0	1	0	0	0	0
	Buses	3	5	0	0	0	8	1	0	0	0	3	0	0	0	0
	Total	53	496	0	0	0	449	58	0	0	0	79	78	0	0	0
	%HV Mvmt															
	%HV App															
4PM	Light Vehicles	114	557	0	0	0	466	84	0	0	0	51	78	0	0	0
	Trucks	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0
	Buses	1	3	0	0	0	5	0	0	0	0	0	3	0	0	0
	Total	115	565	0	0	0	479	84	0	0	0	51	81	0	0	0
	%HV Mvmt															
	%HV App															
5PM	Light Vehicles	104	587	0	0	0	400	64	0	0	0	36	45	0	0	0
	Trucks	1	3	0	0	0	9	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
	Total	105	591	0	0	0	412	64	0	0	0	36	45	0	0	0
	%HV Mvmt															
	%HV App															
6PM	Light Vehicles	76	342	0	0	0	247	35	0	0	0	35	35	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	77	342	0	0	0	247	35	0	0	0	35	36	0	0	0
	%HV Mvmt															
	%HV App															

growth rat	1.16%
yrs	29
factor	1.3364

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:** MDS
Intersection	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**			
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:** 2/1/19
	Speed Limit (mph):	40		**Checked by:** JAG
	Approach Direction:	EB		**Date:** 2/4/19
Side Street	**Name:**	Dorsey Avenue/Kingwood Pike		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**
	Speed Limit (mph):	35 MPH / 45 MPH		

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Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

Warrant Satisfied? [ ] No [X] Yes 250-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Rd			2048 Design Year Conditions With Luckey Lane Termination at Greenbag Rd		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Left Turn Volume	Left Turn Volume (vph)	51	108	67	69	146	90	69	146	90	69	146	90
		% Heavy Vehiclees	7.84%	0.00%	2.99%	7.84%	0.00%	2.99%	7.84%	0.00%	2.99%	7.84%	0.00%	2.99%
		Adjusted Volume (vph)	57	108	70	77	146	94	77	146	94	77	146	94
	Advancing Volume	Total Volume (vph)	350	604	364	472	814	490	472	814	490	472	814	490
		% Heavy Vehicles	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%
		Adjusted Volume (vph)	391	609	373	527	820	502	527	820	502	527	820	502
		% Adjusted Left-Turns	15%	18%	19%	15%	18%	19%	15%	18%	19%	15%	18%	19%
	Opposing Volume	Total Volume (vph)	390	420	253	526	566	341	526	566	341	641	728	400
		% Heavy Vehicles	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%
		Adjusted Volume (vph)	426	423	256	575	571	345	575	571	345	701	734	405
	Warranting advancing volume (VA)		304	282	330	261	242	300	261	242	300	230	205	281
Warrant Satisfied?			**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Calculated Storage (Feet)			**73**	**138**	**89**	**98**	**187**	**120**	**96**	**243**	**118**	**107**	**243**	**118**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**125**	**150**	**125**	**125**	**200**	**125**	**125**	**250**	**125**	**125**	**250**	**125**

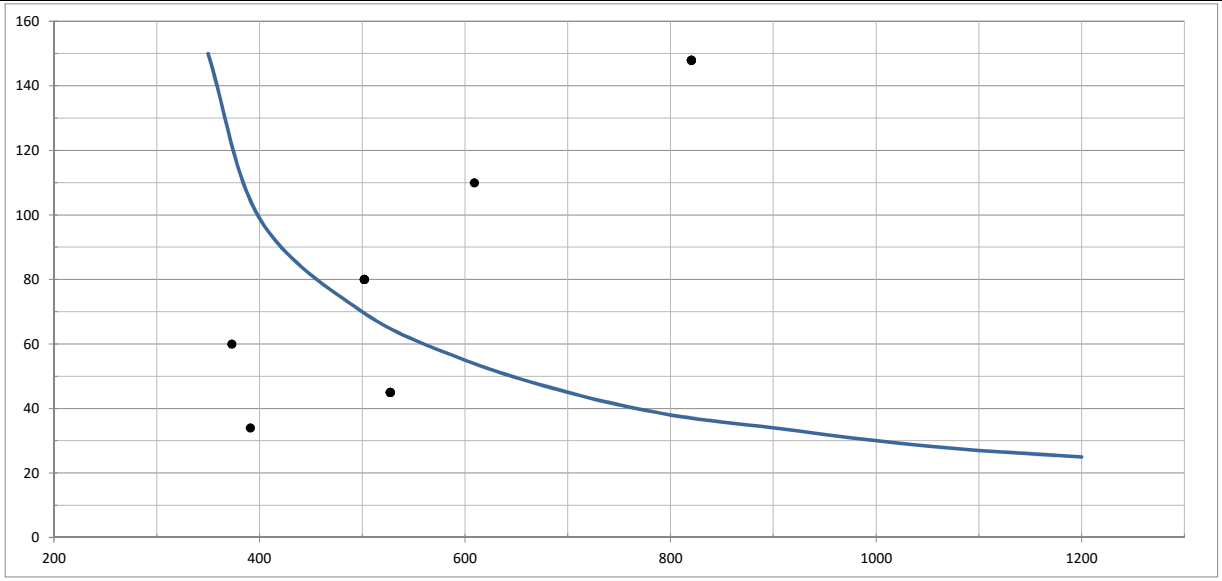
Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	2/4/19
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	EB	EBL	EBT	EBR	**Date:**	02/04/20193
Intersecting St	**Name:**	Dorsey Avenue/Kingwood Pike					
	Speed Limit (mph):	35/45					
Intersection:	**Greenbag Road & Dorsey Avenue/Kingwood Pike**						

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Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **EB Right Turn Lane** **Greenbag Road & Dorsey Avenue/Kingwood Pike**

[ ] Radius Only [X] Full-Width Lane 250-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Termination to Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Approach Total	Volume (vph)	350	604	364	472	814	490	472	814	490	472	814	490
		% Heavy Vehicles	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%
		Adjusted Volume (vph)	391	609	373	527	820	502	527	820	502	527	820	502
	Right Turns	Volume (vph)	26	110	58	35	148	78	35	148	78	35	148	78
		% Heavy Vehicles	19.23%	0.00%	1.72%	19.23%	0.00%	1.72%	19.23%	0.00%	1.72%	19.23%	0.00%	1.72%
		Adjusted Volume (vph)	34	110	60	45	148	80	45	148	80	45	148	80
	Warranting Volume		109	54	127	65	37	70	65	37	70	65	37	70
Warrant Satisfied?			**NO**	**YES**	**NO**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**
Calculated Storage (Feet)			--	**141**	--	--	**189**	**102**	--	**247**	**100**	--	**247**	**100**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	**150**	--	--	**200**	**125**	--	**250**	**125**	--	**250**	**125**

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	2/4/19
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	WB		**Date:**	2/4/19
Side Street	**Name:**	Dorsey Avenue/Kingwood Pike		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	35 MPH / 45 MPH			

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Left-Turn Lane Warrant — WB Left Turn Lane — Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

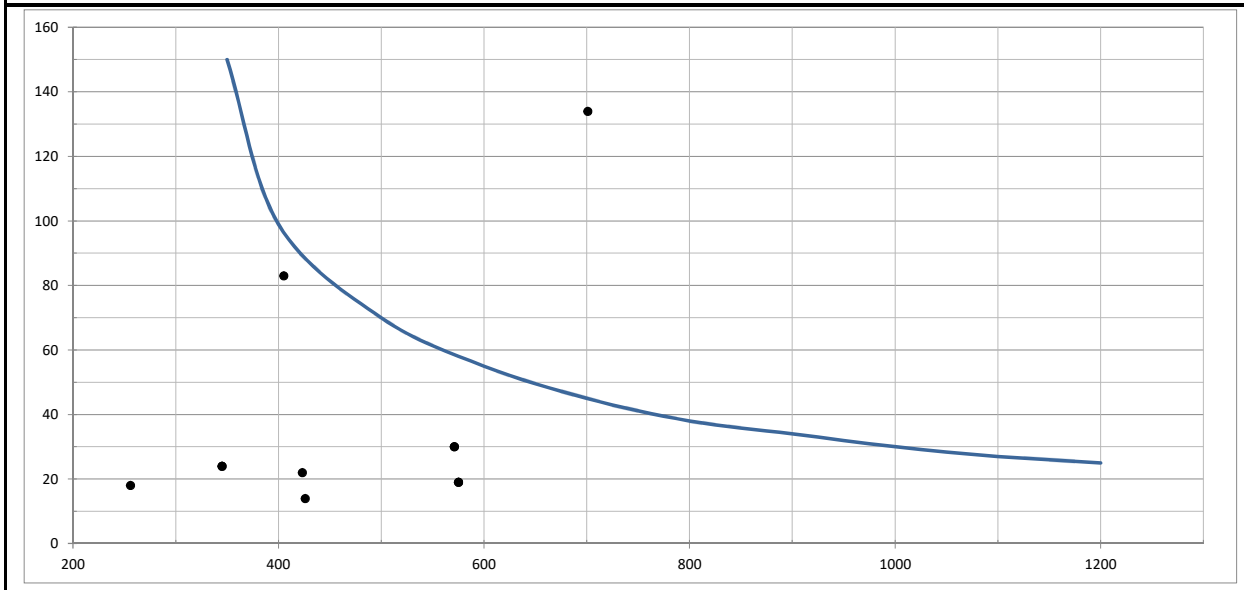
Warrant Satisfied? [ ] No [X] Yes 200-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Termination to Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Left Turn Volume	Left Turn Volume (vph)	23	87	46	31	117	62	31	117	62	31	117	62
		% Heavy Vehiclees	4.55%	0.00%	0.00%	4.55%	0.00%	0.00%	4.55%	0.00%	0.00%	4.55%	0.00%	0.00%
		Adjusted Volume (vph)	25	87	46	33	117	62	33	117	62	33	117	62
	Advancing Volume	Total Volume (vph)	390	420	253	526	566	341	526	566	341	641	728	400
		% Heavy Vehicles	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%
		Adjusted Volume (vph)	426	423	256	575	571	345	575	571	345	701	734	405
		% Adjusted Left-Turns	6%	21%	18%	6%	20%	18%	6%	20%	18%	5%	16%	15%
	Opposing Volume	Total Volume (vph)	350	604	364	472	814	490	472	814	490	472	814	490
		% Heavy Vehicles	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%	7.83%	0.53%	1.68%
		Adjusted Volume (vph)	391	609	373	527	820	502	527	820	502	527	820	502
	Warranting advancing volume (VA)		474	220	296	416	179	258	416	179	258	456	197	275
Warrant Satisfied?			**NO**	**YES**	**NO**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Calculated Storage (Feet)			**--**	**111**	**--**	**42**	**150**	**79**	**41**	**195**	**78**	**46**	**195**	**78**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**--**	**125**	**--**	**125**	**150**	**125**	**125**	**200**	**125**	**125**	**200**	**125**

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS	
Street	**Name:**	Greenbag Road				**Date:**	2/4/19	
	Speed Limit (mph):	40				**Checked by:**	JAG	
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	2/4/19	
Intersecting St	**Name:**	Dorsey Avenue/Kingwood Pike				STAHL SHEAFFER ENGINEERING		
	Speed Limit (mph):	35 MPH /45 MPH						
Intersection:	**Greenbag Road & Dorsey Avenue/Kingwood Pike**					Source: NCHRP Report 457		

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Dorsey Avenue/Kingwood Pike**

[ ] Radius Only [X] Full-Width Lane 325-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	40	40	40
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Approach Total	Volume (vph)	390	420	253	526	566	341	526	566	341	641	728	400
		% Heavy Vehicles	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%	6.23%	0.54%	0.79%
		Adjusted Volume (vph)	426	423	256	575	571	345	575	571	345	701	734	405
	Right Turns	Volume (vph)	14	22	18	19	30	24	19	30	24	134	192	83
		% Heavy Vehicles	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Adjusted Volume (vph)	14	22	18	19	30	24	19	30	24	134	192	83
	Warranting Volume		90	91	244	58	58	155	58	58	155	45	42	97
Warrant Satisfied?			**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**YES**	**NO**
Calculated Storage (Feet)			--	--	--	--	--	--	--	--	--	**186**	**320**	--
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--	--	--	--	--	--	--	--	**175**	**325**	--

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	2/4/19
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	NB		**Date:**	2/4/19
Side Street	**Name:**	Dorsey Avenue/Kingwood Pike		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	35 MPH / 45 MPH			

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Left-Turn Lane Warrant — NB Left Turn Lane — Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

Warrant Satisfied? [ ] No [X] Yes 275-ft storage length"

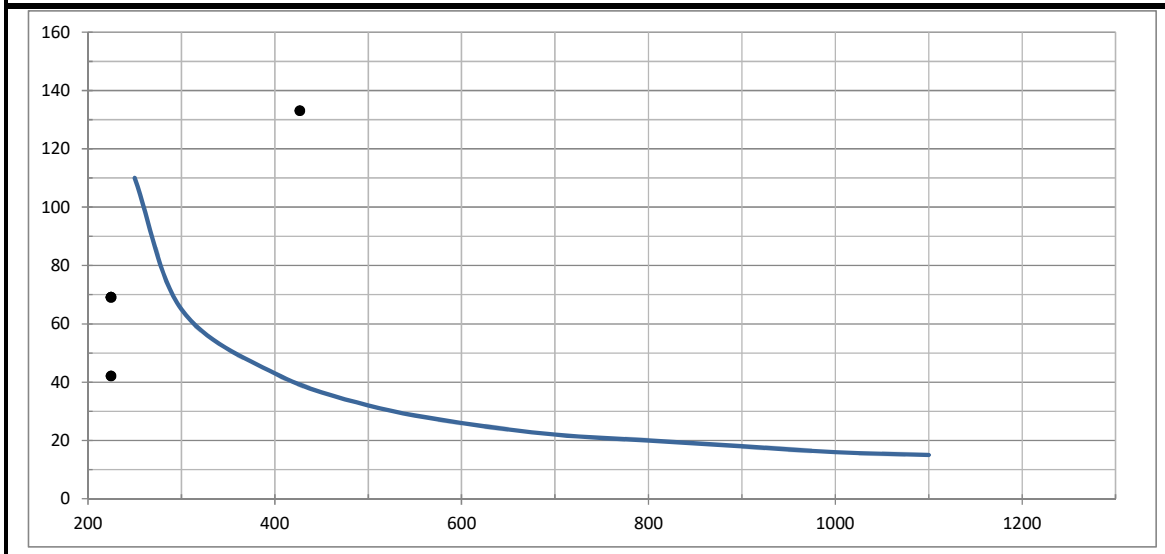
SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Rd			2048 Design Year Conditions With Luckey Lane Termination to Greenbag Rd		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		45	45	45	45	45	45	45	45	45	45	45	45
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Left Turn Volume	Left Turn Volume (vph)	142	52	43	191	70	58	191	70	58	191	70	58
		% Heavy Vehiclees	0.70%	3.85%	0.00%	0.70%	3.85%	0.00%	0.70%	3.85%	0.00%	0.70%	3.85%	0.00%
		Adjusted Volume (vph)	144	55	43	193	74	58	193	74	58	193	74	58
	Advancing Volume	Total Volume (vph)	422	160	116	569	215	157	569	215	157	569	215	157
		% Heavy Vehicles	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%
		Adjusted Volume (vph)	427	168	116	575	225	157	575	225	157	575	225	157
		% Adjusted Left-Turns	34%	33%	37%	34%	33%	37%	34%	33%	37%	34%	33%	37%
	Opposing Volume	Total Volume (vph)	197	363	144	266	489	194	266	489	194	322	562	251
		% Heavy Vehicles	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%
		Adjusted Volume (vph)	217	368	147	293	495	198	293	495	198	354	569	256
	Warranting advancing volume (VA)		267	228	283	245	199	267	245	199	267	230	184	250
Warrant Satisfied?			**YES**	**NO**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**
Calculated Storage (Feet)			**184**	**--**	**--**	**247**	**95**	**--**	**241**	**123**	**--**	**268**	**123**	**--**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO*			**200**	**--**	**--**	**250**	**125**	**--**	**250**	**125**	**--**	**275**	**125**	**--**

Project:	**WVDOH Greenbag Road PIE Traffic Study**				**Calculations:**	MDS	
Major Street	**Name:**	Greenbag Road			**Date:**	2/4/19	
	Speed Limit (mph):	40			**Checked by:**	JAG	
	Approach Direction:	NB	NBL	NBT NBR	**Date:**	2/4/19	
Minor Street	**Name:**	Dorsey Avenue/Kingwood Pike			STAHL SHEAFFER ENGINEERING		
	Speed Limit (mph):	35 MPH /45 MPH					
Intersection:	**Greenbag Road & Dorsey Avenue/Kingwood Pike**				Source: NCHRP Report 457		

Right-Turn Lane Warrant (2 LANE ROAD, 45 MPH OR GREATER)

NB Right Turn Lane
Greenbag Road & Dorsey Avenue/Kingwood Pike

[ ] Radius Only [X] Full-Width Lane 250-ft storage length"



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Termination at Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		45	45	45	45	45	45	45	45	45	45	45	45
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Approach Total	Volume (vph)	422	160	116	569	215	157	569	215	157	569	215	157
		% Heavy Vehicles	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%
		Adjusted Volume (vph)	427	168	116	575	225	157	575	225	157	575	225	157
	Right Turns	Volume (vph)	131	50	31	177	67	42	177	67	42	177	67	42
		% Heavy Vehicles	0.81%	2.27%	0.00%	0.81%	2.27%	0.00%	0.81%	2.27%	0.00%	0.81%	2.27%	0.00%
		Adjusted Volume (vph)	133	52	31	179	69	42	179	69	42	179	69	42
	Warranting Volume		39	184	231	28	133	194	28	133	194	28	133	194
Warrant Satisfied?			**YES**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**NO**	**NO**
Calculated Storage (Feet)			**170**	--	--	**229**	--	--	**224**	--	--	**249**	--	--
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**175**	--	--	**250**	--	--	**225**	--	--	**250**	--	--

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:** MDS
Intersection	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**			
Mainline	**Name:**	Greenbag Road (CR 857)	STAHL SHEAFFER ENGINEERING	**Date:** 2/4/19
	Speed Limit (mph):	40		**Checked by:** JAG
	Approach Direction:	SB		**Date:** 2/4/19
Side Street	**Name:**	Dorsey Avenue/Kingwood Pike		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**
	Speed Limit (mph):	35 MPH / 45 MPH		

Left-Turn Lane Warrant — SB Left Turn Lane — Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)

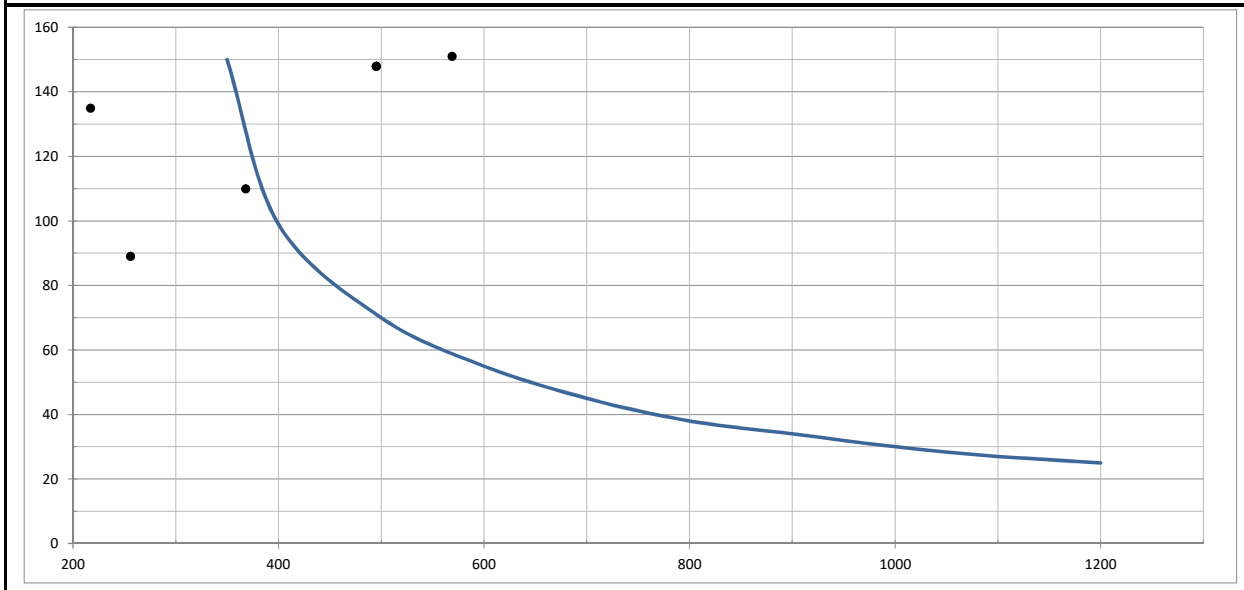
Warrant Satisfied? [ ] No [X] Yes 350-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Tremination to Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		35	35	35	35	35	35	35	35	35	35	35	35
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Left Turn Volume	Left Turn Volume (vph)	63	99	35	85	133	47	85	133	47	141	203	103
		% Heavy Vehiclees	0.00%	1.12%	0.00%	0.00%	1.12%	0.00%	0.00%	1.12%	0.00%	0.00%	1.12%	0.00%
		Adjusted Volume (vph)	63	101	35	85	135	47	85	135	47	141	206	103
	Advancing Volume	Total Volume (vph)	197	363	144	266	489	194	266	489	194	322	562	251
		% Heavy Vehicles	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%
		Adjusted Volume (vph)	217	368	147	293	495	198	293	495	198	354	569	256
		% Adjusted Left-Turns	29%	27%	24%	29%	27%	24%	29%	27%	24%	40%	36%	40%
	Opposing Volume	Total Volume (vph)	422	160	116	569	215	157	569	215	157	569	215	157
		% Heavy Vehicles	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%	0.72%	3.25%	0.00%
		Adjusted Volume (vph)	427	168	116	575	225	157	575	225	157	575	225	157
	Warranting advancing volume (VA)		251	338	377	215	318	360	215	318	360	199	295	312
Warrant Satisfied?			**NO**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**
Calculated Storage (Feet)			**--**	**129**	**--**	**109**	**173**	**--**	**106**	**225**	**--**	**196**	**343**	**--**
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**--**	**150**	**--**	**125**	**175**	**--**	**125**	**225**	**--**	**200**	**350**	**--**

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS	
Street	**Name:**	Greenbag Road				**Date:**	2/4/19	
	Speed Limit (mph):	40				**Checked by:**	JAG	
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	2/4/19	
Intersecting St	**Name:**	Dorsey Avenue/Kingwood Pike				STAHL SHEAFFER ENGINEERING		
	Speed Limit (mph):	35 MPH /45 MPH						
Intersection:	**Greenbag Road & Dorsey Avenue/Kingwood Pike**					Source: NCHRP Report 457		

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Dorsey Avenue/Kingwood Pike**

[ ] Radius Only [X] Full-Width Lane 275-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Connection to Greenbag Road			2048 Design Year Conditions With Luckey Lane Termination to Greenbag Road		
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak
Traffic Factors	Speed, MPH		35	35	35	35	35	35	35	35	35	35	35	35
	# of Signal Phases (U=Unsignalized)		2	2	2	2	2	2	3	3	3	4	4	4
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	39	39	39	39	39	39	40	30	40	36	30	40
	Approach Total	Volume (vph)	197	363	144	266	489	194	266	489	194	322	562	251
		% Heavy Vehicles	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%	6.70%	0.85%	1.40%
		Adjusted Volume (vph)	217	368	147	293	495	198	293	495	198	354	569	256
	Right Turns	Volume (vph)	115	107	62	155	144	84	155	144	84	155	147	85
		% Heavy Vehicles	11.30%	1.87%	3.23%	11.30%	1.87%	3.23%	11.30%	1.87%	3.23%	11.30%	1.87%	3.23%
		Adjusted Volume (vph)	135	110	65	181	148	88	181	148	88	181	151	89
	Warranting Volume		283	132	353	207	72	302	207	72	302	146	59	244
Warrant Satisfied?			**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**NO**	**YES**	**YES**	**NO**
Calculated Storage (Feet)			--	--	--	--	**189**	--	--	**247**	--	**251**	**252**	--
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--	--	--	**200**	--	--	**250**	--	**275**	**275**	--

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Luckey Lane**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	10/30/18
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	EB		**Date:**	11/6/18
Side Street	**Name:**	Luckey Lane		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	25			

STAHL SHEAFFER ENGINEERING

Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Luckey Lane

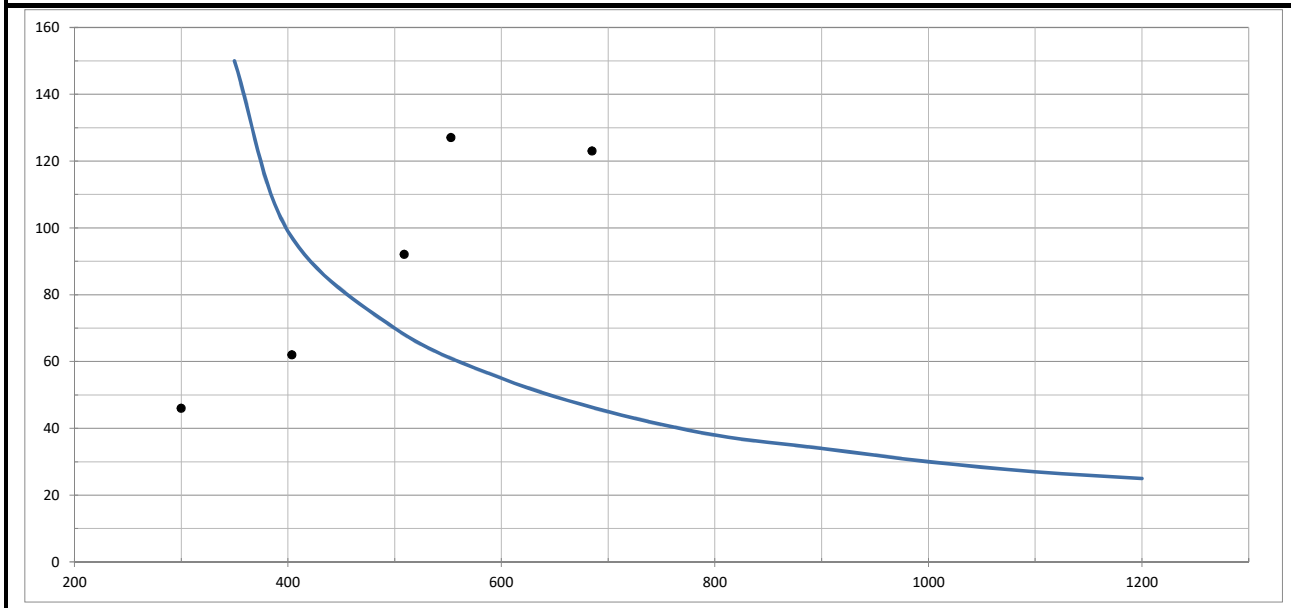
Warrant Satisfied? [X] No [ ] Yes

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions								
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak						
Traffic Factors	Speed, MPH		40	40	40	40	40	40						
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U						
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40						
	Left Turn Volume	Left Turn Volume (vph)	0	0	0	0	0	0						
		% Heavy Vehiclees	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
		Adjusted Volume (vph)	0	0	0	0	0	0						
	Advancing Volume	Total Volume (vph)	410	423	290	553	570	391						
		% Heavy Vehicles	7.82%	0.47%	1.04%	7.82%	0.47%	1.04%						
		Adjusted Volume (vph)	458	426	295	618	574	397						
		% Adjusted Left-Turns	0%	0%	0%	0%	0%	0%						
	Opposing Volume	Total Volume (vph)	480	545	298	647	734	402						
		% Heavy Vehicles	3.96%	0.92%	0.34%	3.96%	0.92%	0.34%						
		Adjusted Volume (vph)	509	553	300	685	744	404						
	Warranting advancing volume (VA)		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!						
Warrant Satisfied?			**NO**	**NO**	**NO**	**NO**	**NO**	**NO**						
Calculated Storage (Feet)			--	--	--	--	--	--						
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--	--	--	--	--						

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	10/31/18
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	2/4/19
Intersecting St	**Name:**	Luckey Lane				STAHLSHEAFFER ENGINEERING	
	Speed Limit (mph):	25					
Intersection:	**Greenbag Road & Luckey Lane**					Source: NCHRP Report 457	

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Luckey Lane**

[ ] Radius Only [X] Full-Width Lane 225-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions						
			AM Peak	**PM Peak**	**SAT Peak**	**AM Peak**	**PM Peak**	**SAT Peak**				
Traffic Factors	Speed, MPH		40	40	40	40	40	40				
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U				
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40				
	Approach Total	Volume (vph)	480	545	298	647	734	402				
		% Heavy Vehicles	3.96%	0.92%	0.34%	3.96%	0.92%	0.34%				
		Adjusted Volume (vph)	509	553	300	685	744	404				
	Right Turns	Volume (vph)	90	127	46	121	171	62				
		% Heavy Vehicles	1.11%	0.00%	0.00%	1.11%	0.00%	0.00%				
		Adjusted Volume (vph)	92	127	46	123	171	62				
	Warranting Volume		69	61	200	46	42	98				
Warrant Satisfied?			**YES**	**YES**	**NO**	**YES**	**YES**	**NO**				
Calculated Storage (Feet)			**115**	**159**	**--**	**154**	**214**	**--**				
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**125**	**175**	**--**	**175**	**225**	**--**				

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Richard Avenue**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	10/30/18
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	EB		**Date:**	11/6/18
Side Street	**Name:**	Richard Avenue		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	25			

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Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Richard Avenue

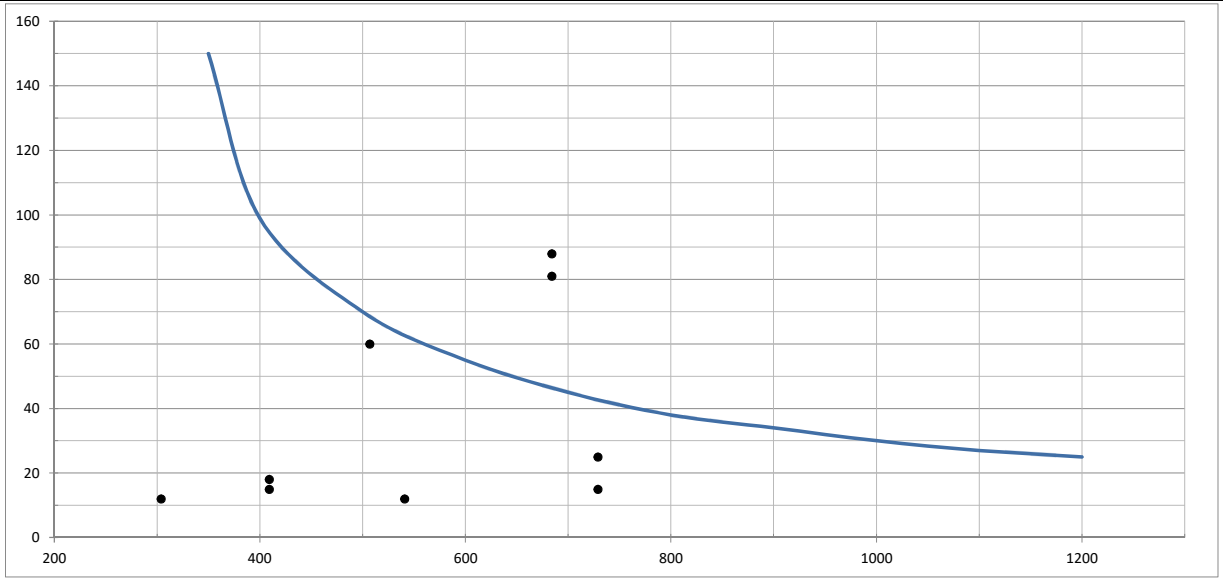
Warrant Satisfied? [ ] No [X] Yes 150-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Terminated					
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak			
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40			
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U			
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40			
	Left Turn Volume	Left Turn Volume (vph)	59	13	7	80	18	9	80	18	9			
		% Heavy Vehiclees	25.42%	0.00%	0.00%	25.42%	0.00%	0.00%	25.42%	0.00%	0.00%			
		Adjusted Volume (vph)	82	13	7	111	18	9	111	18	9			
	Advancing Volume	Total Volume (vph)	454	478	334	612	645	450	609	641	447			
		% Heavy Vehicles	7.27%	0.42%	1.20%	7.27%	0.42%	1.20%	7.27%	0.42%	1.20%			
		Adjusted Volume (vph)	504	481	340	679	649	458	675	645	455			
		% Adjusted Left-Turns	16%	3%	2%	16%	3%	2%	16%	3%	2%			
	Opposing Volume	Total Volume (vph)	468	532	301	631	717	405	631	717	405			
		% Heavy Vehicles	5.56%	1.13%	0.67%	5.56%	1.13%	0.67%	5.56%	1.13%	0.67%			
		Adjusted Volume (vph)	507	541	304	684	729	409	684	729	409			
	Warranting advancing volume (VA)		267	588	861	223	480	788	222	479	785			
Warrant Satisfied?			**YES**	**NO**	**NO**	**YES**	**YES**	**NO**	**YES**	**YES**	**NO**			
Calculated Storage (Feet)			**103**	**--**	**--**	**139**	**23**	**--**	**139**	**23**	**--**			
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**125**	**--**	**--**	**150**	**125**	**--**	**150**	**125**	**--**			

Project:	**WVDOH Greenbag Road PIE Traffic Study**				**Calculations:**	MDS
Street	**Name:**	Greenbag Road			**Date:**	10/31/18
	Speed Limit (mph):	40			**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT WBR	**Date:**	11/6/18
Intersecting St	**Name:**	Richard Avenue			STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25				
Intersection:	**Greenbag Road & Richard Avenue**					Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Richard Avenue**

[ ] Radius Only [X] Full-Width Lane 125-ft storage length

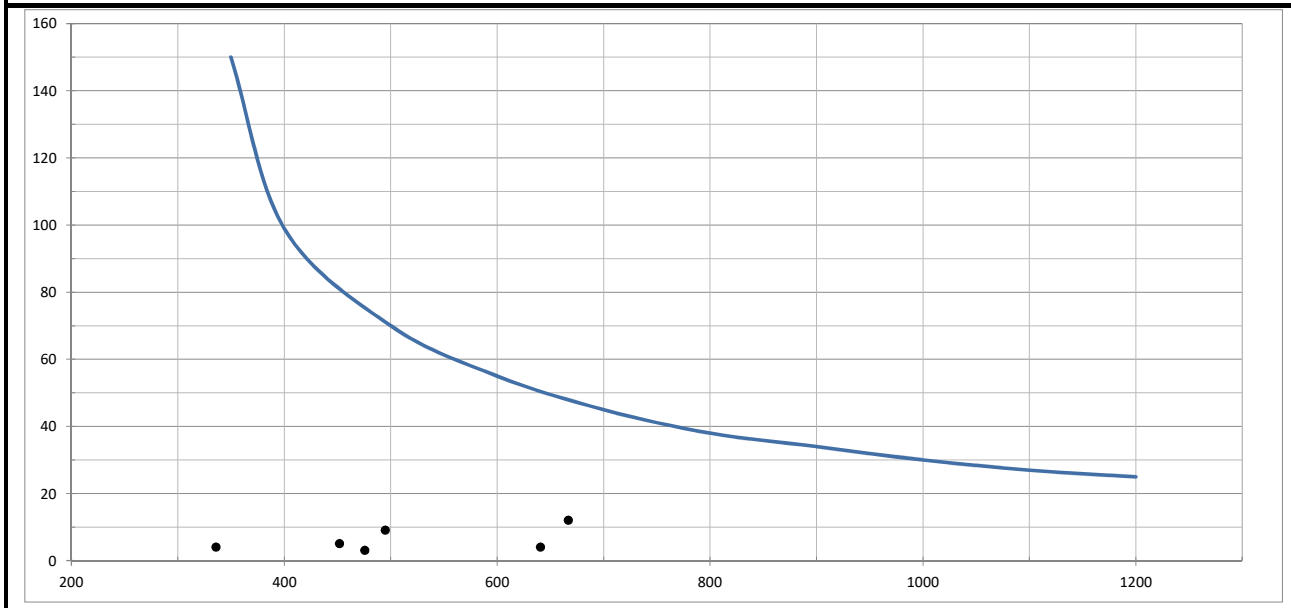


SCENARIO			2018 Existing Conditions			2048 Design Year Conditions			2048 Design Year Conditions With Luckey Lane Terminated at Greenbag Road			
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak	
Traffic Factors	Speed, MPH		40	40	40	40	40	40	40	40	40	
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U	U	U	U	
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40	40	40	40	
	Approach Total	Volume (vph)	468	532	301	631	717	405	631	717	405	
		% Heavy Vehicles	5.56%	1.13%	0.67%	5.56%	1.13%	0.67%	5.56%	1.13%	0.67%	
		Adjusted Volume (vph)	507	541	304	684	729	409	684	729	409	
	Right Turns	Volume (vph)	51	10	10	69	13	13	75	22	16	
		% Heavy Vehicles	11.76%	10.00%	10.00%	11.76%	10.00%	10.00%	11.76%	10.00%	10.00%	
		Adjusted Volume (vph)	60	12	12	81	15	15	88	25	18	
	Warranting Volume		69	63	196	46	43	96	46	43	96	
Warrant Satisfied?			**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**	**NO**	**NO**	
Calculated Storage (Feet)			--	--	--	**101**	--	--	**110**	--	--	
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--	--	**125**	--	--	**125**	--	--	

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	10/31/18
	Speed Limit (mph):	40				**Checked by:**	
	Approach Direction:	EB	EBL	EBT	EBR	**Date:**	
Intersecting St	**Name:**	Lower Aarons Creek Road				STAHLSHEAFFER ENGINEERING	
	Speed Limit (mph):	35					
Intersection:	**Greenbag Road & Lowers Aaron Creek Road**						Source: NCHRP Report 457

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **EB Right Turn Lane** **Greenbag Road & Lowers Aaron Creek Road**

[X] Radius Only [ ] Full-Width Lane



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions						
			AM Peak	**PM Peak**	**SAT Peak**	**AM Peak**	**PM Peak**	**SAT Peak**				
Traffic Factors	Speed, MPH		40	40	40	40	40	40				
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U				
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40				
	Approach Total	Volume (vph)	447	480	331	603	647	446				
		% Heavy Vehicles	4.25%	2.08%	0.91%	4.25%	2.08%	0.91%				
		Adjusted Volume (vph)	476	495	336	641	667	452				
	Right Turns	Volume (vph)	3	9	4	4	12	5				
		% Heavy Vehicles	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
		Adjusted Volume (vph)	3	9	4	4	12	5				
	Warranting Volume		76	72	164	50	48	82				
Warrant Satisfied?			**NO**	**NO**	**NO**	**NO**	**NO**	**NO**				
Calculated Storage (Feet)			--	--	--	--	--	--				
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AAHSTO.*			--	--	--	--	--	--				

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Lower Aarons Creek Road (CR 64)**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	10/30/18
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	WB		**Date:**	2/4/19
Side Street	**Name:**	Lower Aarons Creek Road (CR 64)		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	35 MPH			

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Left-Turn Lane Warrant — WB Left Turn Lane — Greenbag Road (CR 857) & Lower Aarons Creek Road (CR 64)

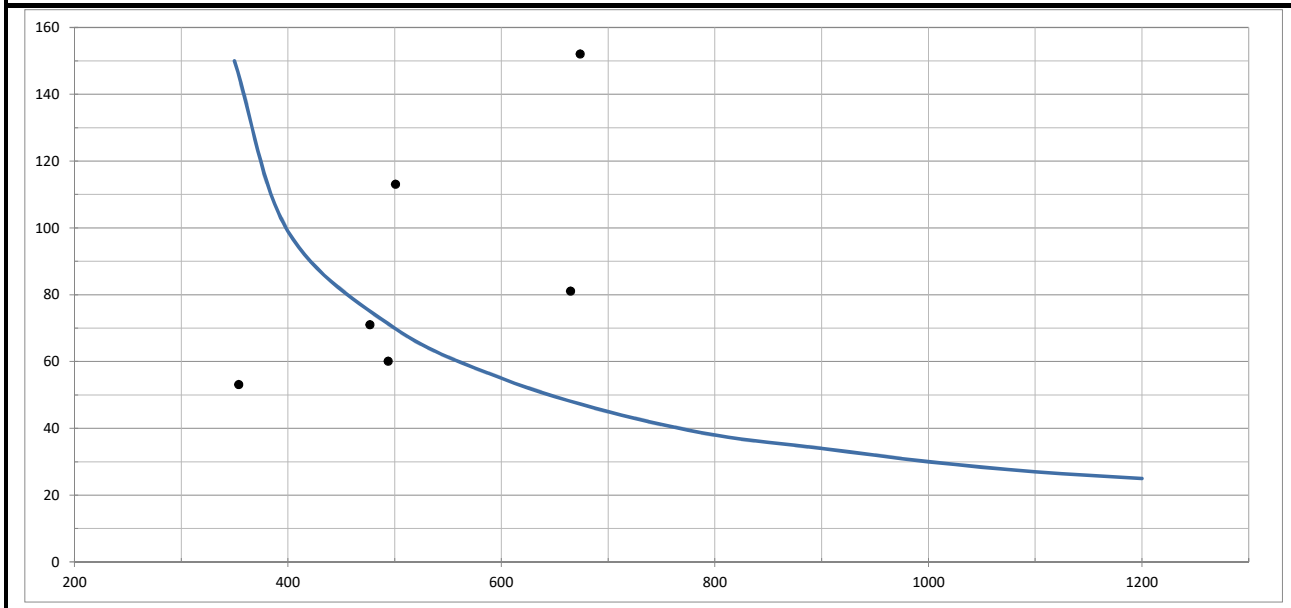
Warrant Satisfied? [ ] No [X] Yes 125-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions								
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak						
Traffic Factors	Speed, MPH		40	40	40	40	40	40						
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U						
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40						
	Left Turn Volume	Left Turn Volume (vph)	4	31	8	5	42	11						
		% Heavy Vehiclees	0.00%	12.90%	0.00%	0.00%	12.90%	0.00%						
		Adjusted Volume (vph)	4	37	8	5	50	11						
	Advancing Volume	Total Volume (vph)	403	508	290	543	685	391						
		% Heavy Vehicles	3.23%	3.74%	0.69%	3.23%	3.74%	0.69%						
		Adjusted Volume (vph)	423	537	293	569	723	395						
		% Adjusted Left-Turns	1%	7%	3%	1%	7%	3%						
	Opposing Volume	Total Volume (vph)	447	480	331	603	647	446						
		% Heavy Vehicles	4.25%	2.08%	0.91%	4.25%	2.08%	0.91%						
		Adjusted Volume (vph)	476	495	336	641	667	452						
	Warranting advancing volume (VA)		1053	394	725	923	331	635						
Warrant Satisfied?			**NO**	**YES**	**NO**	**NO**	**YES**	**NO**						
Calculated Storage (Feet)			**--**	**46**	**--**	**--**	**63**	**--**						
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**--**	**125**	**--**	**--**	**125**	**--**						

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	10/31/18
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	11/6/18
Intersecting St	**Name:**	Diamond Avenue				STAHLSHEAFFER ENGINEERING	
	Speed Limit (mph):	35					
Intersection:	**Greenbag Road & Diamond Avenue**					Source: NCHRP Report 457	

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Diamond Avenue**

[ ] Radius Only [X] Full-Width Lane 200-ft storage length



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions						
			AM Peak	**PM Peak**	**SAT Peak**	**AM Peak**	**PM Peak**	**SAT Peak**				
Traffic Factors	Speed, MPH		40	40	40	40	40	40				
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U				
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40				
	Approach Total	Volume (vph)	462	484	351	623	652	473				
		% Heavy Vehicles	4.55%	2.27%	0.57%	4.55%	2.27%	0.57%				
		Adjusted Volume (vph)	494	501	354	665	674	477				
	Right Turns	Volume (vph)	60	113	53	81	152	71				
		% Heavy Vehicles	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				
		Adjusted Volume (vph)	60	113	53	81	152	71				
	Warranting Volume		72	70	146	48	47	76				
Warrant Satisfied?			**NO**	**YES**	**NO**	**YES**	**YES**	**NO**				
Calculated Storage (Feet)			**--**	**141**	**--**	**101**	**190**	**--**				
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**--**	**150**	**--**	**125**	**200**	**--**				

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Diamond Avenue**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	10/30/18
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	SB		**Date:**	11/6/18
Side Street	**Name:**	Diamond Ave		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	35 MPH			

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Left-Turn Lane Warrant — SB Left Turn Lane — Greenbag Road (CR 857) & Diamond Avenue

Warrant Satisfied? [X] No [ ] Yes

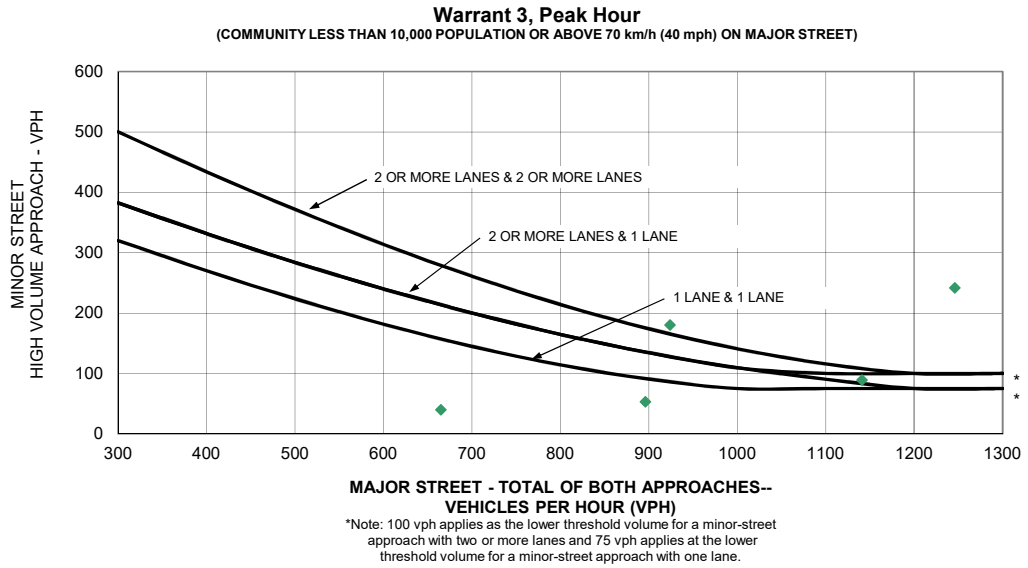
SCENARIO			2018 Existing Conditions			2048 Design Year Conditions								
			AM Peak	PM Peak	SAT Peak	AM Peak	PM Peak	SAT Peak						
Traffic Factors	Speed, MPH		40	40	40	40	40	40						
	# of Signal Phases (U=Unsignalized)		U	U	U	U	U	U						
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40	40	40	40	40						
	Left Turn Volume	Left Turn Volume (vph)	1	5	0	1	7	0						
		% Heavy Vehiclees	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%						
		Adjusted Volume (vph)	1	5	0	1	7	0						
	Advancing Volume	Total Volume (vph)	331	444	238	446	599	321						
		% Heavy Vehicles	4.53%	3.83%	0.84%	4.53%	3.83%	0.84%						
		Adjusted Volume (vph)	354	470	241	476	633	325						
		% Adjusted Left-Turns	0%	1%	0%	0%	1%	0%						
	Opposing Volume	Total Volume (vph)	462	484	351	623	652	473						
		% Heavy Vehicles	4.55%	2.27%	0.57%	4.55%	2.27%	0.57%						
		Adjusted Volume (vph)	494	501	354	665	674	477						
	Warranting advancing volume (VA)		1884	968	#DIV/0!	1836	797	#DIV/0!						
Warrant Satisfied?			**NO**	**NO**	**NO**	**NO**	**NO**	**NO**						
Calculated Storage (Feet)			--	--	--	--	--	--						
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--	--	--	--	--						

Appendix J. Signal Warrant Evaluation

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 45 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 3 - Peak Hour Reduced **Greenbag Road and Mississippi Avenue**

Signal Warrant Satisfied? [X] Yes [ ] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2018 Existing, AM Peak	924	180	86	YES
2018 Existing, PM Peak	1141	89	75	YES
2018 Existing, Saturday Peak	665	40	157	NO
2048 Design Year, AM Peak	1246	242	75	YES
2048 Design Year, PM Peak	1538	119	75	YES
2048 Design Year, Saturday	896	53	91	NO

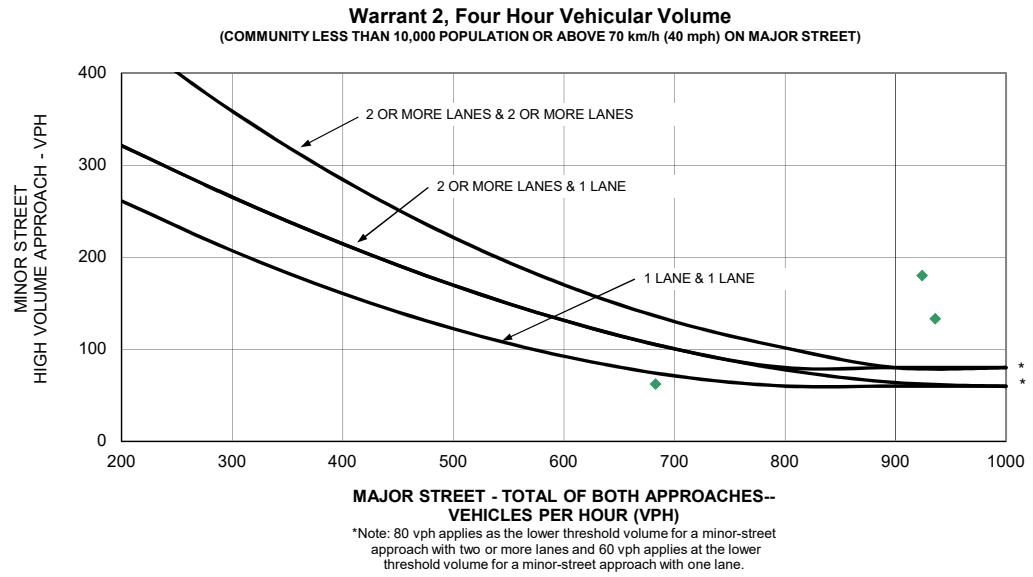
Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 45 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2018 Existing Conditions** **Greenbag Road & Mississippi Ave**

Signal Warrant Satisfied? [X] Yes [ ] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	924	180	60	YES
8:00	683	62	74	NO
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	936	133	60	YES
16:00	1084	88	60	YES
17:00	1055	98	60	YES
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

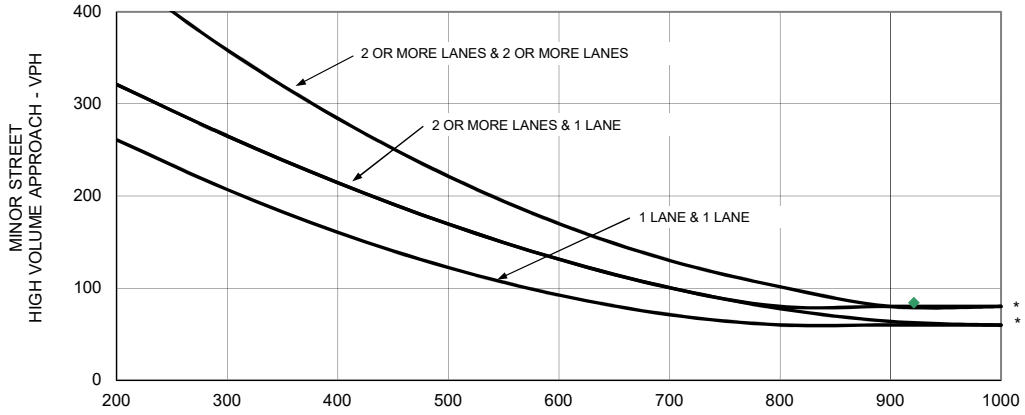
Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 45 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 2 - Four Hour Vehicular Volume **2048 Design Year Conditions** **Greenbag Road & Mississippi Ave**

Signal Warrant Satisfied? [X] Yes [ ] No

Warrant 2, Four Hour Vehicular Volume
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies at the lower threshold volume for a minor-street approach with one lane.

Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	1246	243	60	YES
8:00	921	84	60	YES
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	1262	179	60	YES
16:00	1461	119	60	YES
17:00	1422	132	60	YES
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	108	208	0	0	0	375	148	0	0	0	77	90	0	0	0
	Trucks	0	6	0	0	0	3	0	0	0	0	0	1	0	0	0
	Buses	3	1	0	0	0	1	15	0	0	0	17	12	0	0	0
	Total	111	215	0	0	0	379	163	0	0	0	94	103	0	0	0
	%HV Mvmt	2.70%	3.26%				1.06%	9.20%				18.09%	12.62%			
	%HV App	3.07%					3.51%					15.23%				
8AM	Light Vehicles	13	178	0	0	0	339	35	0	0	0	33	37	0	0	0
	Trucks	0	3	0	0	0	10	11	0	0	0	2	1	0	0	0
	Buses	1	8	0	0	0	11	7	0	0	0	4	4	0	0	0
	Total	14	189	0	0	0	360	53	0	0	0	39	42	0	0	0
	%HV Mvmt	7.14%	5.82%				5.83%	33.96%				15.38%	11.90%			
	%HV App	5.91%					9.44%					13.58%				
9AM	Light Vehicles	20	179	0	0	0	268	28	0	0	0	20	29	0	0	0
	Trucks	1	9	0	0	0	11	3	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	1	2	0	0	0	0	1	0	0	0
	Total	22	188	0	0	0	280	33	0	0	0	23	33	0	0	0
	%HV Mvmt	9.09%	4.79%				4.29%	15.15%				13.04%	12.12%			
	%HV App	5.24%					5.43%					12.50%				
10AM	Light Vehicles	23	237	0	0	0	256	32	0	0	0	32	29	0	0	0
	Trucks	0	13	0	0	0	15	3	0	0	0	3	0	0	0	0
	Buses	3	0	0	0	0	1	3	0	0	0	3	2	0	0	0
	Total	26	250	0	0	0	272	38	0	0	0	38	31	0	0	0
	%HV Mvmt	11.54%	5.20%				5.88%	15.79%				15.79%	6.45%			
	%HV App	5.80%					7.10%					11.59%				
11AM	Light Vehicles	37	251	0	0	0	205	43	0	0	0	52	41	0	0	0
	Trucks	3	10	0	0	0	7	0	0	0	0	0	2	0	0	0
	Buses	2	0	0	0	0	1	3	0	0	0	10	0	0	0	0
	Total	42	261	0	0	0	213	46	0	0	0	62	43	0	0	0
	%HV Mvmt	11.90%	3.83%				3.76%	6.52%				16.13%	4.65%			
	%HV App	4.95%					4.25%					11.43%				
12PM	Light Vehicles	39	256	1	0	0	253	31	0	0	0	29	47	0	0	0
	Trucks	3	10	0	0	0	6	0	0	0	0	3	3	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	43	266	1	0	0	259	32	0	0	0	32	50	0	0	0
	%HV Mvmt	9.30%	3.76%				2.32%	3.13%				9.38%	6.00%			
	%HV App	4.53%					2.41%					7.32%				
1PM	Light Vehicles	40	265	0	0	0	252	34	0	0	0	30	35	0	0	0
	Trucks	3	5	0	0	0	11	2	0	0	0	1	2	0	0	0
	Buses	19	1	0	0	0	1	3	0	0	0	2	0	0	0	0
	Total	62	271	0	0	0	264	39	0	0	0	33	37	0	0	0
	%HV Mvmt	35.48%	2.21%				4.55%	12.82%				9.09%	5.41%			
	%HV App	8.41%					5.61%					7.14%				
2PM	Light Vehicles	55	313	0	0	0	252	48	0	0	0	86	105	0	0	0
	Trucks	0	18	0	0	0	8	2	0	0	0	14	1	0	0	0
	Buses	11	4	0	0	0	5	3	0	0	0	10	2	0	0	0
	Total	66	335	0	0	0	265	53	0	0	0	110	108	0	0	0
	%HV Mvmt	16.67%	6.57%				4.91%	9.43%				21.82%	2.78%			
	%HV App	8.23%					5.66%					12.39%				

		2019 Existing														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	37	361	0	0	0	321	42	0	0	0	56	58	0	0	0
	Trucks	1	7	0	0	0	9	1	0	0	0	1	0	0	0	0
	Buses	2	4	0	0	0	6	1	0	0	0	2	0	0	0	0
	Total	40	372	0	0	0	336	44	0	0	0	59	58	0	0	0
	%HV Mvmt	7.50%	2.96%				4.46%	4.55%				5.08%	0.00%			
	%HV App	3.40%					4.47%					2.56%				
4PM	Light Vehicles	85	417	0	0	0	349	63	0	0	0	38	58	0	0	0
	Trucks	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0
	Buses	1	2	0	0	0	4	0	0	0	0	0	2	0	0	0
	Total	86	423	0	0	0	359	63	0	0	0	38	60	0	0	0
	%HV Mvmt	1.16%	1.42%				2.79%	0.00%				0.00%	3.33%			
	%HV App	1.38%					2.37%					2.04%				
5PM	Light Vehicles	78	439	0	0	0	299	48	0	0	0	27	34	0	0	0
	Trucks	1	2	0	0	0	7	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
	Total	79	442	0	0	0	308	48	0	0	0	27	34	0	0	0
	%HV Mvmt	1.27%	0.68%				2.92%	0.00%				0.00%	0.00%			
	%HV App	0.77%					2.53%					0.00%				
6PM	Light Vehicles	57	256	0	0	0	185	26	0	0	0	26	26	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	58	256	0	0	0	185	26	0	0	0	26	27	0	0	0
	%HV Mvmt	1.72%	0.00%				0.00%	0.00%				0.00%	3.70%			
	%HV App	0.32%					0.00%					1.89%				

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
7AM	Light Vehicles	144	278	0	0	0	501	198	0	0	0	103	120	0	0	0
	Trucks	0	8	0	0	0	4	0	0	0	0	0	1	0	0	0
	Buses	4	1	0	0	0	1	20	0	0	0	23	16	0	0	0
	Total	148	287	0	0	0	506	218	0	0	0	126	137	0	0	0
	%HV Mvmt															
	%HV App															
8AM	Light Vehicles	17	238	0	0	0	453	47	0	0	0	44	49	0	0	0
	Trucks	0	4	0	0	0	13	15	0	0	0	3	1	0	0	0
	Buses	1	11	0	0	0	15	9	0	0	0	5	5	0	0	0
	Total	18	253	0	0	0	481	71	0	0	0	52	55	0	0	0
	%HV Mvmt															
	%HV App															
9AM	Light Vehicles	27	239	0	0	0	358	37	0	0	0	27	39	0	0	0
	Trucks	1	12	0	0	0	15	4	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	1	3	0	0	0	0	1	0	0	0
	Total	29	251	0	0	0	374	44	0	0	0	31	44	0	0	0
	%HV Mvmt															
	%HV App															
10AM	Light Vehicles	31	317	0	0	0	342	43	0	0	0	43	39	0	0	0
	Trucks	0	17	0	0	0	20	4	0	0	0	4	0	0	0	0
	Buses	4	0	0	0	0	1	4	0	0	0	4	3	0	0	0
	Total	35	334	0	0	0	363	51	0	0	0	51	42	0	0	0
	%HV Mvmt															
	%HV App															
11AM	Light Vehicles	49	335	0	0	0	274	57	0	0	0	69	55	0	0	0
	Trucks	4	13	0	0	0	9	0	0	0	0	0	3	0	0	0
	Buses	3	0	0	0	0	1	4	0	0	0	13	0	0	0	0
	Total	56	348	0	0	0	284	61	0	0	0	82	58	0	0	0
	%HV Mvmt															
	%HV App															
12PM	Light Vehicles	52	342	1	0	0	338	41	0	0	0	39	63	0	0	0
	Trucks	4	13	0	0	0	8	0	0	0	0	4	4	0	0	0
	Buses	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Total	57	355	1	0	0	346	42	0	0	0	43	67	0	0	0
	%HV Mvmt															
	%HV App															
1PM	Light Vehicles	53	354	0	0	0	337	45	0	0	0	40	47	0	0	0
	Trucks	4	7	0	0	0	15	3	0	0	0	1	3	0	0	0
	Buses	25	1	0	0	0	1	4	0	0	0	3	0	0	0	0
	Total	82	362	0	0	0	353	52	0	0	0	44	50	0	0	0
	%HV Mvmt															
	%HV App															
2PM	Light Vehicles	74	418	0	0	0	337	64	0	0	0	115	140	0	0	0
	Trucks	0	24	0	0	0	11	3	0	0	0	19	1	0	0	0
	Buses	15	5	0	0	0	7	4	0	0	0	13	3	0	0	0
	Total	89	447	0	0	0	355	71	0	0	0	147	144	0	0	0
	%HV Mvmt															
	%HV App															

		2048Design														
		Green Bag Rd Eastbound					Green Bag Rd Westbound					Mississippi St Southbound				
/		Left	Thru	U-Turn	Peds CW	Peds CCW	Thru	Right	U-Turn	Peds CW	Peds CCW	Left	Right	U-Turn	Peds CW	Peds CCW
3PM	Light Vehicles	49	482	0	0	0	429	56	0	0	0	75	78	0	0	0
	Trucks	1	9	0	0	0	12	1	0	0	0	1	0	0	0	0
	Buses	3	5	0	0	0	8	1	0	0	0	3	0	0	0	0
	Total	53	496	0	0	0	449	58	0	0	0	79	78	0	0	0
	%HV Mvmt															
	%HV App															
4PM	Light Vehicles	114	557	0	0	0	466	84	0	0	0	51	78	0	0	0
	Trucks	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0
	Buses	1	3	0	0	0	5	0	0	0	0	0	3	0	0	0
	Total	115	565	0	0	0	479	84	0	0	0	51	81	0	0	0
	%HV Mvmt															
	%HV App															
5PM	Light Vehicles	104	587	0	0	0	400	64	0	0	0	36	45	0	0	0
	Trucks	1	3	0	0	0	9	0	0	0	0	0	0	0	0	0
	Buses	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
	Total	105	591	0	0	0	412	64	0	0	0	36	45	0	0	0
	%HV Mvmt															
	%HV App															
6PM	Light Vehicles	76	342	0	0	0	247	35	0	0	0	35	35	0	0	0
	Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Buses	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	77	342	0	0	0	247	35	0	0	0	35	36	0	0	0
	%HV Mvmt															
	%HV App															

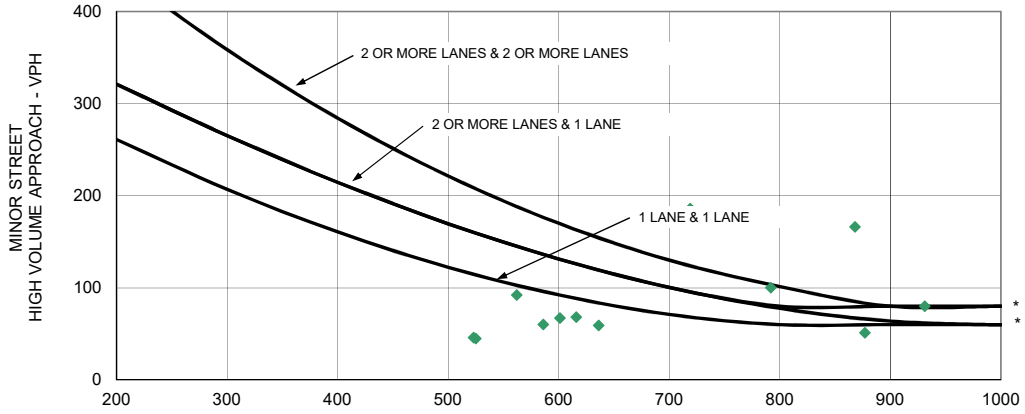
growth rat	1.16%
yrs	29
factor	1.3364

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	2/1/19
	Speed Limit (mph):	40 posted, 45 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 2 - Four Hour Vehicular Volume **2019 Existing Conditions** **Greenbag Road & Mississippi Ave**

Signal Warrant Satisfied? [X] Yes [ ] No

Warrant 2, Four Hour Vehicular Volume
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies at the lower threshold volume for a minor-street approach with one lane.

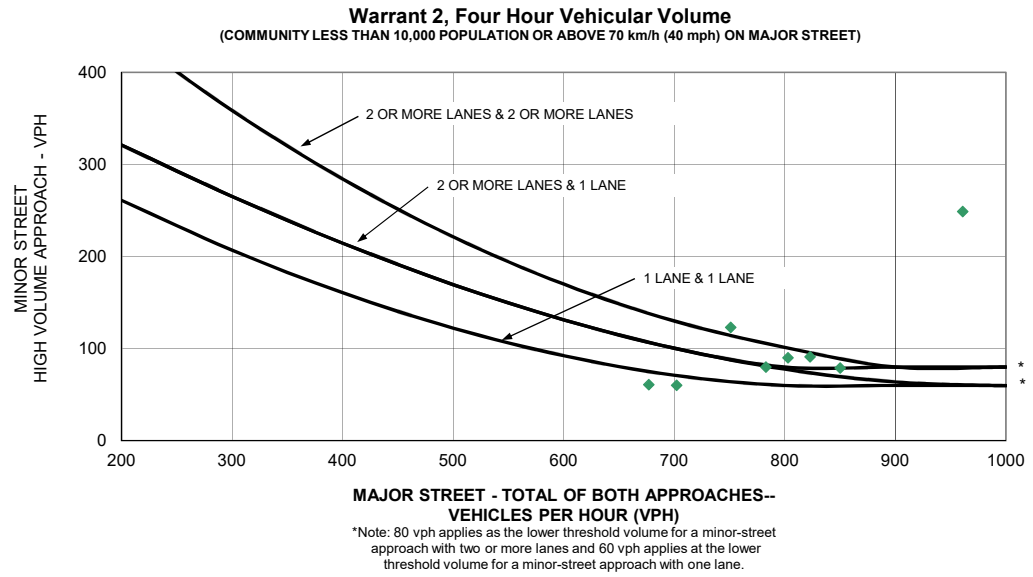
Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	868	166	60	YES
8:00	616	68	88	NO
9:00	523	46	115	NO
10:00	586	60	96	NO
11:00	562	92	103	NO
12:00	601	67	92	NO
13:00	636	59	84	NO
14:00	719	186	68	YES
15:00	792	100	60	YES
16:00	931	80	60	YES
17:00	877	51	60	NO
18:00	525	45	114	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	2/1/19
	Speed Limit (mph):	40 posted, 45 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	1		
	Approach Lanes:	2		
Population < 10000?		No		

Warrant 2 - Four Hour Vehicular Volume **2048 Design Year Conditions** **Greenbag Road & Mississippi Ave**

Signal Warrant Satisfied? [X] Yes [ ] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	1160	222	60	YES
8:00	823	91	60	YES
9:00	677	61	75	NO
10:00	783	80	60	YES
11:00	751	123	64	YES
12:00	803	90	60	YES
13:00	850	79	60	YES
14:00	961	249	60	YES
15:00	1058	134	60	YES
16:00	1244	107	60	YES
17:00	1172	68	60	YES
18:00	702	60	71	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	2/4/19
	Speed Limit (mph):	40	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 1 - Eight Hour Vehicular Volume — **2019 Existing Conditions**

Signal Warrant Satisfied - Condition A?		Yes	X	No
Signal Warrant Satisfied - Condition B?		Yes	X	No
Signal Warrant Satisfied - Combination Conditions?		Yes	X	No

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher volume minor-street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2	1	600	480	420	336	150	120	105	84
2	2	600	480	420	336	200	160	140	112
1	2	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher volume minor-street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2	1	900	720	630	504	75	60	53	42
2	2	900	720	630	504	100	80	70	56
1	2	750	600	525	420	100	80	70	56

Threshold = 100% for basic minimum hourly volume

Threshold = 80% for combination of Conditions A and B after adequate trail of other remedial measures.

Threshold = 70% when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Threshold = 56% for combination of Conditions A and B after adequate trail of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Applicable Threshold

Single = 100%

Combo = 80%

Hour	Major Street					Minor Street					Hourly Threshold Satisfied?		
	Volume	Volume Threshold				Volume	Volume Threshold						
		Single		Combo			Single		Combo		Single		Combo
		A	B	A	B		A	B	A	B	A	B	A&B
0:00	0					0					No	No	No
1:00	0					0					No	No	No
2:00	0					0					No	No	No
3:00	0					0					No	No	No
4:00	0					0					No	No	No
5:00	0					0					No	No	No
6:00	0					0					No	No	No
7:00	868					166					YES	YES	YES
8:00	616					68					No	No	No
9:00	523					46					No	No	No
10:00	586					60					No	No	No
11:00	562	500	750	400	600	92	150	75	120	60	No	No	No
12:00	601					67					No	No	No
13:00	636					59					No	No	No
14:00	719					186					YES	No	YES
15:00	792					100					No	YES	No
16:00	931					80					No	YES	No
17:00	877					51					No	No	No
18:00	525					45					No	No	No
19:00	0					0					No	No	No
20:00	0					0					No	No	No
21:00	0					0					No	No	No
22:00	0					0					No	No	No
23:00	0					0					No	No	No
											NO	**NO**	**NO**

Signal warrant satisfied if either Condition A, Condition B, or Combination is satisfied for each of any 8 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	2/4/19
	Speed Limit (mph):	40	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Mississippi Avenue		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 1 - Eight Hour Vehicular Volume **2048 Design Year Conditions**

Signal Warrant Satisfied - Condition A?		Yes	X	No
Signal Warrant Satisfied - Condition B?	X	Yes		No
Signal Warrant Satisfied - Combination Conditions?		Yes	X	No

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher volume minor-street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2	1	600	480	420	336	150	120	105	84
2	2	600	480	420	336	200	160	140	112
1	2	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher volume minor-street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2	1	900	720	630	504	75	60	53	42
2	2	900	720	630	504	100	80	70	56
1	2	750	600	525	420	100	80	70	56

Threshold = 100% for basic minimum hourly volume

Threshold = 80% for combination of Conditions A and B after adequate trail of other remedial measures.

Threshold = 70% when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Threshold = 56% for combination of Conditions A and B after adequate trail of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

Applicable Threshold

Single = 100%

Combo = 80%

Hour	Major Street					Minor Street					Hourly Threshold Satisfied?		
	Volume	Volume Threshold				Volume	Volume Threshold						
		Single		Combo			Single		Combo		Single		Combo
		A	B	A	B		A	B	A	B	A	B	A&B
0:00	0					0					No	No	No
1:00	0					0					No	No	No
2:00	0					0					No	No	No
3:00	0					0					No	No	No
4:00	0					0					No	No	No
5:00	0					0					No	No	No
6:00	0					0					No	No	No
7:00	1160					222					YES	YES	YES
8:00	823					91					No	YES	No
9:00	677					61					No	No	No
10:00	783					80					No	YES	No
11:00	751	500	750	400	600	123	150	75	120	60	No	YES	YES
12:00	803					90					No	YES	No
13:00	850					79					No	YES	No
14:00	961					249					YES	YES	YES
15:00	1058					134					No	YES	YES
16:00	1244					107					No	YES	No
17:00	1172					68					No	No	No
18:00	702					60					No	No	No
19:00	0					0					No	No	No
20:00	0					0					No	No	No
21:00	0					0					No	No	No
22:00	0					0					No	No	No
23:00	0					0					No	No	No
											NO	**YES**	**NO**

Signal warrant satisfied if either Condition A, Condition B, or Combination is satisfied for each of any 8 hours of an average day.

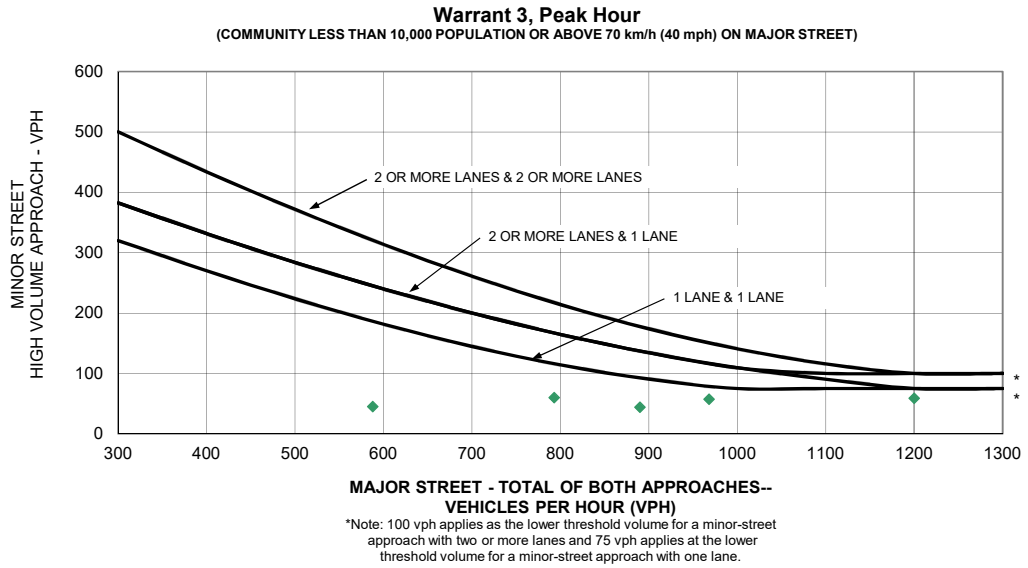
Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Luckey Lane		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 3 - Peak Hour Reduced

Greenbag Road and Luckey Lane

Signal Warrant Satisfied? [X] Yes [ ] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2018 Existing, AM Peak	890	44	93	NO
2018 Existing, PM Peak	968	57	79	NO
2018 Existing, Saturday Peak	588	45	186	NO
2048 Design Year, AM Peak	1200	59	75	NO
2048 Design Year, PM Peak	1304	76	75	YES
2048 Design Year, Saturday	793	60	116	NO

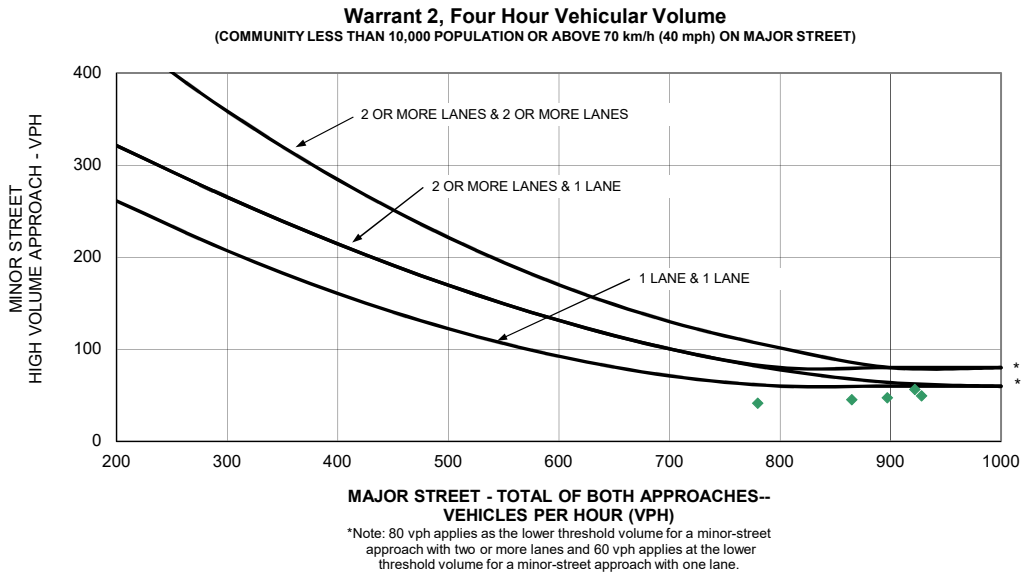
Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Luckey Lane		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

STAHL SHEAFFER ENGINEERING

Warrant 2 - Four Hour Vehicular Volume **2018 Existing Conditions** **Greenbag Road and Luckey Lane**

Signal Warrant Satisfied? [ ] Yes [X] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	865	45	60	NO
8:00	780	41	60	NO
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	897	47	60	NO
16:00	922	56	60	NO
17:00	928	49	60	NO
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**NO**

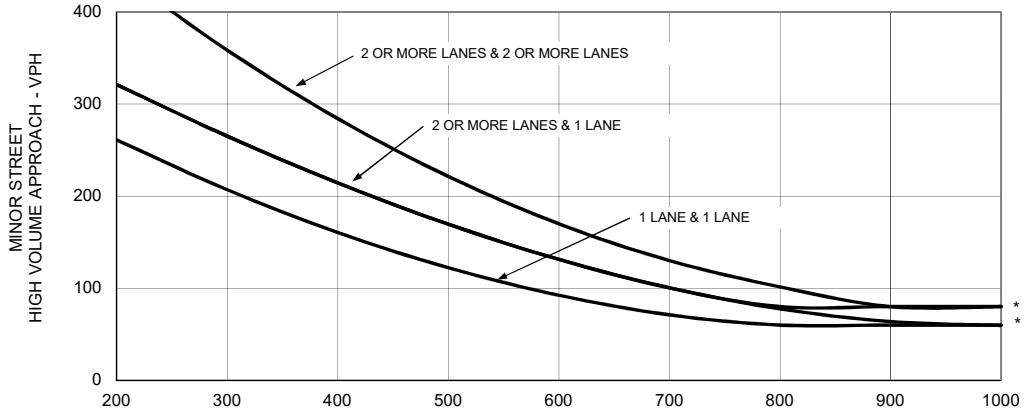
Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Luckey Lane	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 2 - Four Hour Vehicular Volume **2048 Design Year Conditions** **Greenbag Road and Luckey Lane**

Signal Warrant Satisfied? [X] Yes [ ] No

Warrant 2, Four Hour Vehicular Volume
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies at the lower threshold volume for a minor-street approach with one lane.

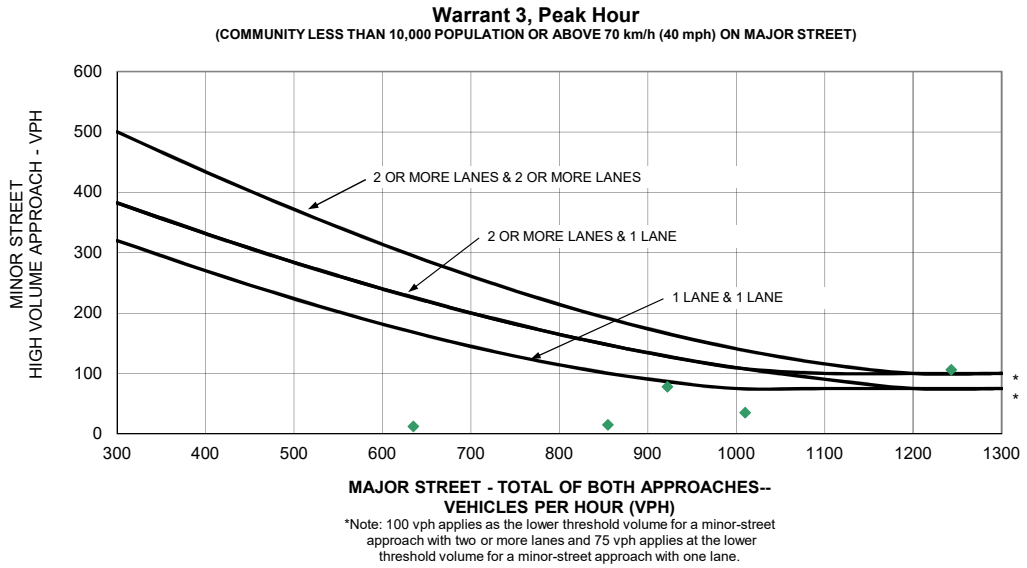
Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	1166	61	60	YES
8:00	1051	55	60	NO
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	1209	63	60	YES
16:00	1243	75	60	YES
17:00	1251	66	60	YES
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Richard Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 3 - Peak Hour Reduced **Greenbag Road and Richard Avenue**

Signal Warrant Satisfied? [X] Yes [ ] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2018 Existing, AM Peak	922	78	86	NO
2018 Existing, PM Peak	1010	35	75	NO
2018 Existing, Saturday Peak	635	12	168	NO
2048 Design Year, AM Peak	1243	106	75	YES
2048 Design Year, PM Peak	1362	48	75	NO
2048 Design Year, Saturday	855	15	100	NO

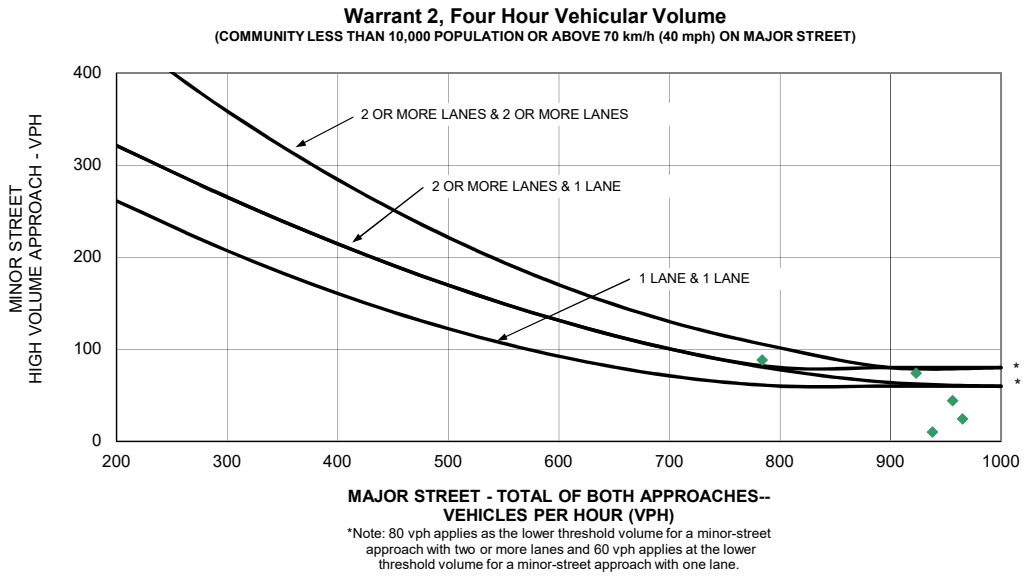
Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road (CR 857)	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Richard Lane		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

STAHL SHEAFFER ENGINEERING

Warrant 2 - Four Hour Vehicular Volume **2018 Existing Conditions**

Signal Warrant Satisfied? [ ] Yes [X] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	938	10	60	NO
8:00	784	88	60	YES
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	923	74	60	YES
16:00	965	24	60	NO
17:00	956	44	60	NO
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**NO**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

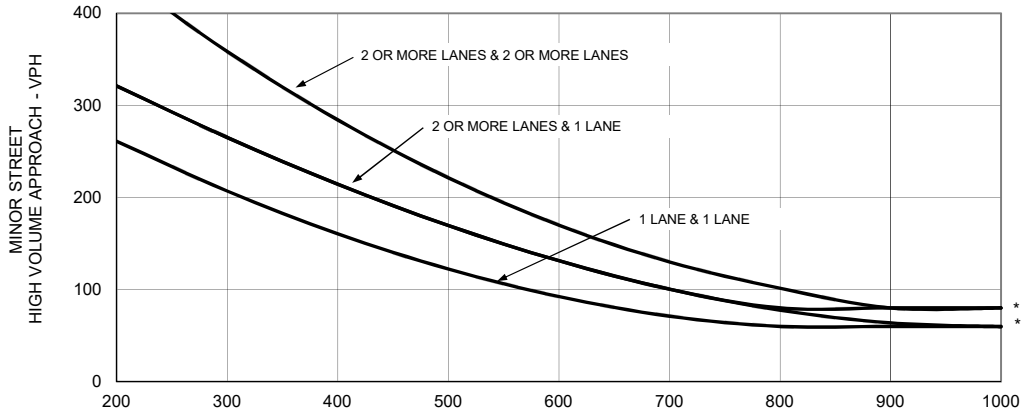
Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road (CR 857)	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 48 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Richard Lane		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2019 No Build (Without Development) Conditions**

Signal Warrant Satisfied? [ ] Yes [X] No

Warrant 2, Four Hour Vehicular Volume
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies at the lower threshold volume for a minor-street approach with one lane.

Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	1264	13	60	NO
8:00	1057	119	60	YES
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	1244	100	60	YES
16:00	1301	32	60	NO
17:00	1289	59	60	NO
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**NO**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

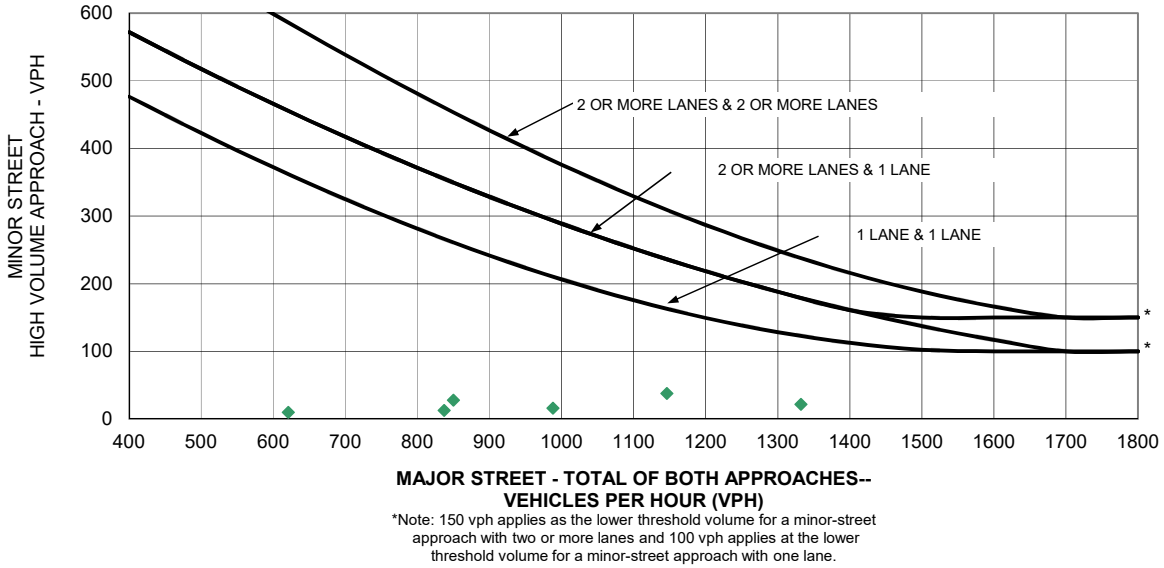
Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 39 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Lower Aarons Creek Road		
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 3 - Peak Hour

Greenbag Road and Lower Aarons Creek Road

Signal Warrant Satisfied? [ ] Yes [X] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2018 Existing, AM Peak	850	28	261	NO
2018 Existing, PM Peak	988	16	210	NO
2018 Existing, Saturday Peak	621	10	362	NO
2048 Design Year, AM Peak	1146	38	163	NO
2048 Design Year, PM Peak	1332	22	123	NO
2048 Design Year, Saturday	837	13	266	NO

Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

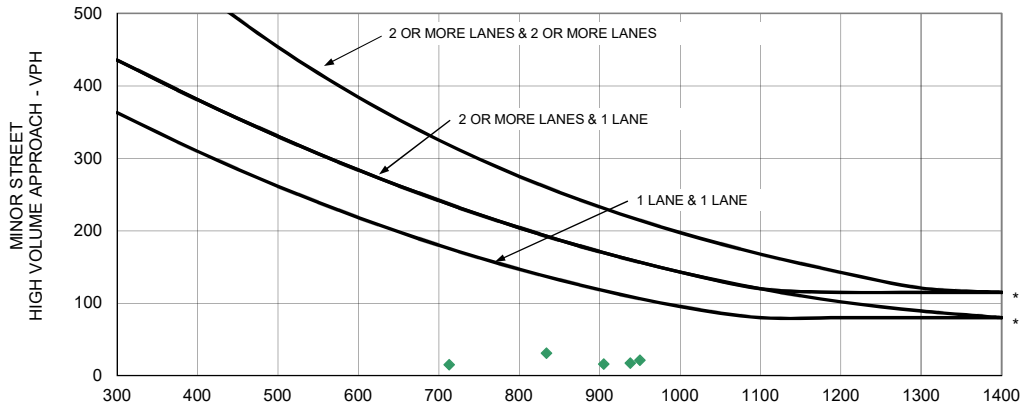
Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 39 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Lower Aarons Creek Road		
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2018 Existing Conditions** **Greenbag Road and Lower Aarons Creek Rd**

Signal Warrant Satisfied? [ ] Yes [X] No

Warrant 2, Four Hour Vehicular Volume



MAJOR STREET - TOTAL OF BOTH APPROACHES--
VEHICLES PER HOUR (VPH)

*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies at the lower threshold volume for a minor-street approach with one lane.

Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			552	NO
1:00			552	NO
2:00			552	NO
3:00			552	NO
4:00			552	NO
5:00			552	NO
6:00			552	NO
7:00	834	31	137	NO
8:00	713	15	175	NO
9:00			552	NO
10:00			552	NO
11:00			552	NO
12:00			552	NO
13:00			552	NO
14:00			552	NO
15:00	938	17	109	NO
16:00	950	21	106	NO
17:00	905	16	117	NO
18:00			552	NO
19:00			552	NO
20:00			552	NO
21:00			552	NO
22:00			552	NO
23:00			552	NO
Signal warrant satisfied?				**NO**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

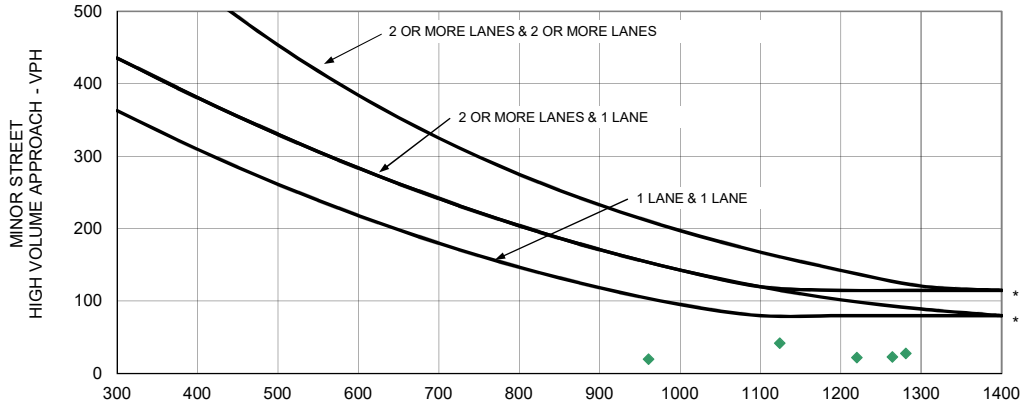
Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 39 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Lower Aarons Creek Road		
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2048 Design Yr Conditions** **Greenbag Road and Lower Aarons Creek Rd**

Signal Warrant Satisfied? [ ] Yes [X] No

Warrant 2, Four Hour Vehicular Volume



MAJOR STREET - TOTAL OF BOTH APPROACHES--
VEHICLES PER HOUR (VPH)

*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies at the lower threshold volume for a minor-street approach with one lane.

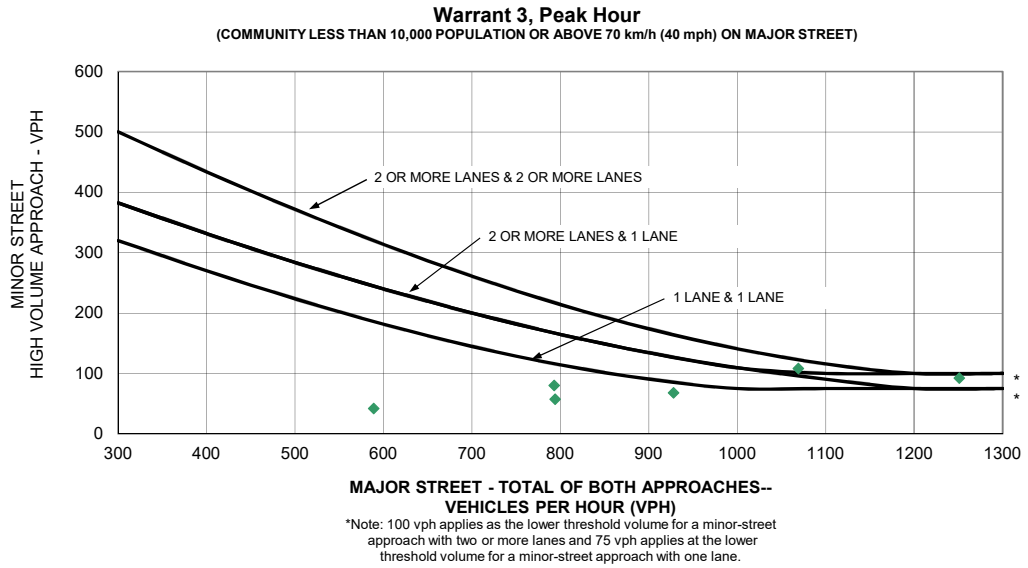
Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			552	NO
1:00			552	NO
2:00			552	NO
3:00			552	NO
4:00			552	NO
5:00			552	NO
6:00			552	NO
7:00	1124	42	80	NO
8:00	961	20	104	NO
9:00			552	NO
10:00			552	NO
11:00			552	NO
12:00			552	NO
13:00			552	NO
14:00			552	NO
15:00	1264	23	80	NO
16:00	1281	28	80	NO
17:00	1220	22	80	NO
18:00			552	NO
19:00			552	NO
20:00			552	NO
21:00			552	NO
22:00			552	NO
23:00			552	NO
Signal warrant satisfied?				**NO**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	10/31/18
	Speed Limit (mph):	40 posted, 51 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Diamond Avenue	STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

Warrant 3 - Peak Hour Reduced **Greenbag Road and Diamond Avenue**

Signal Warrant Satisfied? [X] Yes [ ] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2018 Existing, AM Peak	793	80	116	NO
2018 Existing, PM Peak	928	68	85	NO
2018 Existing, Saturday Peak	589	42	186	NO
2048 Design Year, AM Peak	1069	108	75	YES
2048 Design Year, PM Peak	1251	92	75	YES
2048 Design Year, Saturday	794	57	116	NO

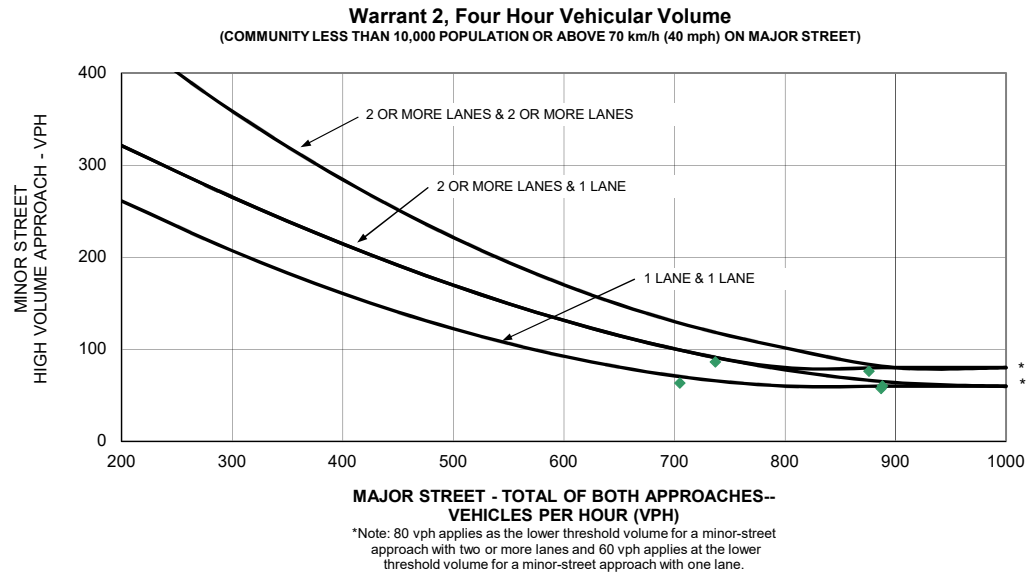
Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 51 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Diamond Avenue		
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2018 Existing Conditions** **Greenbag Road & Diamond Ave**

Signal Warrant Satisfied? [ ] Yes [X] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	737	86	65	YES
8:00	705	63	70	NO
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	876	76	60	YES
16:00	888	60	60	YES
17:00	887	57	60	NO
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**NO**

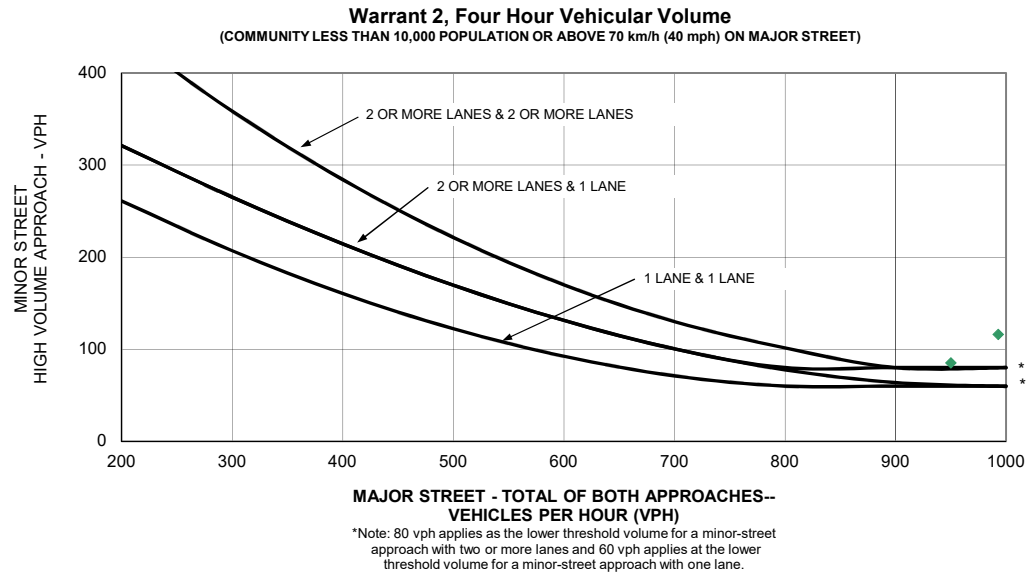
Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

Project:		WVDOH Greenbag Road PIE Traffic Study	**Calculations:**	mds
Major Street	**Name:**	Greenbag Road	**Date:**	11/1/18
	Speed Limit (mph):	40 posted, 51 85th %-tile	**Checked by:**	
	Approach Lanes:	1	**Date:**	
Minor Street	**Name:**	Diamond Avenue		
	Speed Limit (mph):	35		
	Approach Lanes:	1		
Population < 10000?		No		

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Warrant 2 - Four Hour Vehicular Volume **2048 Design YrConditions** **Greenbag Road & Diamond Ave**

Signal Warrant Satisfied? [X] Yes [ ] No



Hour	Major Street (vph)	Minor Street (vph)	Hourly Threshold Minor Street	Hourly Threshold Satisfied?
0:00			391	NO
1:00			391	NO
2:00			391	NO
3:00			391	NO
4:00			391	NO
5:00			391	NO
6:00			391	NO
7:00	993	116	60	YES
8:00	950	85	60	YES
9:00			391	NO
10:00			391	NO
11:00			391	NO
12:00			391	NO
13:00			391	NO
14:00			391	NO
15:00	1181	102	60	YES
16:00	1197	81	60	YES
17:00	1196	77	60	YES
18:00			391	NO
19:00			391	NO
20:00			391	NO
21:00			391	NO
22:00			391	NO
23:00			391	NO
Signal warrant satisfied?				**YES**

Signal warrant satisfied if hourly threshold satisfied for each of any 4 hours of an average day.

First, determine which lane configuration represents the leg that is being studied. Then, based on the movements for each hour, find the percent reduction for each hour with the Pagones Theorem*.

Situation	Approach Configuration	Pagones Theorem Condition	Reduction of right turns
1	Shared left/through right	R > 0.7A	Reduce R by 60 percent
		0.7A≥ R > 0.35A	Reduce R by 30 percent
		R ≤ 0.35A	Reduce R by 20 percent
2	Exclusive left, shared through/right	R >3T	Reduce R by 60 percent
		3T ≥ R ≥ T/3	Reduce R by 30 percent
		R ≤ T/3	Reduce R by 20 percent
3	Any configuration with an exclusive right turn lane (usually ≥ 600 feet long)		Reduce R by 75 percent in all cases
4	Shared left/through and shared through/right	R > (T+L)	Reduce R by 65 percent
		L > (T+R)	Use Situation 2
		L = T = R (± 10 vehicles)	Reduce R by 40 percent
		L = T > 3R	Reduce R by 20 percent
		R = T >3L	Reduce R by 50 percent
		All other cases	Reduce R by 30 percent
5	Exclusive left, exclusive through and shared through/right	R > T	Reduce R by 75 percent
		T ≥ R ≥ T/2	Reduce R by 50 percent
		T/2 ≥ R > T/4	Reduce R by 30 percent
		R ≤ T/4	Reduce R by 15 percent

Where:

L = number of left turning vehicles in approach

Peak Hour Signal Warrant Volume Development

Approach	Movement	2018 Existing Conditions (BALANCED) Percent Right Turns[1]			Forecasted 2048 Design Year (2018 Existing Yr Bal + 30 Yrs) Percent Right Turns[1]		
		Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
Intersection:	**Greenbag Road (CR 857) & Mississippi Avenue**						
Mainline Volume	**EB/WB Total**	**924**	**1141**	**665**	**1246**	**1538**	**896**
Side Street	SB Left	107	41	21	144	55	28
	SB Right	104	68	27	140	92	36
	SB Total	211	109	48	284	147	64
	=0.7*SB	147.7	76.3	33.6	198.8	102.9	44.8
	=0.35*SB	73.85	38.15	16.8	99.4	51.45	22.4
	RT Red.	30%	30%	30%	30%	30%	30%
Side Street Volume	**SB Total w Red.**	**180**	**89**	**40**	**242**	**119**	**53**
Intersection:	**Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)**						
Eastbound Greenbag Rd	Left Turn						
	Through						
	Right Turn						
Westbound Greenbag Rd	Left Turn						
	Through						
	Right Turn						
Northbound Kingwood Pike	Left Turn						
	Through						
	Right Turn						
Southbound Dorsey Ave	Left Turn						
	Through						
	Right Turn						
Intersection:	**Greenbag Road (CR 857) & Luckey Lane**						
Mainline Volume	**EB/WB Total**	**890**	**968**	**588**	**1200**	**1304**	**793**
Side Street	SB Left	44	55	44	59	74	59
	SB Right	0	2	1	0	3	1
	SB Total	44	57	45	59	77	60
	=0.7*SB	30.8	39.9	31.5	41.3	53.9	42
	=0.35*SB	15.4	19.95	15.75	20.65	26.95	21
	RT Red.	20%	20%	20%	20%	20%	20%
Side Street Volume	**SB Total w Red.**	**44**	**57**	**45**	**59**	**76**	**60**

Peak Hour Signal Warrant Volume Development

Approach	Movement	2018 Existing Conditions (BALANCED)			Forecasted 2048 Design Year (2018 Existing Yr Bal + 30 Yrs)[2]		
		Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
		Volume	Volume	Volume	Growth Rate =	1.16%	Per Year, Linear
Intersection:	**Greenbag Road (CR 857) & Richard Avenue**						
Mainline Volume	**EB/WB Total**	**922**	**1010**	**635**	**1243**	**1362**	**855**
Side Street	SB Left	34	19	7	46	26	9
	SB Right	63	23	7	85	31	9
	SB Total	97	42	14	131	57	18
	=0.7*SB	67.9	29.4	9.8	91.7	39.9	12.6
	=0.35*SB	33.95	14.7	4.9	45.85	19.95	6.3
	RT Red.	30%	30%	30%	30%	30%	30%
Side Street Volume	**SB Total w Red.**	**78**	**35**	**12**	**106**	**48**	**15**
Intersection:	**Greenbag Road (CR 857) & Lower Aarons Creek Road (CR 64)**						
Mainline Volume	**EB/WB Total**	**850**	**988**	**621**	**1146**	**1332**	**837**
Side Street	NB Left	17	8	3	23	11	4
	NB Right	16	12	17	22	16	23
	NB Total	33	20	20	45	27	27
	=0.7*NB	23.1	14	14	31.5	18.9	18.9
	=0.35*NB	11.55	7	7	15.75	9.45	9.45
	RT Red.	30%	30%	60%	30%	30%	60%
Side Street Volume	**NB Total w Red.**	**28**	**16**	**10**	**38**	**22**	**13**
Intersection:	**Greenbag Road (CR 857) & Diamond Avenue**						
Mainline Volume	**NB/SB Total**	**793**	**928**	**589**	**1069**	**1251**	**794**
Side Street	WB Left	76	65	40	102	88	54
	WB Right	5	4	3	7	5	4
	WB Total	81	69	43	109	93	58
	=0.7*WB	56.7	48.3	30.1	76.3	65.1	40.6
	=0.35*WB	28.35	24.15	15.05	38.15	32.55	20.3
	RT Red.	20%	20%	20%	20%	20%	20%
Side Street Volume	**WB Total w Red.**	**80**	**68**	**42**	**108**	**92**	**57**

(1) Percent right turn volume of the side street approach calculated to determine the reduction of right turns per Pagones Theorem.

Pagones Theorem for a single-lane shared left (L)/through (T)/right(R) approach (A):

if	Condition	Right Turn Reduction
	R > 0.7A	Reduce R by 60%
	0.7A >= R > 0.35A	Reduce R by 30%
	R <0.35A	Reduce R by 20%

Peak Hour Signal Warrant Volume Development

Approach	Movement	Forecasted 2048 Design Year With Luckey Lane Terminated at Greenbag Road			Forecasted 2048 Design Year (2018 Existing Yr Bal + 30 Yrs)[2]		
		Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Peak Hour
		Volume	Volume	Volume	Growth Rate =	1.16%	Per Year, Linear
Intersection:	**Greenbag Road (CR 857) & Richard Avenue**						
Mainline Volume	**EB/WB Total**	**1240**	**1358**	**852**	**0**	**0**	**0**
Side Street	SB Left	49	30	12	0	0	0
	SB Right	85	31	9	0	0	0
	SB Total	134	61	21	0	0	0
	=0.7*SB	93.8	42.7	14.7	0	0	0
	=0.35*SB	46.9	21.35	7.35	0	0	0
	RT Red.	30%	30%	30%	30%	30%	30%
Side Street Volume	**SB Total w Red.**	**109**	**52**	**18**	**0**	**0**	**0**

TIME	2018 Existing TMC Data						2048 Design Year Volumes	
	Mainline Total	Site Street Left	Side Street Right	Side Street Total WO Reduction	% Right Turn Reduction Per Pagones Theorem	Site Street Total With Reduction	Mainline Total	Side Street Total w Right Turn Red.
Intersection:	**Greenbag Road & Mississippi Avenue (October 2018 Data)**							
7:00 to 8:00 AM	924	107	104	211	30%	180	1246	243
8:00 to 9:00 AM	683	30	46	76	30%	62	921	84
3:00 to 4:00 PM	936	84	70	154	30%	133	1262	179
4:00 to 5:00 PM	1084	45	62	107	30%	88	1461	119
5:00 to 6:00 PM	1055	51	67	118	30%	98	1422	132
Intersection:	**Greenbag Road & Mississippi Avenue (January 2019 Data)**							
7:00 to 8:00 AM	868	94	103	197	30%	166	1160	222
8:00 to 9:00 AM	616	39	42	81	30%	68	823	91
9:00 to 10:00 AM	523	23	33	56	30%	46	699	61
10:00 to 11:00 AM	586	38	31	69	30%	60	783	80
11:00 to 12:00 PM	562	62	43	105	30%	92	751	123
12:00 to 1:00 PM	601	32	50	82	30%	67	803	90
1:00 to 2:00 PM	636	33	37	70	30%	59	850	79
2:00 to 3:00 PM	719	110	108	218	30%	186	961	249
3:00 to 4:00 PM	792	59	58	117	30%	100	1058	134
4:00 to 5:00 PM	931	38	60	98	30%	80	1244	107
5:00 to 6:00 PM	877	27	34	61	30%	51	1172	68
6:00 to 7:00 PM	525	26	27	53	30%	45	702	60
Intersection:	**Greenbag Road & Luckey Lane**							
7:00 to 8:00 AM	865	45	0	45	20%	45	1166	61
8:00 to 9:00 AM	780	41	0	41	20%	41	1051	55
3:00 to 4:00 PM	897	46	1	47	20%	47	1209	63
4:00 to 5:00 PM	922	55	1	56	20%	56	1243	75
5:00 to 6:00 PM	928	48	1	49	20%	49	1251	66

TIME	2018 Existing TMC Data						2048 Design Year Volumes	
	Mainline Total	Site Street Left	Side Street Right	Side Street Total WO Reduction	% Right Turn Reduction Per Pagones Theorem	Site Street Total With Reduction	Mainline Total	Side Street Total w Right Turn Red.
Intersection:	**Greenbag Road & Richard Avenue**							
7:00 to 8:00 AM	938	6	5	11	30%	10	1264	13
8:00 to 9:00 AM	784	38	71	109	30%	88	1057	119
3:00 to 4:00 PM	923	47	38	85	30%	74	1244	100
4:00 to 5:00 PM	965	12	17	29	30%	24	1301	32
5:00 to 6:00 PM	956	22	31	53	30%	44	1289	59
Intersection:	**Greenbag Road & Lower Aarons Creek Road**							
7:00 to 8:00 AM	834	20	16	36	30%	31	1124	42
8:00 to 9:00 AM	713	6	22	28	60%	15	961	20
3:00 to 4:00 PM	938	9	12	21	30%	17	1264	23
4:00 to 5:00 PM	950	15	9	24	30%	21	1281	28
5:00 to 6:00 PM	905	9	10	19	30%	16	1220	22
Intersection:	**Greenbag Road & Diamond Avenue**							
7:00 to 8:00 AM	737	85	1	86	20%	86	993	116
8:00 to 9:00 AM	705	57	7	64	20%	63	950	85
3:00 to 4:00 PM	876	71	6	77	20%	76	1181	102
4:00 to 5:00 PM	888	54	8	62	20%	60	1197	81
5:00 to 6:00 PM	887	51	8	59	20%	57	1196	77

growth rate	1.16%
Number Yrs=	30
growth Factor=	1.348
growth rate	1.16%
Number Yrs=	29
growth Factor=	1.3364

STAHL SHEAFFER ENGINEERING

Stahl Sheaffer Engineering, LLC
400 Allen Drive, Suite 100
Charleston, WV 25302
681.265.3842
www.sse-llc.com

April 29, 2019

Mr. Donald Meadows
West Virginia Division of Highways
Traffic Engineering - Operations
Building 5, Room A-550
1900 Kanawha Blvd. E.
Charleston, WV 25305

TRANSMITTAL VIA E-MAIL ONLY

RE: Traffic Analysis Supplement
Greenbag Road PIE Traffic Study
City of Morgantown, Monongalia County, WV

Dear Mr. Meadows:

Stahl Sheaffer Engineering, LLC (Stahl Sheaffer) has prepared this traffic analysis supplement to the *Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study*, dated Revised February 2019 (February 2019 Study), to provide updated traffic analyses for the intersections of Greenbag Road (CR 857) at Mississippi Avenue and Greenbag Road (CR 857) at Dorsey Avenue/Kingwood Pike (CR 81). Since submission of the February 2019 Study, the roundabout design at the two (2) proposed locations have been modified to incorporate feedback and direction from representatives at the West Virginia Department of Highways (WVDOH).

The traffic analysis included in this supplement summarizes the results of the capacity and queue analyses completed for the following forecasted conditions and improvement option(s) during both the weekday AM and weekday PM peak hours:

- Greenbag Road (CR 857) and Mississippi Avenue
  - 2048 Design Year Condition Without Improvements
  - 2048 Design Year Condition With Proposed Traffic Signal Improvement
  - 2048 Design Year Condition With Proposed Roundabout Improvement - with Eastbound Left Turn Lane
  - 2048 Design Year Condition With Proposed Roundabout Improvement - with Eastbound Left Turn Lane and Westbound Right Turn Lane
- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)
  - 2048 Design Year Condition Without Improvements
  - 2048 Design Year Condition With Proposed Traffic Signal Improvement - with Left Turn Lanes on All Approaches
  - 2048 Design Year Condition With Proposed Traffic Signal Improvement – with Left Turn and Right Turn Lanes on All Approaches
  - 2048 Design Year Condition with Proposed Roundabout Improvement – with Eastbound Left Turn Lane

The capacity analyses were performed utilizing *Synchro* software, for unsignalized and signalized intersections, and *SIDRA INTERSECTION 8.0* software, for roundabouts, both based on the methodologies published in the *Highway Capacity Manual 6th Edition*, by the Transportation Research Board (HCM 6th Edition). The capacity analysis methodologies determine how well an intersection, approach to an intersection, or movement at an intersection operates, and assigns to it a level of service (LOS) A through F, with LOS A representing the best operating conditions and LOS F, the worst.

Level of service criteria for unsignalized and signalized (roundabout) intersections is summarized below:

HCM 6th Edition Level of Service Criteria		
Level of Service	**Average Control Delay (Seconds/Vehicle)**	
	Unsignalized Intersections	**Signalized (Roundabout) Intersections**
A	0 – 10	≤10
B	>10 – 15	>10 – 20
C	>15 – 25	> 20 – 35
D	>25 – 35	> 35 – 55
E	>35 – 50	>55 – 80
F	>50	>80

The queue analyses were performed using *Synchro* software, for unsignalized and signalized intersections, and *SIDRA INTERSECTION 8.0* software, for roundabouts, both reporting the 95th percentile queue length per movement, in feet.

Results of the capacity analysis and queue analysis conducted for the conditions and peak hours listed above are summarized on Table 1 and Table 2, respectively, and are included with this correspondence.

The following sections of this correspondence details the traffic analyses completed for each intersection, condition, and peak hour.

Greenbag Road (CR 857) and Mississippi Avenue

2048 Design Year Without Improvements: The intersection of Greenbag Road (CR 857) and Mississippi Avenue is a T-intersection that currently operates as two-way stop controlled (TWSC), with a stop sign on the southbound Mississippi Avenue approach and free-flowing on Greenbag Road. All approaches to this intersection currently provide a single lane to accommodate all applicable movements. An aerial image of the existing intersection conditions is presented in Exhibit 1.



Exhibit 1: Existing Conditions

Traffic analyses, which includes capacity analysis and queue analysis, were completed at this intersection for 2048 design year conditions without improvements during the weekday AM and weekday PM peak hours. The analysis of 2048 design year without development conditions provides a baseline intersection operation to compare to the potential improvement options operation.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Mississippi Avenue, without improvements, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	A	A
Westbound Greenbag Road	A	A
Southbound Mississippi Avenue	F	F
Overall Intersection	**F**	**D**

The results of the queue analyses indicate that the intersection of Greenbag Road (CR 857) Mississippi Avenue, without improvements, is anticipated to queue as follows:

Approach	Queue Length (Feet)	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	23’	23’
Westbound Greenbag Road	0’	0’
Southbound Dorsey Avenue	#748’	#288’

Note: # Denotes the movement volume-to-capacity ratio is greater than 1.00, and queues may extend longer than the reported length.

A summary of the capacity analysis and queue analysis results for the 2048 design year condition without improvements for the weekday AM and weekday PM peak hours at the intersection of Greenbag Road (CR 857) and Mississippi Avenue are presented on Table 1, provided with this correspondence.

Printouts of the Synchro analyses are included with this correspondence.

Greenbag Road (CR 857) and Mississippi Avenue

2048 Design Year With Traffic Signal Improvement: The proposed traffic signal improvement option at the intersection Greenbag Road (CR 857) and Mississippi Avenue includes the following improvements, as presented the *Synchro* software concept layout in Exhibit 2:

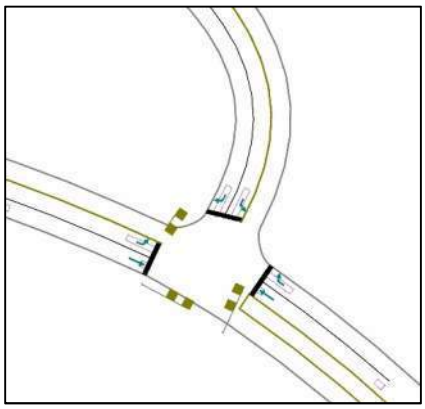


Exhibit 2: Traffic Signal

- Widen the eastbound Greenbag Road approach to provide an exclusive left turn lane and an exclusive through lane.
- Widen the westbound Greenbag Road approach to provide an exclusive through lane and an exclusive right turn lane.
- Widen the southbound Mississippi Avenue approach to provide an exclusive left turn lane and an exclusive right turn lane.
- Install traffic signal control, to provide three (3) phases:
  - A protected eastbound advance phase with a southbound right turn overlap.
  - A permissive eastbound/westbound phase.
  - A protected southbound left turn phase with a westbound right turn overlap.
- Traffic signal control to operate as fully actuated, uncoordinated.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Mississippi Avenue, with installation of a traffic signal and roadway improvements as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	A	A
Westbound Greenbag Road	B	B
Southbound Mississippi Avenue	C	B
Overall Intersection	**B**	**A**

The results of the queue analyses indicate that proposed turn lanes would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	225’	375’	600’
Westbound Right Turn Lane Greenbag Road	325’	320’	645’
Southbound Left/Right Turn Lane Mississippi Avenue	200’	245’	445’

The turn lane storage lengths listed above are required to accommodate the back of queue from the through movements along Greenbag Road and Mississippi Avenue.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with the proposed traffic signal improvements, as detailed above, for the intersection of Greenbag Road (CR 857) and Mississippi Avenue are presented on Table 1, provided with this correspondence.

Printouts of the Synchro analyses are included with this correspondence.

Greenbag Road (CR 857) and Mississippi Avenue

2048 Design Year With Roundabout Improvement - With Eastbound Left Turn Lane: The proposed roundabout improvement option at the intersection Greenbag Road (CR 857) and Mississippi Avenue includes the following design elements, as presented in the *SIDRA INTERSECTION 8.0* concept layout in Exhibit 3:

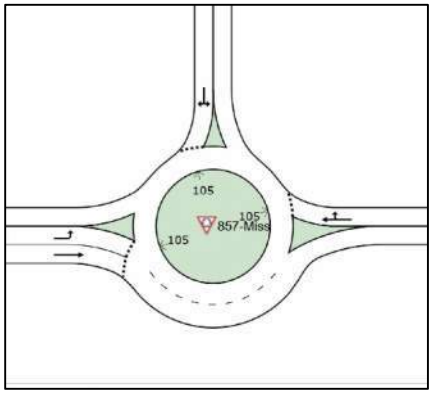


Exhibit 3: Roundabout

- The Greenbag Road/Mississippi Avenue roundabout provides one (1) circulating lane on the northern hemisphere and two (2) circulating lanes on the southern hemisphere, with an island diameter of approximately 105 feet.
- Eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and an exclusive through lane.
- Westbound Greenbag Road approach provides one (1) lane for the shared through/right turn movement.
- Southbound Mississippi Avenue approach provides one (1) lane for the shared left turn/right turn movements.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Mississippi Avenue, with installation of the proposed roundabout and roadway improvement as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	A	A
Westbound Greenbag Road	C	B
Southbound Mississippi Avenue	B	A
Overall Intersection	**B**	**A**

The results of the queue analyses indicate that proposed eastbound left turn lane would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	125’	375’	500’

The eastbound left turn lane storage length listed above will accommodate the back of queue from the eastbound through movement on Greenbag Road.

It should be noted that the westbound shared through/right turn movement on Greenbag Road is forecasted to queue approximately 618 feet during the weekday AM peak hour and 208 feet during the weekday PM peak hour. This queue is not forecasted to extend beyond any adjacent driveways or intersections.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with proposed roundabout and roadway improvements, as detailed above, for the intersection of Greenbag Road (CR 857) and Mississippi Avenue are presented on Table 1, provided with this correspondence.

Printouts of the SIDRA INTERSECTION 8.0 analyses are included with this correspondence.

Greenbag Road (CR 857) and Mississippi Avenue

2048 Design Year With Roundabout Improvement - With Eastbound Left Turn Lane and Westbound Right Turn Lane: The proposed roundabout improvement option at the intersection Greenbag Road (CR 857) and Mississippi Avenue includes the following design elements, as presented in the *SIDRA INTERSECTION 8.0* concept layout in Exhibit 4:

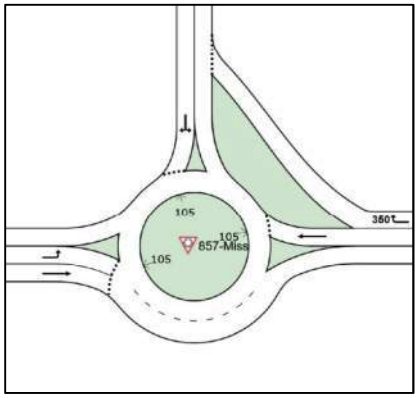


Exhibit 4: Roundabout

- The Greenbag Road/Mississippi Avenue roundabout provides one (1) circulating lane on the northern hemisphere and two (2) circulating lanes on the southern hemisphere, with an island diameter of approximately 105 feet.
- Eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and an exclusive through lane.
- Westbound Greenbag Road approach provides two (2) lanes, an exclusive through lane and an exclusive by-pass right turn lane.
- Southbound Mississippi Avenue approach provides one (1) lane for the shared left turn/right turn movements.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Mississippi Avenue, with installation of the proposed roundabout and roadway improvements, as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	A	A
Westbound Greenbag Road	A	A
Southbound Mississippi Avenue	B	A
Overall Intersection	**A**	**A**

The results of the queue analyses indicate that proposed turn lanes would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	125’	375’	500’
Westbound Right Turn Lane Greenbag Road	100’	320’	420’

The turn lane storage lengths listed above will accommodate the back of queue from the through movements on Greenbag Road.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with proposed roundabout and roadway improvements, as detailed above, for the intersection of Greenbag Road (CR 857) and Mississippi Avenue are presented on Table 1, provided with this correspondence.

Printouts of the SIDRA INTERSECTION 8.0 analyses are included with this correspondence.

Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)



Exhibit 5: Existing Conditions

2048 Design Year Without Improvements: The intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) is a four (4) leg intersection, currently controlled by a two-phase, fully actuated, traffic signal. All approaches to this intersection currently provide a single lane to accommodate all movements. An aerial image of the existing intersection conditions is presented in Exhibit 5.

Traffic analyses, which includes capacity analysis and queue analysis, were completed at this intersection for 2048 design year conditions without improvements during the weekday AM and weekday PM peak hours. The analysis of 2048 design year without development conditions provides a baseline intersection operation to compare to the potential improvement options operation.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), without improvements, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	C	F
Westbound Greenbag Road	C	E
Northbound Kingwood Pike	E	C
Southbound Dorsey Avenue	C	E
Overall Intersection	**C**	**F**

The results of the queue analyses indicate that the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), is anticipated to queue as follows:

Approach	Queue Length (Feet)	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	370’	#954’
Westbound Greenbag Road	378’	#634’
Northbound Kingwood Pike	#643’	168’
Southbound Dorsey Avenue	196’	#535’

Note: # Denotes the movement volume-to-capacity ratio is greater than 1.00, and queues may extend longer than the reported length.

A detailed summary of the capacity analysis and queue analysis results for the 2048 design year condition without improvements for the weekday AM and weekday PM peak hours at the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) are presented on Table 2, provided with this correspondence.

Printouts of the Synchro analyses are included with this correspondence.

Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)

2048 Design Year Traffic Signal Improvement - with Left Turn Lanes on All Improvements: The proposed traffic signal improvement option at the intersection Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) includes the following improvements, as presented the *Synchro* software concept layout in Exhibit 6:

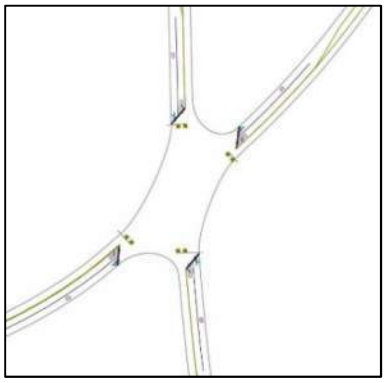


Exhibit 6: Traffic Signal

- Widen all approaches to provide an exclusive left turn lane and a shared through/right turn lane.
- Modify traffic signal control, to provide four (4) phases:
  - A protected eastbound/westbound left turn phase.
  - A permissive eastbound/westbound phase.
  - A protected northbound/southbound left turn phase.
  - A permissive northbound/southbound phase.
- Traffic signal control to operate as fully actuated, uncoordinated.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), with proposed traffic signal and roadway improvements as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	C	E
Westbound Greenbag Road	D	C
Northbound Kingwood Pike	D	D
Southbound Dorsey Avenue	C	F
Overall Intersection	**C**	**E**

The results of the queue analyses indicate that proposed turn lanes would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	825’	375’	1,200’
Westbound Left Turn Lane Greenbag Road	550’	375’	925’
Northbound Left Turn Lane Kingwood Pike	425’	540’	965’
Southbound Left Turn Lane Dorsey Avenue	500’	245’	745’

The turn lane storage lengths listed above will accommodate the back of queue from the through movements along Greenbag Road, Dorsey Avenue, and Kingwood Pike.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with traffic signal and roadway improvements, as detailed above, for the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) are presented on Table 2, provided with this correspondence.

Printouts of the Synchro analyses are included with this correspondence.

Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)

2048 Design Year Traffic Signal Improvement - with Left Turn and Right Turn Lanes on All Approaches: The proposed traffic signal improvement option at the intersection Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) includes the following improvements, as presented the *Synchro* software concept layout in Exhibit 7.

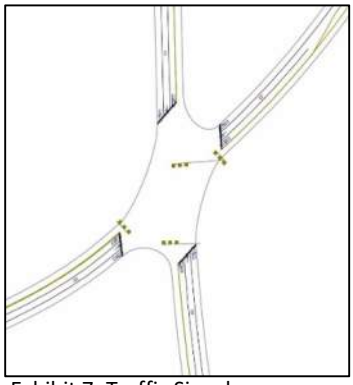


Exhibit 7: Traffic Signal

- Widen all approaches to provide an exclusive left turn lane, exclusive through lane, and an exclusive right turn lane.
- Modify traffic signal control, to provide four (4) phases:
  - A protected eastbound/westbound left turn phase with a northbound/southbound right turn overlap.
  - A permissive eastbound/westbound phase.
  - A protected northbound/southbound left turn phase with an eastbound/westbound right turn overlap.
  - A permissive northbound/southbound phase.
- Traffic signal control to operate as fully actuated, uncoordinated.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), with proposed traffic signal and roadway improvements as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	C	C
Westbound Greenbag Road	C	B
Northbound Kingwood Pike	C	C
Southbound Dorsey Avenue	C	C
Overall Intersection	**C**	**C**

The results of the queue analyses indicate that proposed turn lanes would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

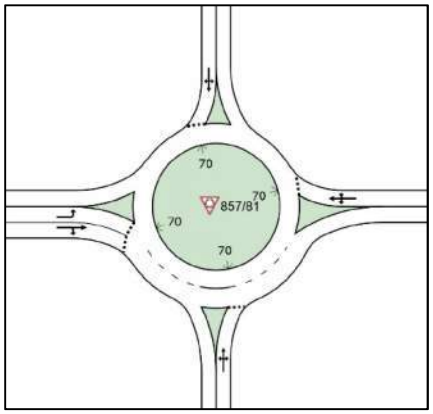
Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	475’	375’	850’
Eastbound Right Turn Lane Greenbag Road	475’	375’	850’
Westbound Left Turn Lane Greenbag Road	450’	375’	825’
Westbound Right Turn Lane Greenbag Road	450’	375’	825’
Northbound Left Turn Lane Kingwood Pike	225’	540’	765’
Northbound Right Turn Lane Greenbag Road	225’	540’	765’
Southbound Left Turn Lane Dorsey Avenue	250’	245’	495’
Southbound Right Turn Lane Greenbag Road	250’	245’	495’

The turn lane storage lengths listed above will accommodate the back of queue from the through movements along Greenbag Road, Dorsey Avenue, and Kingwood Pike.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with traffic signal and roadway improvements, as detailed above, at the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) are presented on Table 2, provided with this correspondence. Printouts of the Synchro analyses are included with this correspondence.

Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81)

2048 Design Year With Roundabout Improvement – with Eastbound Left Turn Lane: The proposed roundabout improvement option at the intersection Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) includes the following design elements, as presented in the *SIDRA INTERSECTION 8.0* concept layout in Exhibit 8:



- The Greenbag Road/Dorsey Avenue/Kingwood Pike roundabout provides one (1) circulating lane on the northern hemisphere and two (2) circulating lanes on the southern, with an island diameter of approximately 70 feet.
- Eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.
- Westbound Greenbag Road approach provides one (1) lane for the shared left turn/through/right turn movement.
- Northbound Kingwood Pike approach provides one (1) lane for the shared left turn/through/right turn movement.
- Southbound Dorsey Avenue approach provides one (1) lane for the shared left turn/through/right turn movement.

The results of the capacity analyses indicate that the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81), with proposed roundabout improvement as detailed above, is forecasted to operate as follows:

Approach	Level of Service	
	AM Peak Hour	PM Peak Hour
Eastbound Greenbag Road	A	C
Westbound Greenbag Road	C	B
Northbound Kingwood Pike	B	B
Southbound Dorsey Avenue	B	C
Overall Intersection	**B**	**C**

The results of the queue analyses indicate that proposed eastbound left turn lane would need to provide the following vehicular storage capacity to accommodate the forecasted queue lengths:

Turn Lane	Required Turn Lane Storage (Feet)		
	Vehicular Storage Length	Taper Length	Total Length
Eastbound Left Turn Lane Greenbag Road	450’	375’	825’

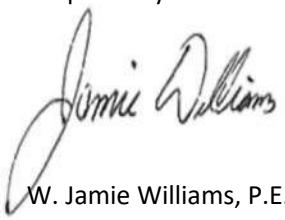
The turn lane storage length listed above will accommodate the back of queue from the eastbound through movement on Greenbag Road.

A summary of the capacity analysis and queue analysis for the 2048 design year condition with roundabout improvement, as detailed above, for the intersection of Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) are presented on Table 2, provided with this correspondence.

Printouts of the SIDRA INTERSECTION 8.0 analyses are included with this correspondence.

This concludes Stahl Sheaffer's traffic analysis supplement for the intersections of Greenbag Road (CR 857) with Mississippi Avenue and Greenbag Road (CR 857) with Dorsey Avenue/Kingwood Pike (CR 81). If you have any questions, feel free to call or e-mail jwilliams@sse-llc.com.

Respectfully Submitted,

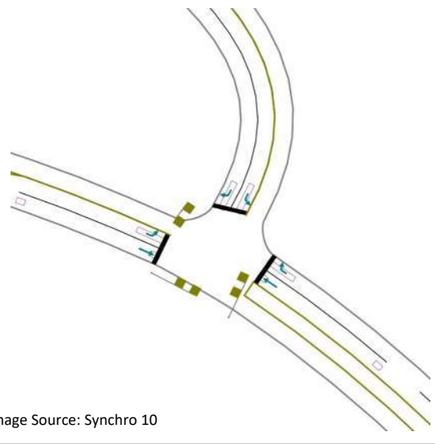
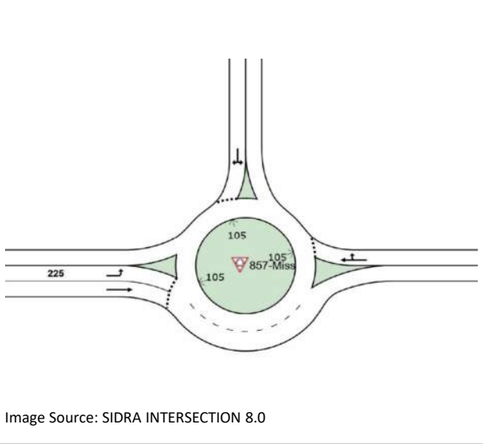
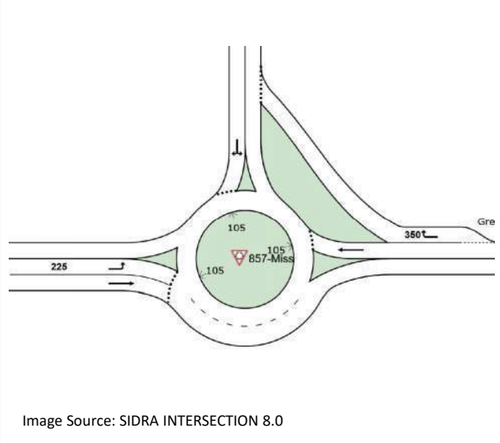


W. Jamie Williams, P.E.
Senior Project Manager, Stahl Sheaffer Engineering, LLC

ENCLOSURES – TABLES, ANALYSIS PRINTOUTS, ELECTRONIC FILES

cc: (all via e-mail only)
18-141/Project File

TABLE 1
ANALYSIS COMPARISON SUMMARY
GREENBAG ROAD (CR 857) AND MISSISSIPPI AVENUE
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Approach *Roadway*	Movement	Analysis Comparison Summary HCM 6th Edition Level of Service (Delay in Seconds)[1] and 95th Percentile Queue Length (Feet)[2]															
		2048 Design Year Conditions Without Improvements[3]				2048 Design Year Conditions With Improvement Options											
						Traffic Signal[4]				Roundabout[5]				Roundabout[6]			
		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE
Greenbag Road (CR 857) & Mississippi Avenue																	
Eastbound *Greenbag Road*	Left Turn	A (3.5)	23'	A (2.3)	23'	B (11.1)	37'	A (8.8)	47'	A (4.5)	17'	A (4.0)	17'	A (4.5)	17'	A (4.0)	17'
	Through					A (4.7)	81'	A (5.4)	213'	A (6.2)	42'	A (8.5)	105'	A (6.2)	42'	A (8.5)	105'
	Approach	A (3.5)	--	A (2.3)	--	A (6.7)	--	A (6.2)	--	A (5.7)	--	A (7.5)	--	A (5.7)	--	A (7.5)	--
Westbound *Greenbag Road*	Through	A (0.0)	0'	A (0.0)	0'	B (15.2)	325'	B (13.5)	291'	C (21.1)	618'	B (12.7)	208'	A (4.5)	96'	A (8.1)	71'
	Right Turn					B (10.8)	27'	A (6.6)	16'					A (6.2)	27'	A (4.5)	18'
	Approach	A (0.0)	--	A (0.0)	--	B (13.9)	--	B (11.7)	--	C (21.1)	--	B (12.7)	--	A (5.7)	--	A (7.2)	--
Southbound *Mississippi Ave*	Left Turn	#F (826.4)	#748'	#F (330.1)	#288'	C (28.8)	200'	B (19.3)	60'	B (15.5)	95'	A (6.8)	22'	B (15.5)	95'	A (6.8)	22'
	Right Turn					B (19.5)	38'	B (15.5)	29'								
	Approach	#F (826.4)	--	#F (330.1)	--	C (24.2)	--	B (16.9)	--	B (15.5)	--	A (6.8)	--	B (15.5)	--	A (6.8)	--
Overall Intersection		**F (154.5)**	**--**	**D (30.0)**	**--**	**B (13.6)**	**--**	**A (9.3)**	**--**	**B (15.3)**	**--**	**A (9.6)**	**--**	**A (8.9)**	**--**	**A (7.3)**	**--**
Intersection Schematic		 Image Source: Google Earth		 Image Source: Synchro 10		 Image Source: SIDRA INTERSECTION 8.0		 Image Source: SIDRA INTERSECTION 8.0					

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 6th Edition* , by the Transportation Research Board, utilizing Synchro 10 for the existing and proposed signalized intersection operation and SIDRA INTERSECTION 8.0 for the proposed roundabout option. SIDRA intersection reports delay in seconds, based on the level of service scale for signalized intersections.

(2) For the existing and proposed traffic signal, Synchro 95th percentile queue length is reported, in feet. For the proposed roundabout, queue length analysis utilized SIDRA INTERSECTION 8.0, reporting the 95th percentile queue length, in feet.

(3) The existing lane configuration includes a single lane approach on all approaches accommodating all movements. The intersection currently operates as a two-way stop controlled intersection, with a stop sign on the southbound Mississippi Avenue approach and Greenbag Road is free-flowing.

(4) Traffic Signal. The proposed roadway configuration includes an exclusive left turn lane and an exclusive through lane on the eastbound Greenbag Road approach, an exclusive through lane and an exclusive right turn lane on the westbound Greenbag Road approach, and an exclusive left turn lane and an exclusive right turn lane on the southbound Mississippi Avenue approach. The proposed signal is anticipated to operate as 3-phases, which includes an advance eastbound phase with a southbound right turn overlap, a permissive eastbound/westbound phase, and a southbound protected phase.

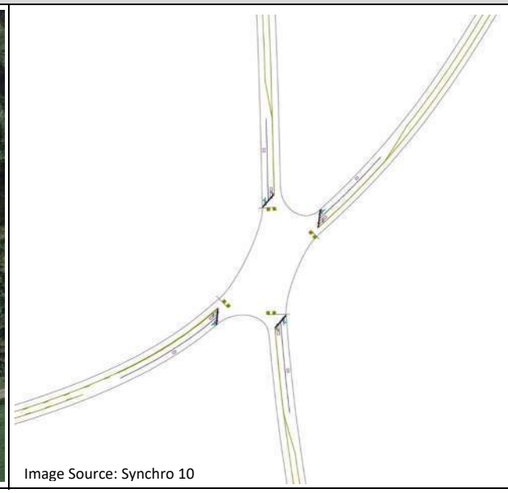
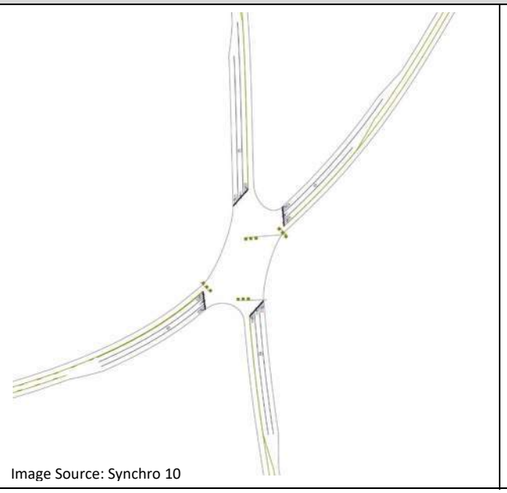
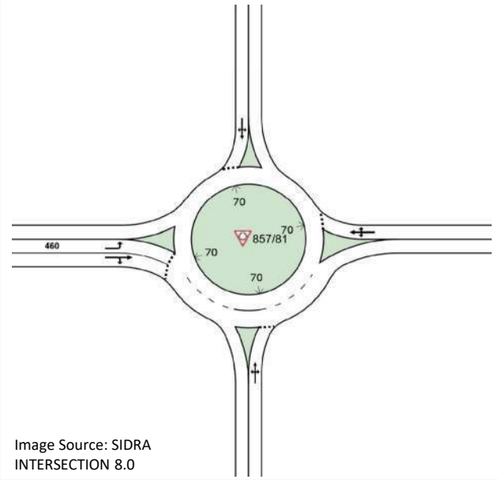
(5) Roundabout. Includes a roundabout that provides one (1) circulating lane on the northern portion and two (2) lane circulating lanes on the southern portion. The eastbound Greenbag Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach and southbound Mississippi Avenue approach both provide a single lane for all movements.

(6) Roundabout. Includes a roundabout that provides one (1) circulating lane on the northern portion and two (2) lane circulating lanes on the southern portion. The eastbound Greenbag Road approach provides an exclusive left turn lane and an exclusive through lane. The westbound Greenbag Road approach provides an exclusive through lane and an exclusive by-pass right turn lane. The southbound Mississippi Avenue approach provides a single lane for all movements.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

Source: Analysis by Stahl Sheaffer Engineering, LLC.

TABLE 2
ANALYSIS COMPARISON SUMMARY
GREENBAG ROAD (CR 857) AND DORSEY AVENUE/KINGWOOD PIKE (CR 81)
Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study
City of Morgantown, Monongalia County, West Virginia

Approach *Roadway*	Movement	Analysis Comparison Summary HCM 6th Edition Level of Service (Delay in Seconds)[1] and 95th Percentile Queue Length (Feet)[2]															
		2048 Design Year Conditions Without Improvements				2048 Design Year Conditions With Improvement Options											
						Traffic Signal[3] All Approaches: Exclusive Left Turn Lane and Shared Through/Right Turn Lane				Traffic Signal[4] All Approaches: Exclusive Left Turn Lane, Exclusive Through Lane and Exclusive Right Turn Lane				Roundabout[5]			
		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE	LOS	QUEUE
Greenbag Road (CR 857) & Dorsey Avenue/Kingwood Pike (CR 81)																	
Eastbound *Greenbag Road*	Left Turn	C (24.7)	370'	#F (304.3)	#954'	B (19.2)	47'	B (19.8)	97'	B (17.1)	41'	B (15.3)	76'	A (3.7)	7'	A (5.9)	19'
	Through					C (31.0)	387'	#F (75.0)	#811'	C (22.0)	281'	C (32.9)	466'	A (7.2)	52'	C (27.2)	433'
	Right Turn									B (10.4)	0'	B (13.6)	26'				
	Approach	C (24.7)	--	#F (304.3)	--	C (29.3)	--	E (65.1)	--	C (20.4)	--	C (26.2)	--	A (6.5)	--	C (23.4)	--
Westbound *Greenbag Road*	Left Turn	C (20.5)	378'	#E (64.1)	#634'	B (17.9)	26'	D (49.1)	143'	B (15.9)	23'	B (18.9)	62'	C (20.7)	252'	B (13.7)	210'
	Through					D (37.3)	531'	C (26.9)	438'	C (27.1)	442'	C (21.0)	312'				
	Right Turn									B (12.9)	0'	B (10.7)	0'				
	Approach	C (20.5)	--	#E (64.1)	--	D (36.2)	--	C (31.5)	--	C (25.9)	--	B (20.0)	--	C (20.7)	--	B (13.7)	--
Northbound *Kingwood Pike*	Left Turn	#E (59.0)	#643'	C (23.2)	168'	C (22.0)	134'	D (39.8)	77'	C (20.8)	147'	C (27.9)	64'	B (18.7)	220'	B (10.9)	44'
	Through					D (42.3)	408'	D (41.1)	151'	C (25.0)	225'	C (31.2)	89'				
	Right Turn									C (22.9)	46'	C (26.4)	15'				
	Approach	#E (59.0)	--	C (23.2)	--	D (35.5)	--	D (40.7)	--	C (22.9)	--	C (28.7)	--	B (18.7)	--	B (10.9)	--
Southbound *Dorsey Avenue*	Left Turn	C (29.9)	196'	#E (61.0)	#535'	C (23.9)	66'	C (33.6)	134'	C (22.6)	72'	C (26.0)	110'	B (15.0)	77'	C (28.0)	271'
	Through					C (34.9)	74'	#F (114.3)	#479'	C (24.9)	39'	D (44.8)	236'				
	Right Turn									C (28.3)	44'	C (24.5)	41'				
	Approach	C (29.9)	--	#E (61.0)	--	C (31.4)	--	F (92.4)	--	C (26.1)	--	C (33.7)	--	B (15.0)	--	C (28.0)	--
Overall Intersection		**C (34.9)**	**--**	**F (152.9)**	**--**	**C (33.5)**	**--**	**E (59.8)**	**--**	**C (23.6)**	**--**	**C (26.5)**	**--**	**B (15.6)**	**--**	**C (20.6)**	**--**
Intersection Schematic		 Image Source: Google Earth		 Image Source: Synchro 10		 Image Source: Synchro 10		 Image Source: SIDRA INTERSECTION 8.0									

(1) Capacity calculations performed utilizing methodologies published in the *Highway Capacity Manual 6th Edition* , by the Transportation Research Board, utilizing Synchro 10 for the existing and proposed signalized intersection operation and SIDRA INTERSECTION 8.0 for the proposed roundabout option. SIDRA intersection reports delay in seconds, based on the level of service scale for signalized intersections.

(2) For the existing and proposed traffic signal, Synchro 95th percentile queue length is reported, in feet. For the proposed roundabout, queue length analysis utilized SIDRA INTERSECTION 8.0. The 95th percentile queue length is reported, in feet.

(3) Traffic Signal. Includes an exclusive left turn lane and a shared through/right turn lane on all approaches. Proposed signal is to operate as 4-phases, which includes an eastbound/westbound left turn phase, an eastbound/westbound permissive phase, a northbound/southbound left turn phase, and a northbound/southbound permissive phase.

(4) Traffic Signal. Includes an exclusive left turn lane, an exclusive through lane, and an exclusive right turn lane on all approaches. Proposed signal is to operate as 4-phases, which includes an eastbound/westbound left turn phase, an eastbound/westbound permissive phase, a northbound/southbound left turn phase, and a northbound/southbound permissive phase, as well as right turn overlaps for all right turn movements.

(5) Roundabout. Includes a roundabout that provides one (1) circulating lane on the northern portion and two (2) lane circulating lanes on the southern portion. The northbound Kingwood Pike, southbound Dorsey Avenue, and westbound Greenbag Road all provide a single lane approach for all movements. The eastbound Greenbag Road approach provides two (2) lanes, an exclusive left turn lane and a shared through/right turn lane.

Note: # denotes that the v/c ratio for the reported movement is greater than 1.00.

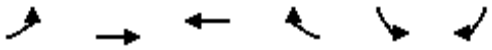
Source: Analysis by Stahl Sheaffer Engineering, LLC.

ENCLOSURE

- 2048 No Build Conditions Capacity and Queue Analyses
- Greenbag Road (CR 857) and Mississippi Avenue Improvement Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane and Westbound Right Turn Lane
- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn and Right Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane

ENCLOSURE

- 2048 No Build Conditions Capacity and Queue Analyses



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962		0.933	
Flt Protected		0.985			0.975	
Satd. Flow (prot)	0	1596	1481	0	1426	0
Flt Permitted		0.985			0.975	
Satd. Flow (perm)	0	1596	1481	0	1426	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	548	901	0	330	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	154.5

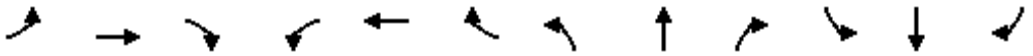
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	324	555	220	144	140
Future Vol, veh/h	147	324	555	220	144	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	171	377	645	256	167	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	901	0	-	0	1492	773
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	742	-	-	-	~ 106	369
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	~ 75	369
Mov Cap-2 Maneuver	-	-	-	-	~ 75	-
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	$ 826.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	124
HCM Lane V/C Ratio	0.23	-	-	-	2.663
HCM Control Delay (s)	11.3	0	-	-	$ 826.4
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	29.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

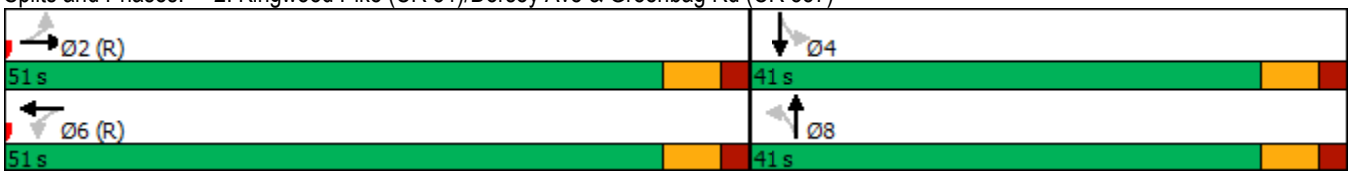


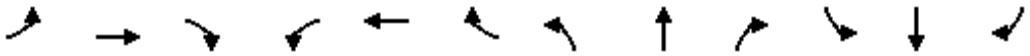
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.995			0.958			0.921	
Flt Protected		0.993			0.997			0.983			0.984	
Satd. Flow (prot)	0	1621	0	0	1726	0	0	1711	0	0	1457	0
Flt Permitted		0.841			0.950			0.755			0.666	
Satd. Flow (perm)	0	1373	0	0	1645	0	0	1314	0	0	986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			3			28			88	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	513	0	0	572	0	0	618	0	0	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.76			0.71			1.20			0.67	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		28.0			24.3			133.2			25.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		28.0			24.3			133.2			25.2	
LOS		C			C			F			C	
Approach Delay		28.0			24.3			133.2			25.2	
Approach LOS		C			C			F			C	
Queue Length 50th (ft)		231			248			~431			95	
Queue Length 95th (ft)		370			378			#643			196	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		674			806			517			429	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.76			0.71			1.20			0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 59.2		Intersection LOS: E	
Intersection Capacity Utilization 97.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

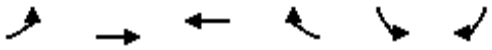




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1584	1584	1584	1874	1874	1874	2160	2160	2160	1611	1611	1611
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	1	1	1	0	0	0
Cap, veh/h	117	548	50	72	818	32	242	214	182	159	61	236
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	148	1121	101	61	1671	66	498	562	478	282	160	619
Grp Volume(v), veh/h	513	0	0	572	0	0	618	0	0	288	0	0
Grp Sat Flow(s),veh/h/ln	1370	0	0	1799	0	0	1539	0	0	1061	0	0
Q Serve(g_s), s	6.4	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	27.5	0.0	0.0	21.1	0.0	0.0	35.0	0.0	0.0	20.2	0.0	0.0
Prop In Lane	0.15		0.07	0.06		0.04	0.34		0.31	0.32		0.58
Lane Grp Cap(c), veh/h	715	0	0	921	0	0	638	0	0	455	0	0
V/C Ratio(X)	0.72	0.00	0.00	0.62	0.00	0.00	0.97	0.00	0.00	0.63	0.00	0.00
Avail Cap(c_a), veh/h	715	0	0	921	0	0	638	0	0	455	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.6	0.0	0.0	17.3	0.0	0.0	30.2	0.0	0.0	23.3	0.0	0.0
Incr Delay (d2), s/veh	6.1	0.0	0.0	3.1	0.0	0.0	28.8	0.0	0.0	6.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	0.0	8.8	0.0	0.0	17.9	0.0	0.0	5.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	0.0	20.5	0.0	0.0	59.0	0.0	0.0	29.9	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	E	A	A	C	A	A
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		24.7			20.5			59.0			29.9	
Approach LOS		C			C			E			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0				
Max Q Clear Time (g_c+I1), s		29.5		22.2		23.1		37.0				
Green Ext Time (p_c), s		3.0		1.5		3.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965		0.915	
Flt Protected		0.989			0.982	
Satd. Flow (prot)	0	1633	1547	0	1603	0
Flt Permitted		0.989			0.982	
Satd. Flow (perm)	0	1633	1547	0	1603	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	923	730	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 112.4%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	30

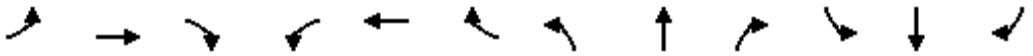
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	670	501	178	55	92
Future Vol, veh/h	189	670	501	178	55	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	203	720	539	191	59	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	730	0	-	0	1761	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	1126	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	879	-	-	-	77	464
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	~ 47	464
Mov Cap-2 Maneuver	-	-	-	-	~ 47	-
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	276	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	$ 330.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	879	-	-	-	107
HCM Lane V/C Ratio	0.231	-	-	-	1.477
HCM Control Delay (s)	10.3	0	-	-	$ 330.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	11.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

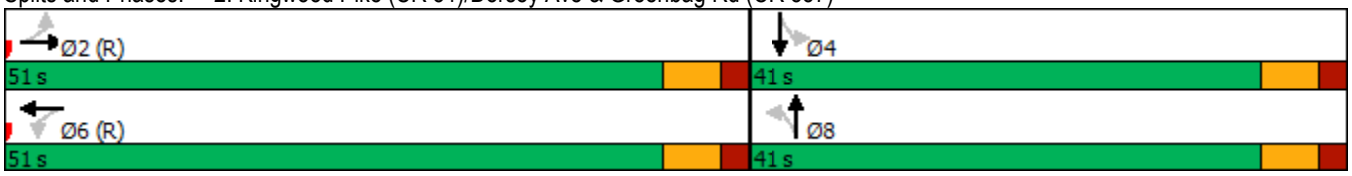


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.993			0.958			0.960	
Flt Protected		0.991			0.990			0.984			0.987	
Satd. Flow (prot)	0	1710	0	0	1810	0	0	1680	0	0	1608	0
Flt Permitted		0.737			0.630			0.674			0.817	
Satd. Flow (perm)	0	1272	0	0	1152	0	0	1150	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			28			26	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	914	0	0	636	0	0	242	0	0	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		1.45			1.13			0.53			1.05	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		235.4			102.6			24.6			82.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		235.4			102.6			24.6			82.4	
LOS		F			F			C			F	
Approach Delay		235.4			102.6			24.6			82.4	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)		~734			~433			95			~342	
Queue Length 95th (ft)		#954			#634			168			#535	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		630			565			454			522	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.45			1.13			0.53			1.05	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 130			
Control Type: Pretimed			
Maximum v/c Ratio: 1.45			
Intersection Signal Delay: 141.6		Intersection LOS: F	
Intersection Capacity Utilization 100.9%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



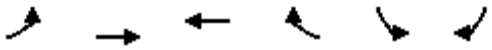
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1964	1964	1964	2130	2130	2130	1611	1611	1611
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	0	0	0
Cap, veh/h	129	345	95	144	450	31	182	207	151	177	236	152
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	170	706	194	198	921	63	341	544	398	335	620	400
Grp Volume(v), veh/h	914	0	0	636	0	0	242	0	0	549	0	0
Grp Sat Flow(s),veh/h/ln	1071	0	0	1182	0	0	1284	0	0	1354	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0
Cycle Q Clear(g_c), s	45.0	0.0	0.0	45.0	0.0	0.0	11.0	0.0	0.0	35.0	0.0	0.0
Prop In Lane	0.18		0.18	0.21		0.05	0.33		0.31	0.27		0.30
Lane Grp Cap(c), veh/h	570	0	0	625	0	0	540	0	0	565	0	0
V/C Ratio(X)	1.60	0.00	0.00	1.02	0.00	0.00	0.45	0.00	0.00	0.97	0.00	0.00
Avail Cap(c_a), veh/h	570	0	0	625	0	0	540	0	0	565	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.5	0.0	0.0	23.7	0.0	0.0	20.5	0.0	0.0	29.5	0.0	0.0
Incr Delay (d2), s/veh	279.8	0.0	0.0	40.4	0.0	0.0	2.7	0.0	0.0	31.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	56.0	0.0	0.0	19.7	0.0	0.0	3.9	0.0	0.0	16.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	304.3	0.0	0.0	64.1	0.0	0.0	23.2	0.0	0.0	61.0	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	C	A	A	E	A	A
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		304.3			64.1			23.2			61.0	
Approach LOS		F			E			C			E	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	51.0	41.0	51.0	41.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	45.0	35.0	45.0	35.0
Max Q Clear Time (g_c+I1), s	47.0	37.0	47.0	13.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4

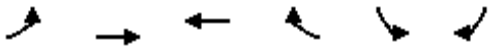
Intersection Summary	
HCM 6th Ctrl Delay	152.9
HCM 6th LOS	F

ENCLOSURE

- Greenbag Road (CR 857) and Mississippi Avenue Improvement Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane and Westbound Right Turn Lane



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1828	1748	1405	1464	1392
Flt Permitted	0.182				0.950	
Satd. Flow (perm)	323	1828	1748	1405	1464	1392
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				256		163
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	377	645	256	167	163
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

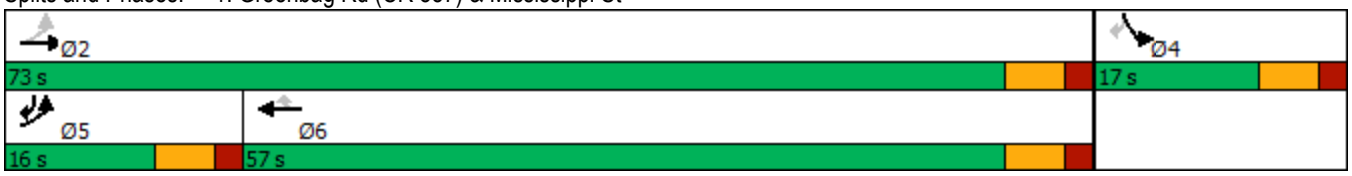


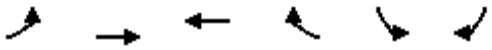
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	24.0	16.0	16.0
Total Split (s)	16.0	73.0	57.0	57.0	17.0	16.0
Total Split (%)	17.8%	81.1%	63.3%	63.3%	18.9%	17.8%
Maximum Green (s)	10.0	67.0	51.0	51.0	11.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	None
Act Effct Green (s)	47.7	47.7	32.1	32.1	11.3	26.9
Actuated g/C Ratio	0.67	0.67	0.45	0.45	0.16	0.38
v/c Ratio	0.43	0.31	0.82	0.33	0.72	0.26
Control Delay	7.3	5.3	26.1	2.6	52.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	5.3	26.1	2.6	52.4	5.1
LOS	A	A	C	A	D	A
Approach Delay		5.9	19.4		29.1	
Approach LOS		A	B		C	
Queue Length 50th (ft)	23	56	235	0	70	0
Queue Length 95th (ft)	37	81	325	27	#200	38
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	412	1671	1281	1098	231	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.23	0.50	0.23	0.72	0.26

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 71.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

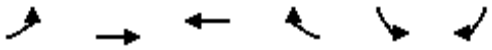




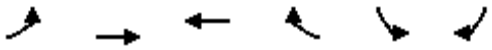
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	324	555	220	144	140
Future Volume (veh/h)	147	324	555	220	144	140
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1943	1988	1817	1728	1610	1713
Adj Flow Rate, veh/h	171	377	645	256	167	163
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	2	4	10	18	11
Cap, veh/h	374	1264	805	649	225	335
Arrive On Green	0.08	0.64	0.44	0.44	0.15	0.15
Sat Flow, veh/h	1850	1988	1817	1465	1533	1452
Grp Volume(v), veh/h	171	377	645	256	167	163
Grp Sat Flow(s),veh/h/ln	1850	1988	1817	1465	1533	1452
Q Serve(g_s), s	2.5	4.7	16.9	6.5	5.8	5.4
Cycle Q Clear(g_c), s	2.5	4.7	16.9	6.5	5.8	5.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	374	1264	805	649	225	335
V/C Ratio(X)	0.46	0.30	0.80	0.39	0.74	0.49
Avail Cap(c_a), veh/h	553	2411	1677	1352	305	411
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	4.5	13.3	10.4	22.6	18.4
Incr Delay (d2), s/veh	0.9	0.1	1.9	0.4	6.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.1	5.6	1.7	2.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.1	4.7	15.2	10.8	28.8	19.5
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h		548	901		330	
Approach Delay, s/veh		6.7	13.9		24.2	
Approach LOS		A	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		41.1		14.1	10.6	30.5
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		67.0		11.0	10.0	51.0
Max Q Clear Time (g_c+I1), s		6.7		7.8	4.5	18.9
Green Ext Time (p_c), s		2.3		0.4	0.2	5.6

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B



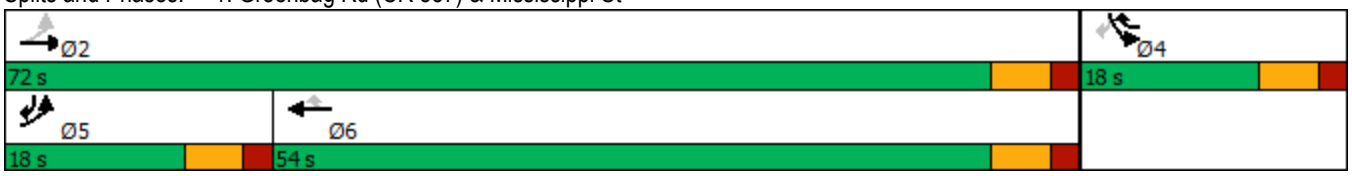
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1753	1846	1783	1546	1727	1530
Flt Permitted	0.220				0.950	
Satd. Flow (perm)	406	1846	1783	1546	1727	1530
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				191		99
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	720	539	191	59	99
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

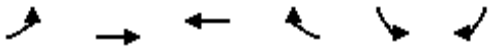


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	16.0	16.0	16.0
Total Split (s)	18.0	72.0	54.0	18.0	18.0	18.0
Total Split (%)	20.0%	80.0%	60.0%	20.0%	20.0%	20.0%
Maximum Green (s)	12.0	66.0	48.0	12.0	12.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	39.4	39.4	23.0	36.9	7.6	24.1
Actuated g/C Ratio	0.66	0.66	0.39	0.62	0.13	0.41
v/c Ratio	0.41	0.59	0.78	0.19	0.27	0.15
Control Delay	6.3	7.8	25.0	1.2	30.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.8	25.0	1.2	30.1	4.4
LOS	A	A	C	A	C	A
Approach Delay		7.4	18.8		14.0	
Approach LOS		A	B		B	
Queue Length 50th (ft)	21	110	160	0	19	0
Queue Length 95th (ft)	47	213	291	16	60	29
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	550	1791	1463	1140	361	732
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.40	0.37	0.17	0.16	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 59.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St





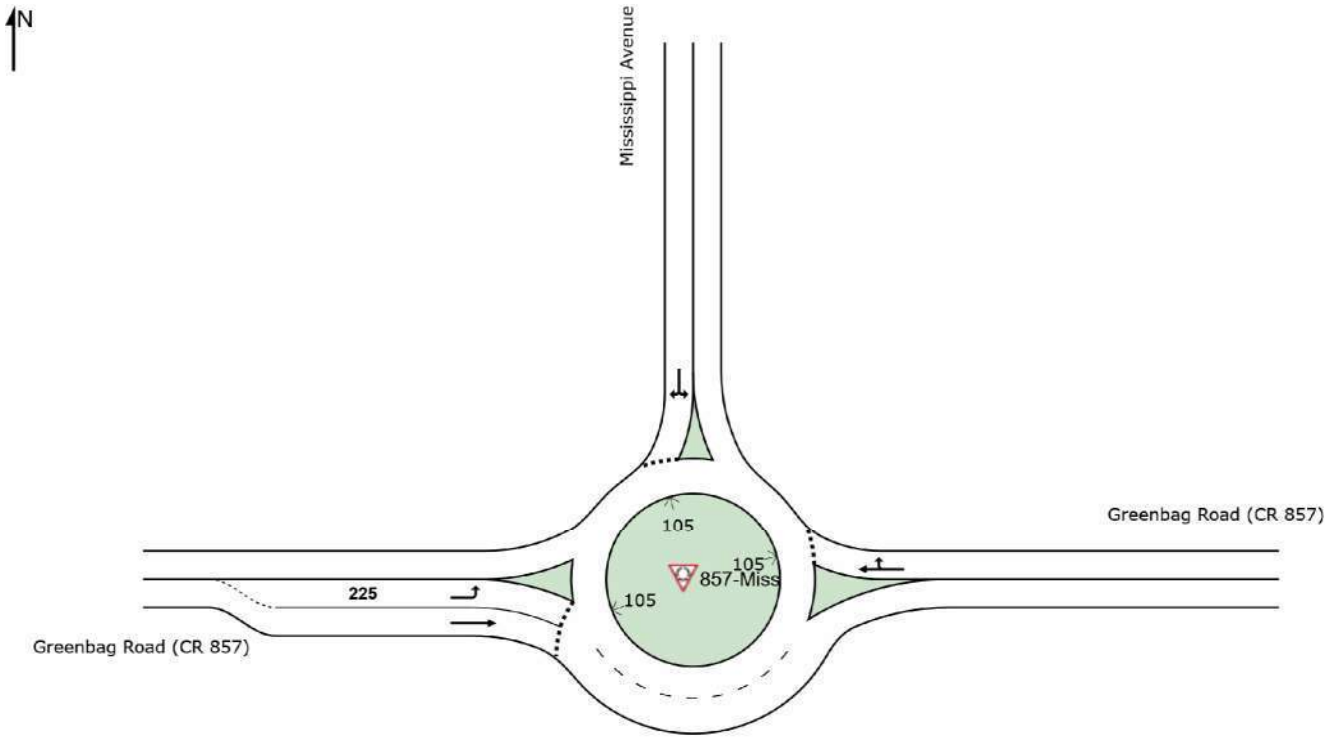
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	189	670	501	178	55	92
Future Volume (veh/h)	189	670	501	178	55	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	2003	2003	1847	1876	1876	1862
Adj Flow Rate, veh/h	203	720	539	191	59	99
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	2	0	0	1
Cap, veh/h	461	1250	720	795	198	335
Arrive On Green	0.10	0.62	0.39	0.39	0.11	0.11
Sat Flow, veh/h	1908	2003	1847	1590	1787	1578
Grp Volume(v), veh/h	203	720	539	191	59	99
Grp Sat Flow(s),veh/h/ln	1908	2003	1847	1590	1787	1578
Q Serve(g_s), s	2.5	9.5	11.4	3.1	1.4	2.4
Cycle Q Clear(g_c), s	2.5	9.5	11.4	3.1	1.4	2.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	461	1250	720	795	198	335
V/C Ratio(X)	0.44	0.58	0.75	0.24	0.30	0.30
Avail Cap(c_a), veh/h	773	2922	1959	1863	474	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	5.0	11.9	6.4	18.5	15.0
Incr Delay (d2), s/veh	0.7	0.4	1.6	0.2	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.7	3.6	1.0	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.8	5.4	13.5	6.6	19.3	15.5
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h		923	730		158	
Approach Delay, s/veh		6.2	11.7		16.9	
Approach LOS		A	B		B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.2		11.0	10.6	23.6
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		66.0		12.0	12.0	48.0
Max Q Clear Time (g_c+I1), s		11.5		4.4	4.5	13.4
Green Ext Time (p_c), s		5.6		0.3	0.3	4.3
Intersection Summary						
HCM 6th Ctrl Delay			9.3			
HCM 6th LOS			A			

SITE LAYOUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout



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Organisation: STAHL SHAEFFER ENGINEERING LLC | Created: Wednesday, April 03, 2019 11:05:08 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	645	4.0	0.829	21.0	LOS C	23.6	617.8	0.87	1.01	1.54	28.5
16	R2	256	10.0	0.829	21.2	LOS C	23.6	617.8	0.87	1.01	1.54	27.7
Approach		901	5.7	0.829	21.1	LOS C	23.6	617.8	0.87	1.01	1.54	28.2
North: Mississippi Avenue												
7	L2	167	18.0	0.544	15.7	LOS B	3.4	94.5	0.74	0.98	1.22	22.0
14	R2	163	11.0	0.544	15.3	LOS B	3.4	94.5	0.74	0.98	1.22	21.1
Approach		330	14.5	0.544	15.5	LOS B	3.4	94.5	0.74	0.98	1.22	21.6
West: Greenbag Road (CR 857)												
5	L2	171	5.0	0.151	4.5	LOS A	0.6	16.1	0.33	0.21	0.33	33.0
2	T1	377	2.0	0.324	6.2	LOS A	1.6	41.4	0.40	0.27	0.40	34.6
Approach		548	2.9	0.324	5.7	LOS A	1.6	41.4	0.37	0.25	0.37	34.1
All Vehicles		1779	6.5	0.829	15.3	LOS B	23.6	617.8	0.69	0.77	1.12	28.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE LEVEL OF SERVICE

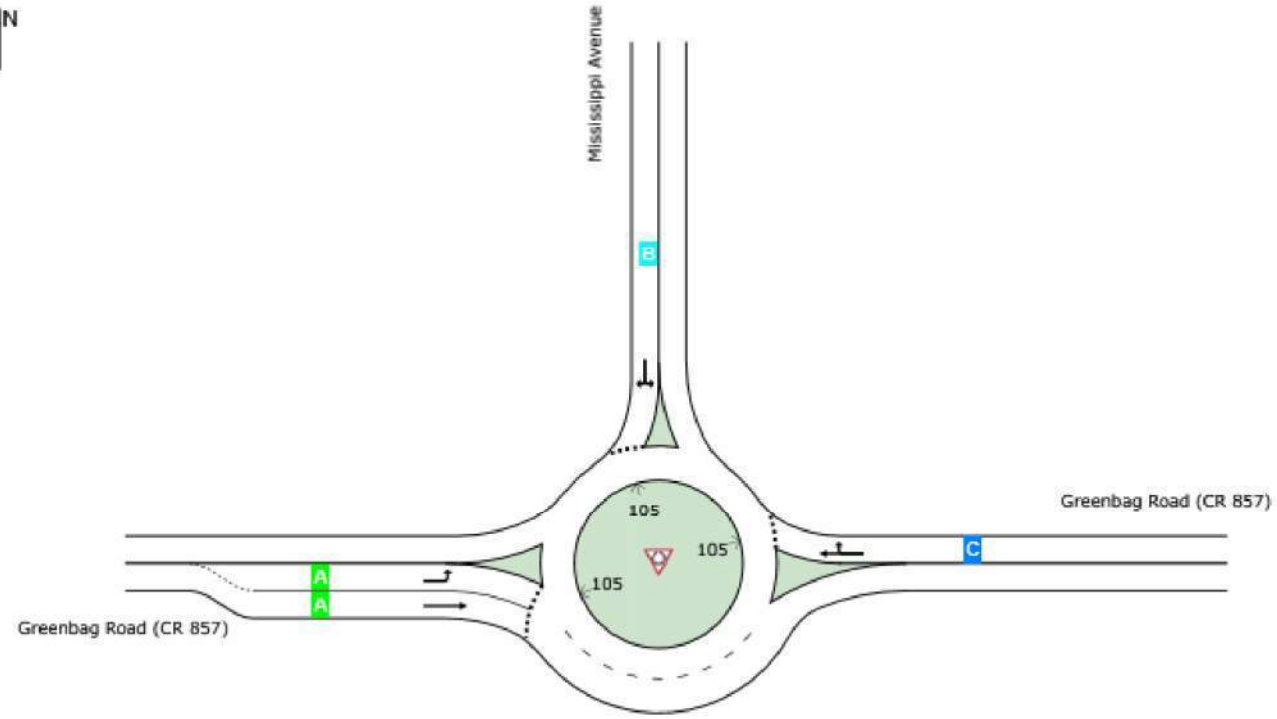
Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	C	B	A	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

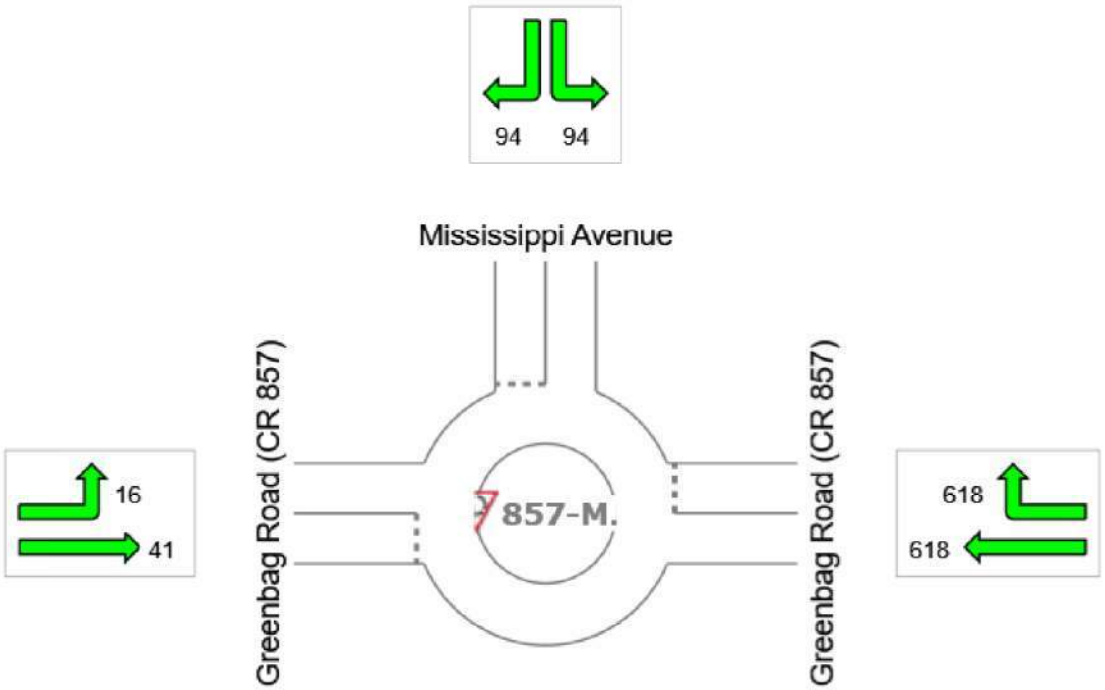
Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	618	94	41	618



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

```
  N   L2   1 Subdominant    167  1.18   198    0.0    0.0    N       -      16.0    0.00    0.000
  E   T1   2 Dominant       167  1.18   198    0.0    0.0    N       -      16.0    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

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Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
            No.  Type      In-Bunch  Prop.  Priority  HVE for  -------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                               sec       ft     sec
-------------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    T1    1 Dominant       0.00    0.000      N       1.04     4.98   120.2     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.10     4.98   120.2     2.61
-------------------------------------------------------------------------------------------------
North: Mississippi Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.18     4.98   187.6     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.11     4.98   187.6     2.61
-------------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.05     4.54   106.9     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.02     4.54   106.9     2.54
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

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Roundabout Flow Rates
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane          Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
----------------------------------------
  East: Greenbag Road (CR 857)
  1             171     179    100.0%
  Total         171     179
----------------------------------------
  North: Mississippi Avenue
  1             645     671    100.0%
  Total         645     671
----------------------------------------
  West: Greenbag Road (CR 857)
  1             167     198    100.0%
  Total         167     198
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

--------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
--------------------------------------
  East: Greenbag Road (CR 857)
  1           256      645      901
  Total       256      645      901
--------------------------------------
  North: Mississippi Avenue
  1           163      167      330
  Total       163      167      330
--------------------------------------
  West: Greenbag Road (CR 857)
  1             0      171      171
  2           377        0      377
  Total       377      171      548
--------------------------------------
```

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Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	32.6	28.5	3336.9#	79.9#	407.9	407.9	14.3
	North	R2	31.6	27.7	3336.9#	82.1#	161.7	161.7	5.8
North: Mississippi Avenue									
	East	L2	24.3	22.0	3351.9#	103.8#	106.3	106.3	4.8
	West	R2	23.2	21.1	3351.9#	108.3#	103.3	103.3	4.9
West: Greenbag Road (CR 857)									
	North	L2	34.4	33.0	3464.3#	71.5#	112.1	112.1	3.4
	East	T1	36.6	34.6	3365.6#	66.4#	240.1	240.1	6.9
ALL VEHICLES:			31.8	28.1	3358.0#	81.4#	1131.5	1131.5	40.2

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	218.2	25.7	162.1	1600	488	NA
	North	R2	153.6	22.5	69.1	1600	488	NA
North: Mississippi Avenue								
	East	L2	62.8	16.0	246.6	1600	488	NA
	West	R2	131.9	21.2	62.2	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	67.3	16.5	264.3	1600	488	NA
	East	T1	175.9	23.7	165.6	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	App. Speeds Negn mph	Exit Speeds Negn Cruise mph	Exit Speeds mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	25.7	25.7	40.0	31.3	0.0
16	R2	40.0	22.5	22.5	40.0	31.3	0.0
North: Mississippi Avenue							
7	L2	25.0	16.0	16.0	25.0	18.1	0.0
14	R2	25.0	21.2	21.2	25.0	18.1	0.0
West: Greenbag Road (CR 857)							
5	L2	40.0	16.5	16.5	40.0	26.5	0.0
2	T1	40.0	23.7	23.7	40.0	29.9	0.0

HCM Delay Formula option used: Geometric Delay is not included in Control Delay.

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Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn	Mov Cl.	Arv Flow veh/h	Opng Flow veh/h	Movement Adjust. Flow pcu/h	Total Cap. veh/h	Prac. Deg. Satn xp	Prac. Spare Cap. %	Deg. Satn x
East: Greenbag Road (CR 857)									
6	T1	#	645	171	179	779	0.85	3	0.829*
16	R2	#	256	171	179	309	0.85	3	0.829*
North: Mississippi Avenue									
7	L2	#	167	645	671	308	0.85	56	0.544
14	R2	#	163	645	671	299	0.85	56	0.544
West: Greenbag Road (CR 857)									
5	L2	#	171	167	198	1130	0.85	462	0.151
2	T1	#	377	167	198	1163	0.85	162	0.324

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	3.77	4.52	21.0	1.01	650.1	36.60	407.9	14.3	28.5
16	R2	1.51	1.81	21.2	1.01	257.7	26.00	161.7	5.8	27.7
North: Mississippi Avenue										
7	L2	0.73	0.87	15.7	0.98	164.7	8.62	106.3	4.8	22.0
14	R2	0.69	0.83	15.3	0.98	160.1	8.44	103.3	4.9	21.1
West: Greenbag Road (CR 857)										
5	L2	0.21	0.26	4.5	0.21	35.5	3.71	112.1	3.4	33.0
2	T1	0.65	0.78	6.2	0.27	101.1	8.53	240.1	6.9	34.6

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Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	245.18	28.2	254.3	0.28	0.023	0.673
16	R2	95.95	8.6	77.6	0.09	0.007	0.199
		341.13	36.8	331.8	0.36	0.030	0.872
North: Mississippi Avenue							
7	L2	72.14	6.3	57.8	0.05	0.005	0.222
14	R2	71.12	8.2	75.3	0.06	0.006	0.315
		143.26	14.5	133.1	0.11	0.011	0.537
West: Greenbag Road (CR 857)							
5	L2	51.68	3.5	31.5	0.04	0.003	0.050
2	T1	88.65	5.9	52.9	0.07	0.005	0.044
		140.33	9.4	84.4	0.11	0.008	0.095
INTERSECTION:		624.72	60.8	549.3	0.58	0.049	1.503

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.37	14.5	387.4	0.42	0.034	1.025
16	R2	0.37	18.8	298.1	0.33	0.027	0.764
		0.37	15.5	362.0	0.40	0.032	0.951
North: Mississippi Avenue							
7	L2	0.42	16.8	337.7	0.29	0.031	1.299
14	R2	0.43	12.6	452.8	0.34	0.034	1.893
		0.42	14.4	394.5	0.31	0.033	1.592
West: Greenbag Road (CR 857)							

	5	L2	0.29	32.0	174.6	0.22	0.017	0.280
	2	T1	0.23	40.6	136.8	0.19	0.013	0.114
			0.25	37.4	148.8	0.20	0.014	0.167
INTERSECTION:			0.34	18.6	301.6	0.32	0.027	0.826

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Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
East: Greenbag Road (CR 857)								
1	901	1087	0.829	21.1	1.01	23.6	617.8	1600.0
North: Mississippi Avenue								
1	330	608	0.544	15.5	0.98	3.4	94.5	1600.0
West: Greenbag Road (CR 857)								
1	171	1130	0.151	4.5	0.21	0.6	16.1	225.0T
2	377	1163	0.324	6.2	0.27	1.6	41.4	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
East: Greenbag Road (CR 857)					
1	901	150	1087	0.829	100
North: Mississippi Avenue					
1	330	150	608	0.544	100
West: Greenbag Road (CR 857)					
1	171	150	1130	0.151	100
2	377	150	1163	0.324	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
East: Greenbag Road (CR 857)							
1	901	6		0.829	21.1	618	1600
	901	6		0.829	21.1	618	
North: Mississippi Avenue							
1	330	15		0.544	15.5	94	1600
	330	15		0.544	15.5	94	
West: Greenbag Road (CR 857)							
1	171	5		0.151	4.5	16	225
2	377	2		0.324	6.2	41	1600
	548	3		0.324	5.7	41	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
1779	6	0.829	15.3	618

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------
                                      Average  Driver
 Lane   Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing  Space    Time
         mph    veh/h   sec      ft      ft      sec
-----------------------------------------------------
 East: Greenbag Road (CR 857)
 1       24.8   1380    2.61    94.89   26.14    1.89
-----------------------------------------------------
 North: Mississippi Avenue
 1       18.6   1380    2.61    71.20   27.91    1.59
-----------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7   1420    2.54    88.12   25.40    1.80
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                          ------------------  Delay (seconds/veh)  -------------------
        Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane   Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.      x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.829    NA      NA     3.3   7.5  13.6  21.1   6.3  15.6   5.5  10.1   0.0   21.1
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.544    NA      NA     5.9   8.6   6.8  15.5   4.3  12.3   2.7   9.7   0.0   15.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.151    NA      NA     3.2   3.9   0.6   4.5   5.0   2.9   0.0   2.9   0.0    4.5
 2      0.324    NA      NA     3.1   4.7   1.5   6.2   6.5   3.6   0.0   3.6   0.0    6.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1    0.829    NA      NA     3.0    3.7   5.8    9.5   23.6  0.16   0.39    0.0    NA
-------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1    0.544    NA      NA     0.4    0.9   0.4    1.4    3.4  0.02   0.06    0.0    NA
-------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1    0.151    NA      NA     0.0    0.2   0.0    0.2    0.6  0.03   0.07    NA     0.0
 2    0.324    NA      NA     0.0    0.7   0.0    0.7    1.6  0.01   0.03    0.0    NA
-------------------------------------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
```

HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.829	NA	NA	79.2	97.1	151.4	248.6	617.8	0.16	0.39	0.0	NA
North: Mississippi Avenue												
1	0.544	NA	NA	11.6	26.5	11.5	38.0	94.5	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	6.5	0.0	6.5	16.1	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	16.7	0.0	16.7	41.4	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.829	NA	NA	3.0	5.3	9.6
North: Mississippi Avenue						
1	0.544	NA	NA	0.4	1.4	2.6
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	0.2	0.4
2	0.324	NA	NA	0.0	0.6	1.2

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.829	NA	NA	79.2	138.0	250.3
North: Mississippi Avenue						
1	0.544	NA	NA	11.6	39.6	71.9
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	5.6	10.1
2	0.324	NA	NA	0.0	16.5	29.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.829	9.5	12.3	17.4	20.1	23.6	26.2	28.2
North: Mississippi Avenue								
1	0.544	1.4	1.8	2.5	2.9	3.4	3.8	4.0
West: Greenbag Road (CR 857)								
1	0.151	0.2	0.3	0.5	0.5	0.6	0.7	0.7
2	0.324	0.7	0.8	1.2	1.4	1.6	1.8	1.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.829	248.4	321.8	453.7	525.3	617.8	685.7	737.1
North: Mississippi Avenue								
1	0.544	38.0	49.2	69.4	80.3	94.5	104.9	112.7
West: Greenbag Road (CR 857)								
1	0.151	6.5	8.4	11.8	13.7	16.1	17.8	19.2
2	0.324	16.7	21.6	30.4	35.2	41.4	46.0	49.4

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.829	NA	NA	0.63	0.37	0.00	1.01	907.7	0.67	601.2	0.87	1.54
North: Mississippi Avenue												
1	0.544	NA	NA	0.74	0.24	0.00	0.98	324.8	0.48	157.1	0.74	1.22
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.21	0.00	0.00	0.21	35.5	0.00	0.0	0.33	0.33
2	0.324	NA	NA	0.27	0.00	0.00	0.27	101.1	0.00	0.0	0.40	0.40

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

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Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	645.3	255.8	901.2
%HV (all designations)	4.0	10.0	5.7
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	167.4	162.8	330.2
%HV (all designations)	18.0	11.0	14.5
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	170.9	376.7	547.7
%HV (all designations)	5.0	2.0	2.9

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT

Flow Rate	619.5	230.2	849.8
Mov Class %	96.0	90.0	94.3
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	137.3	144.9	282.2
Mov Class %	82.0	89.0	85.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	162.4	369.2	531.6
Mov Class %	95.0	98.0	97.1
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	25.8	25.6	51.4
Mov Class %	4.0	10.0	5.7
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	30.1	17.9	48.0
Mov Class %	18.0	11.0	14.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	8.5	7.5	16.1
Mov Class %	5.0	2.0	2.9
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	619.5	230.2	849.8
HV	25.8	25.6	51.4
Total	645.3	255.8	901.2
Approach	645.3	255.8	901.2

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	137.3	144.9	282.2
HV	30.1	17.9	48.0
Total	167.4	162.8	330.2
Approach	167.4	162.8	330.2

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	162.4	*	162.4
HV	8.5	*	8.5

```
   Total           170.9       *   170.9
 Lane  2
   LV                *   369.2   369.2
   HV                *     7.5     7.5
   Total             *   376.7   376.7
-----------------------------------------
 Approach          170.9   376.7   547.7
-----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
-----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
-----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:06:28 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	539	2.0	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.8
16	R2	191	0.0	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.0
Approach		730	1.5	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.6
North: Mississippi Avenue												
7	L2	59	0.0	0.202	6.7	LOS A	0.9	21.9	0.59	0.55	0.59	24.2
14	R2	99	1.0	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.0
Approach		158	0.6	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.4
West: Greenbag Road (CR 857)												
5	L2	203	1.0	0.153	4.0	LOS A	0.7	17.0	0.17	0.07	0.17	33.4
2	T1	720	1.0	0.541	8.5	LOS A	4.2	104.9	0.30	0.13	0.30	33.4
Approach		924	1.0	0.541	7.5	LOS A	4.2	104.9	0.27	0.12	0.27	33.4
All Vehicles		1812	1.2	0.662	9.6	LOS A	8.2	207.6	0.47	0.35	0.54	31.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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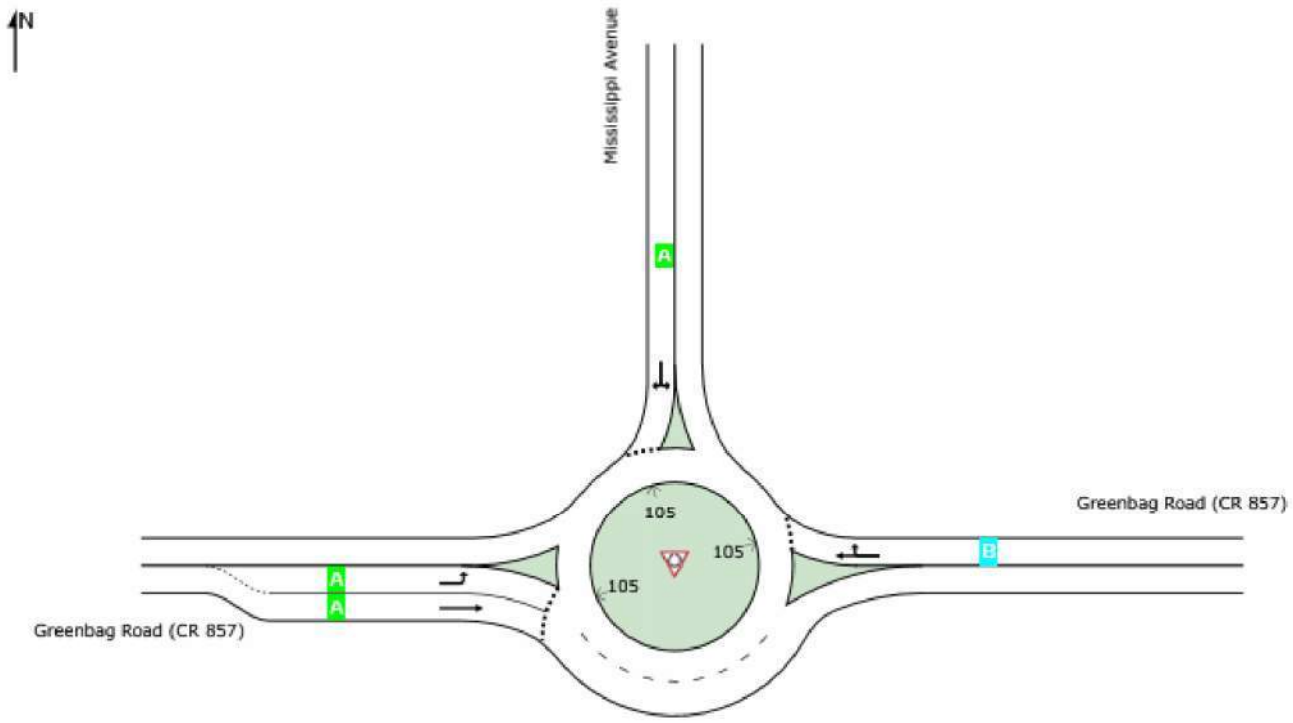
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	B	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

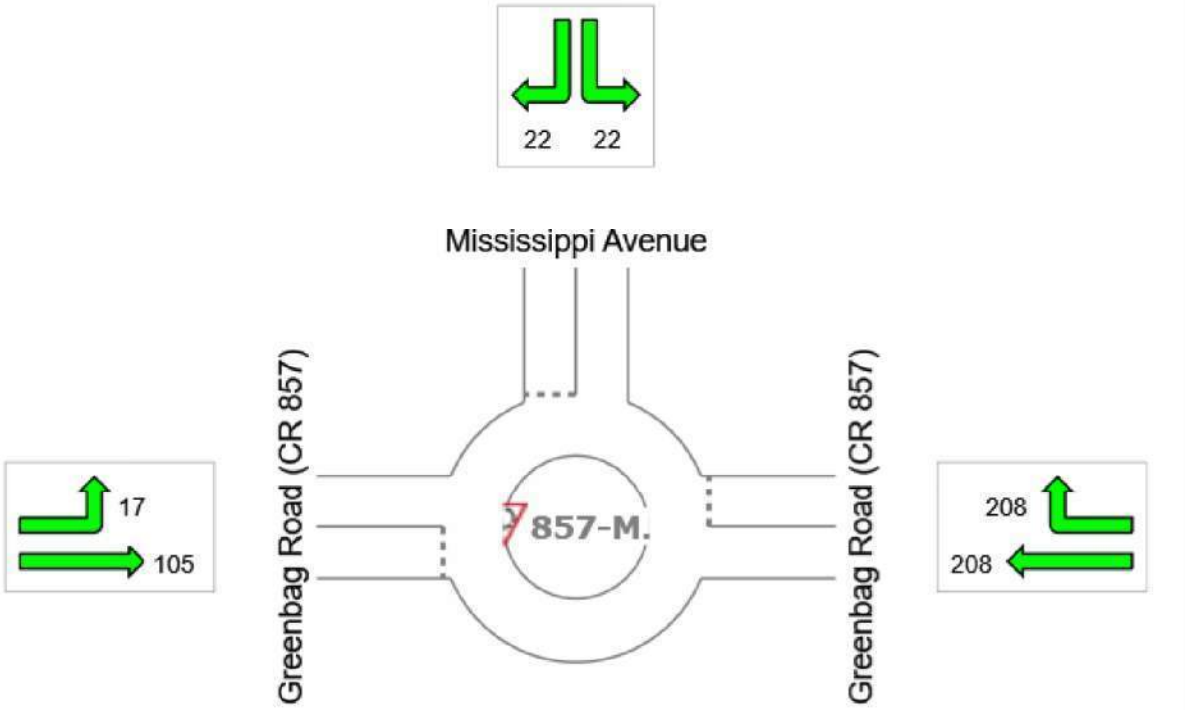
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	208	22	105	208



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

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- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													
N	L2	1	Subdominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000

```
  E   T1   2 Dominant        59  1.00    59    0.0    0.0    N       -      16.0    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                              Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for  -------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                          sec       ft     sec
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    T1    1 Dominant       0.00    0.000      N       1.02     4.98   120.2     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.00     4.98   120.2     2.61
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.00     4.98   187.6     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.01     4.98   187.6     2.61
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.01     4.54   106.9     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.01     4.54   106.9     2.54
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane         Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
----------------------------------------
  East: Greenbag Road (CR 857)
  1             203     205    100.0%
  Total         203     205
----------------------------------------
  North: Mississippi Avenue
  1             539     549    100.0%
  Total         539     549
----------------------------------------
  West: Greenbag Road (CR 857)
  1              59      59    100.0%
  Total          59      59
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

----------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
----------------------------------------
  East: Greenbag Road (CR 857)
  1           191      539      730
  Total       191      539      730
----------------------------------------
  North: Mississippi Avenue
  1            99       59      158
  Total        99       59      158
----------------------------------------
  West: Greenbag Road (CR 857)
  1             0      203      203
  2           720        0      720
  Total       720      203      923
----------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	35.3	31.8	3337.4#	71.5#	340.5	340.5	10.7
	North	R2	34.2	31.0	3337.4#	73.4#	121.0	121.0	3.9
North: Mississippi Avenue									
	East	L2	25.3	24.2	3331.6#	94.0#	37.3	37.3	1.5
	West	R2	24.1	23.0	3331.6#	98.6#	62.4	62.4	2.7
West: Greenbag Road (CR 857)									
	North	L2	34.9	33.4	3464.3#	70.8#	133.3	133.3	4.0
	East	T1	36.9	33.4	3365.6#	68.7#	459.2	459.2	13.8
ALL VEHICLES:			34.8	31.5	3362.3#	72.7#	1153.8	1153.8	36.6

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	218.2	25.7	162.1	1600	488	NA
	North	R2	153.6	22.5	69.1	1600	488	NA
North: Mississippi Avenue								
	East	L2	62.8	16.0	246.6	1600	488	NA
	West	R2	131.9	21.2	62.2	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	67.3	16.5	264.3	1600	488	NA
	East	T1	175.9	23.7	165.6	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	App. Speeds Negn mph	Exit Speeds Negn Cruise mph	Exit Speeds mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	25.7	25.7	40.0	29.0	0.0
16	R2	40.0	22.5	22.5	40.0	29.0	0.0
North: Mississippi Avenue							
7	L2	25.0	16.0	16.0	25.0	18.6	0.0
14	R2	25.0	21.2	21.2	25.0	18.6	0.0
West: Greenbag Road (CR 857)							
5	L2	40.0	16.5	16.5	40.0	26.5	0.0
2	T1	40.0	23.7	23.7	40.0	38.1	0.0

HCM Delay Formula option used: Geometric Delay is not included in Control Delay.

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn	Mov Cl.	Arv Flow veh/h	Opng Flow veh/h	Movement Adjust. Flow pcu/h	Total Cap. veh/h	Prac. Deg. Satn xp	Prac. Spare Cap. %	Deg. Satn x
East: Greenbag Road (CR 857)									
6	T1	#	539	203	205	814	0.85	28	0.662*
16	R2	#	191	203	205	289	0.85	28	0.662*
North: Mississippi Avenue									
7	L2	#	59	539	549	293	0.85	321	0.202
14	R2	#	99	539	549	490	0.85	321	0.202
West: Greenbag Road (CR 857)									
5	L2	#	203	59	59	1332	0.85	457	0.153
2	T1	#	720	59	59	1332	0.85	57	0.541

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	1.91	2.29	12.7	0.61	327.1	18.84	340.5	10.7	31.8
16	R2	0.67	0.81	12.7	0.61	116.2	7.65	121.0	3.9	31.0
North: Mississippi Avenue										
7	L2	0.11	0.13	6.7	0.55	32.8	2.14	37.3	1.5	24.2
14	R2	0.19	0.22	6.8	0.55	54.8	3.69	62.4	2.7	23.0
West: Greenbag Road (CR 857)										
5	L2	0.22	0.27	4.0	0.07	13.8	4.18	133.3	4.0	33.4
2	T1	1.71	2.05	8.5	0.13	96.7	17.08	459.2	13.8	33.4

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	167.48	19.4	173.3	0.21	0.016	0.242
16	R2	58.59	5.0	44.4	0.06	0.004	0.053
		226.08	24.3	217.7	0.27	0.020	0.294
North: Mississippi Avenue							
7	L2	18.98	1.3	11.5	0.01	0.001	0.006
14	R2	32.18	3.0	27.2	0.02	0.002	0.021
		51.16	4.3	38.7	0.03	0.003	0.026
West: Greenbag Road (CR 857)							
5	L2	55.88	3.5	31.1	0.04	0.003	0.018
2	T1	173.25	10.9	97.2	0.14	0.009	0.053
		229.13	14.4	128.2	0.18	0.012	0.071
INTERSECTION:		506.37	43.1	384.6	0.47	0.036	0.392

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.31	17.6	316.3	0.38	0.030	0.441
16	R2	0.30	24.3	228.0	0.29	0.021	0.270
		0.30	19.0	293.1	0.36	0.028	0.396
North: Mississippi Avenue							
7	L2	0.32	28.8	192.1	0.12	0.016	0.098
14	R2	0.32	20.5	270.3	0.19	0.022	0.205
		0.32	23.0	241.0	0.16	0.020	0.165
West: Greenbag Road (CR 857)							

```
    5  L2           0.26   38.3   144.7    0.19   0.014   0.084
    2  T1           0.23   42.1   131.5    0.18   0.012   0.072
                 ----------------------------------------------
                    0.24   41.2   134.5    0.19   0.013   0.075
--------------------------------------------------------------------
 INTERSECTION:      0.27   26.8   207.1    0.25   0.019   0.211
--------------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.  95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         730  1103  0.662   12.7  0.61    8.2  207.6  1600.0
-------------------------------------------------------------
 North: Mississippi Avenue
 1         158   783  0.202    6.8  0.55    0.9   21.9  1600.0
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         203  1332  0.153    4.0  0.07    0.7   17.0   225.0T
 2         720  1332  0.541    8.5  0.13    4.2  104.9  1600.0
-------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        730     150  1103   0.662  100
----------------------------------------
 North: Mississippi Avenue
 1        158     150   783   0.202  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        203     150  1332   0.153  100
 2        720     150  1332   0.541  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV  Basic   Sat   Delay   Queue    Length
        (veh/h)       Satf.    x     sec       ft      ft
------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        730      1          0.662   12.7    208     1600
       -----------------------------------------------------
          730      1          0.662   12.7    208
------------------------------------------------------------
 North: Mississippi Avenue
 1        158      1          0.202    6.8     22     1600
       -----------------------------------------------------
          158      1          0.202    6.8     22
------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        203      1          0.153    4.0     17      225
 2        720      1          0.541    8.5    105     1600
       -----------------------------------------------------
          924      1          0.541    7.5    105
============================================================
 ALL VEHICLES
        Total     %           Max   Aver.    Max
        Flow     HV           X    Delay   Queue
        1812      1          0.662    9.6    208
============================================================
Peak flow period = 15 minutes.
```

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                        Average  Driver
 Lane   Satn    Satn    Satn    Satn     Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1       24.9   1380    2.61    95.15    25.30    1.92
-----------------------------------------------------------
 North: Mississippi Avenue
 1       19.3   1380    2.61    73.84    25.13    1.72
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7   1420    2.54    88.12    25.20    1.81
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                          ------------------  Delay (seconds/veh)  -------------------
        Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane   Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.      x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.662    NA      NA     3.3   6.6   6.1  12.7   6.3   8.4   1.4   7.0   0.0   12.7
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.202    NA      NA     4.6   5.6   1.2   6.8   4.3   4.3   0.0   4.3   0.0    6.8
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.153    NA      NA     2.7   3.5   0.5   4.0   5.0   3.1   0.0   3.1   0.0    4.0
 2      0.541    NA      NA     2.7   5.4   3.1   8.5   6.5   6.6   0.0   6.6   0.0    8.5
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1    0.662    NA      NA     0.6    2.3   1.0    3.3    8.2  0.05   0.13    0.0    NA
-------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1    0.202    NA      NA     0.0    0.4   0.0    0.4    0.9  0.01   0.01    0.0    NA
-------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1    0.153    NA      NA     0.0    0.3   0.0    0.3    0.7  0.03   0.08    NA     0.0
 2    0.541    NA      NA     0.0    1.7   0.0    1.7    4.2  0.03   0.07    0.0    NA
-------------------------------------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
```

HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.662	NA	NA	14.1	57.4	26.2	83.5	207.6	0.05	0.13	0.0	NA
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	8.8	0.0	8.8	21.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	6.8	0.0	6.8	17.0	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	42.2	0.0	42.2	104.9	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.662	NA	NA	0.6	2.6	4.7
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	0.3	0.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	0.2	0.4
2	0.541	NA	NA	0.0	1.7	3.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.662	NA	NA	14.1	65.2	118.3
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	7.5	13.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	5.6	10.2
2	0.541	NA	NA	0.0	43.1	78.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.662	3.3	4.3	6.0	7.0	8.2	9.1	9.8
North: Mississippi Avenue								
1	0.202	0.4	0.5	0.6	0.7	0.9	1.0	1.0
West: Greenbag Road (CR 857)								
1	0.153	0.3	0.4	0.5	0.6	0.7	0.7	0.8
2	0.541	1.7	2.2	3.1	3.5	4.2	4.6	5.0

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.662	83.5	108.1	152.5	176.5	207.6	230.4	247.7
North: Mississippi Avenue								
1	0.202	8.8	11.4	16.1	18.7	21.9	24.3	26.2
West: Greenbag Road (CR 857)								
1	0.153	6.8	8.9	12.5	14.5	17.0	18.9	20.3
2	0.541	42.2	54.6	77.0	89.2	104.9	116.4	125.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.662	NA	NA	0.52	0.09	0.00	0.61	443.3	0.17	126.7	0.69	0.86
North: Mississippi Avenue												
1	0.202	NA	NA	0.55	0.00	0.00	0.55	87.6	0.00	0.0	0.59	0.59
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.07	0.00	0.00	0.07	13.8	0.00	0.0	0.17	0.17
2	0.541	NA	NA	0.13	0.00	0.00	0.13	96.7	0.00	0.0	0.30	0.30

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	538.7	191.4	730.1
%HV (all designations)	2.0	0.0	1.5
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	59.1	98.9	158.1
%HV (all designations)	0.0	1.0	0.6
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	203.2	720.4	923.7
%HV (all designations)	1.0	1.0	1.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT

Flow Rate	527.9	191.4	719.3
Mov Class %	98.0	100.0	98.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	59.1	97.9	157.1
Mov Class %	100.0	99.0	99.4
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	201.2	713.2	914.4
Mov Class %	99.0	99.0	99.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	10.8	0.0	10.8
Mov Class %	2.0	0.0	1.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	0.0	1.0	1.0
Mov Class %	0.0	1.0	0.6
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	2.0	7.2	9.2
Mov Class %	1.0	1.0	1.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	527.9	191.4	719.3
HV	10.8	*	10.8
Total	538.7	191.4	730.1
Approach	538.7	191.4	730.1

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	59.1	97.9	157.1
HV	*	1.0	1.0
Total	59.1	98.9	158.1
Approach	59.1	98.9	158.1

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	201.2	*	201.2
HV	2.0	*	2.0

```
   Total           203.2       *   203.2
 Lane  2
   LV                *   713.2   713.2
   HV                *     7.2     7.2
   Total             *   720.4   720.4
-----------------------------------------
 Approach          203.2   720.4   923.7
-----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

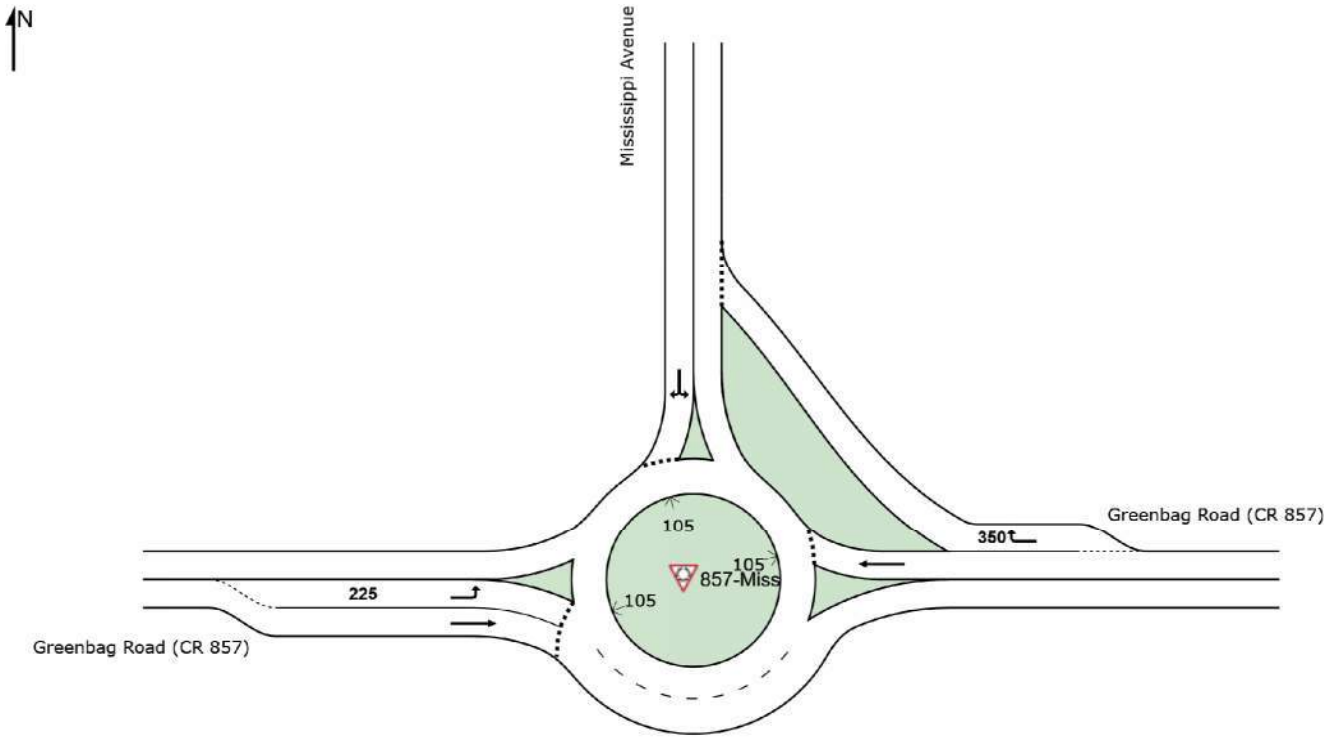
Go to Table Links (Top)

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Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

SITE LAYOUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	645	4.0	0.557	9.7	LOS A	3.7	95.7	0.51	0.35	0.51	33.2
16	R2	256	10.0	0.233	5.4	LOS A	1.0	26.4	0.34	0.21	0.34	34.2
Approach		901	5.7	0.557	8.5	LOS A	3.7	95.7	0.46	0.31	0.46	33.5
North: Mississippi Avenue												
7	L2	167	18.0	0.544	15.7	LOS B	3.4	94.5	0.74	0.98	1.22	22.0
14	R2	163	11.0	0.544	15.3	LOS B	3.4	94.5	0.74	0.98	1.22	21.1
Approach		330	14.5	0.544	15.5	LOS B	3.4	94.5	0.74	0.98	1.22	21.6
West: Greenbag Road (CR 857)												
5	L2	171	5.0	0.151	4.5	LOS A	0.6	16.1	0.33	0.21	0.33	33.0
2	T1	377	2.0	0.324	6.2	LOS A	1.6	41.4	0.40	0.27	0.40	34.6
Approach		548	2.9	0.324	5.7	LOS A	1.6	41.4	0.37	0.25	0.37	34.1
All Vehicles		1779	6.5	0.557	8.9	LOS A	3.7	95.7	0.48	0.42	0.57	30.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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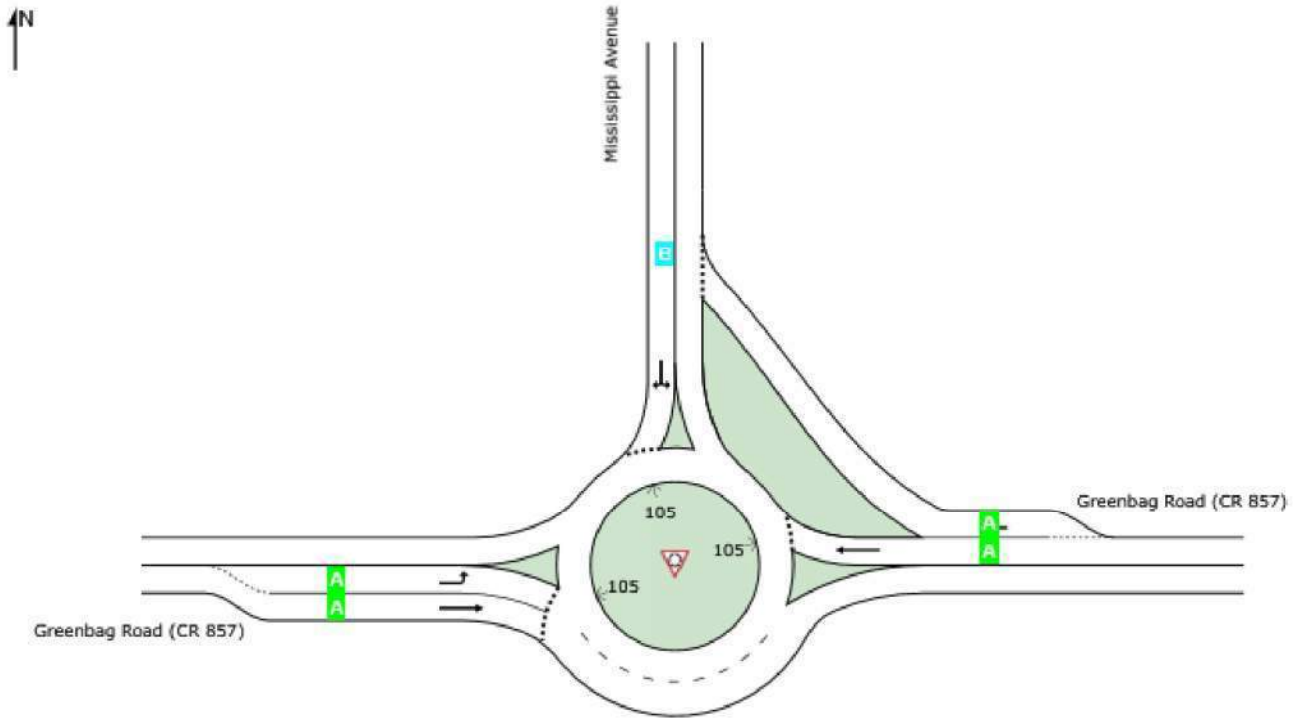
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	B	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

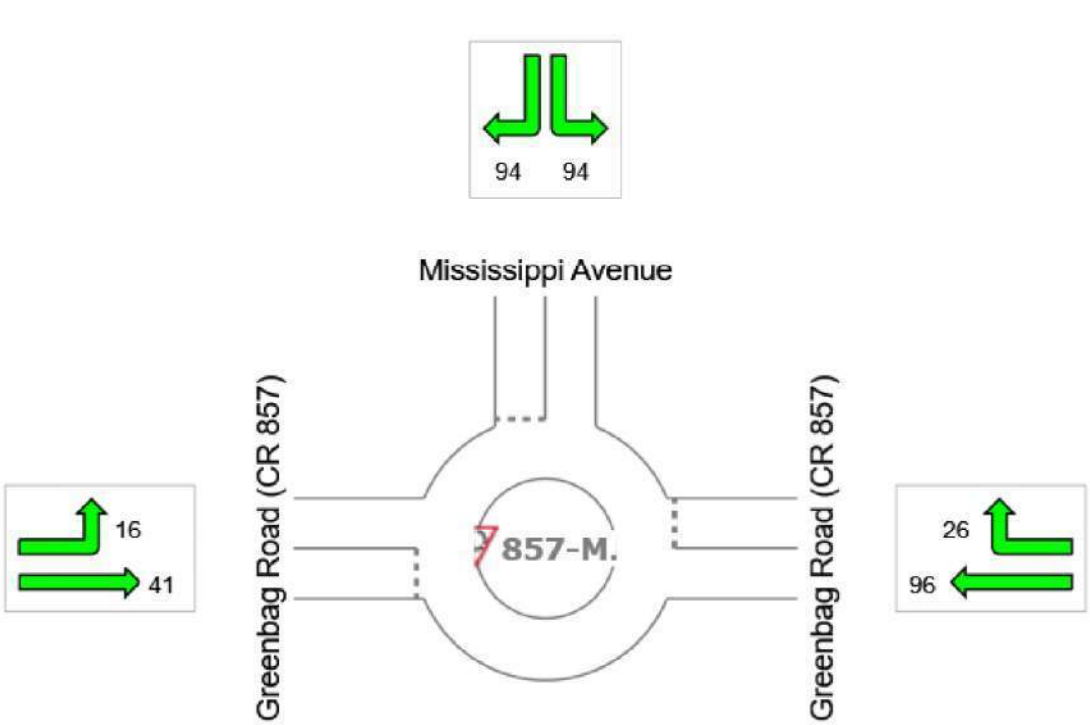
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	96	94	41	96



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

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Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	2	Excl. Slip	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

N	L2	1	Subdominant	167	1.18	198	0.0	0.0	N	-	16.0	0.00	0.000
E	T1	2	Dominant	167	1.18	198	0.0	0.0	N	-	16.0	0.00	0.000

Roundabout Capacity Model: US HCM 6

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
East: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	T1	1	Dominant	0.00	0.000	N	1.04	4.54	109.7	2.54
N	R2	2	Excl. Slip	0.00	0.000	N	1.10	4.54	109.7	2.54
North: Mississippi Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.18	4.98	187.6	2.61
W	R2	1	Dominant	0.00	0.000	N	1.11	4.98	187.6	2.61
West: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.05	4.54	106.9	2.54
E	T1	2	Dominant	0.00	0.000	N	1.02	4.54	106.9	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	171	179	100.0%
Total	171	179	
North: Mississippi Avenue			
1	645	671	100.0%
Total	645	671	
West: Greenbag Road (CR 857)			
1	167	198	100.0%
Total	167	198	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

EXITING LANE FLOW RATES

Lane No.	Exiting Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	171	179	100.0%
Total	171	179	

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
East: Greenbag Road (CR 857)			
1	0	645	645
2	256	0	256
Total	256	645	901

```
  North: Mississippi Avenue
  1           163      167      330
  Total       163      167      330
---------------------------------------
  West: Greenbag Road (CR 857)
  1             0      171      171
  2           377        0      377
  Total       377      171      548
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed   Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s     veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1       36.5    33.2    3362.1#   69.0#     410.9       410.9      12.4
            North    R2       36.4    34.2    3269.1#   65.1#     158.4       158.4       4.6
-------------------------------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2       24.3    22.0    3351.9#  103.8#     106.3       106.3       4.8
             West    R2       23.2    21.1    3351.9#  108.3#     103.3       103.3       4.9
-------------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2       34.4    33.0    3464.3#   71.5#     112.1       112.1       3.4
             East    T1       36.6    34.6    3365.6#   66.4#     240.1       240.1       6.9
-------------------------------------------------------------------------------------------------
 ALL VEHICLES:                33.9    30.5    3357.4#   75.0#    1131.3      1131.3      37.1
-------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                           Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed  Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1     218.2   25.7  162.1   1600     488     NA
            North    R2     156.0   22.6   69.1   1600     488     NA
-------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2      62.8   16.0  246.6   1600     488     NA
             West    R2     131.9   21.2   62.2   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2      67.3   16.5  264.3   1600     488     NA
             East    T1     175.9   23.7  165.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            ------------   ------------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed     Delay
 ID   Turn   mph     mph    mph   mph      mph       sec
-----------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1    40.0   25.7   25.7  40.0     31.6      0.0
   16  R2    40.0   22.6   22.6  40.0     32.3      0.0
-----------------------------------------------------------
North: Mississippi Avenue
    7  L2    25.0   16.0   16.0  25.0     18.1      0.0
   14  R2    25.0   21.2   21.2  25.0     18.1      0.0
-----------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2    40.0   16.5   16.5  40.0     26.5      0.0
    2  T1    40.0   23.7   23.7  40.0     29.9      0.0
-----------------------------------------------------------
```

```
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


MOVEMENT CAPACITY PARAMETERS

-------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
-------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1  #     645    171    179    1160   0.85     53  0.557*
   16  R2  #     256    171    179    1096   0.85    264  0.233
-------------------------------------------------------------
North: Mississippi Avenue
    7  L2  #     167    645    671     308   0.85     56  0.544
   14  R2  #     163    645    671     299   0.85     56  0.544
-------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2  #     171    167    198    1130   0.85    462  0.151
    2  T1  #     377    167    198    1163   0.85    162  0.324
-------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1   1.74    2.09     9.7   0.35   225.5 16.25    410.9     12.4     33.2
   16  R2   0.39    0.46     5.4   0.21    54.5  5.44    158.4      4.6     34.2
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
    7  L2   0.73    0.87    15.7   0.98   164.7  8.62    106.3      4.8     22.0
   14  R2   0.69    0.83    15.3   0.98   160.1  8.44    103.3      4.9     21.1
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2   0.21    0.26     4.5   0.21    35.5  3.71    112.1      3.4     33.0
    2  T1   0.65    0.78     6.2   0.27   101.1  8.53    240.1      6.9     34.6
-------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Total   Total    Total    Total    Total    Total
                  $/h     gal/h    kg/h     kg/h     kg/h     kg/h
-----------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1         202.91   26.0    234.2     0.26    0.020    0.571
   16  R2          75.51    7.7     69.3     0.08    0.006    0.213
                 ---------------------------------------------------
                  278.42   33.7    303.4     0.34    0.026    0.785
-----------------------------------------------------------------
North: Mississippi Avenue
    7  L2          72.14    6.3     57.8     0.05    0.005    0.222
   14  R2          71.12    8.2     75.3     0.06    0.006    0.315
                 ---------------------------------------------------
                  143.26   14.5    133.1     0.11    0.011    0.537
-----------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2          51.68    3.5     31.5     0.04    0.003    0.050
    2  T1          88.65    5.9     52.9     0.07    0.005    0.044
                 ---------------------------------------------------
                  140.33    9.4     84.4     0.11    0.008    0.095
-----------------------------------------------------------------
 INTERSECTION:    562.00   57.6    520.9     0.56    0.045    1.416
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Rate    Eff.     Rate     Rate     Rate     Rate
                  $/mi    mpg      g/km     g/km     g/km     g/km
-----------------------------------------------------------------
```

```
East: Greenbag Road (CR 857)
    6  T1           0.31   15.8   354.1    0.40   0.031   0.864
   16  R2           0.30   20.7   271.7    0.31   0.023   0.837
                 ----------------------------------------------
                   0.30   16.9   331.2    0.37   0.028   0.856
--------------------------------------------------------------------
North: Mississippi Avenue
    7  L2           0.42   16.8   337.7    0.29   0.031   1.299
   14  R2           0.43   12.6   452.8    0.34   0.034   1.893
                 ----------------------------------------------
                   0.42   14.4   394.5    0.31   0.033   1.592
--------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2           0.29   32.0   174.6    0.22   0.017   0.280
    2  T1           0.23   40.6   136.8    0.19   0.013   0.114
                 ----------------------------------------------
                   0.25   37.4   148.8    0.20   0.014   0.167
--------------------------------------------------------------------
 INTERSECTION:     0.31   19.6   286.1    0.31   0.025   0.778
--------------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------------
                                                Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.   95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         645  1160  0.557    9.7  0.35    3.7   95.7  1600.0
 2         256  1096  0.233    5.4  0.21    1.0   26.4   350.0T
-------------------------------------------------------------------
 North: Mississippi Avenue
 1         330   608  0.544   15.5  0.98    3.4   94.5  1600.0
-------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         171  1130  0.151    4.5  0.21    0.6   16.1   225.0T
 2         377  1163  0.324    6.2  0.27    1.6   41.4  1600.0
-------------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        645     150  1160   0.557  100
 2        256     150  1096   0.233  100
----------------------------------------
 North: Mississippi Avenue
 1        330     150   608   0.544  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        171     150  1130   0.151  100
 2        377     150  1163   0.324  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue     Length
        (veh/h)       Satf.    x     sec       ft       ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        645      4          0.557    9.7     96     1600
 2        256     10          0.233    5.4     26      350
         ---------------------------------------------------
          901      6          0.557    8.5     96
-------------------------------------------------------------
 North: Mississippi Avenue
 1        330     15          0.544   15.5     94     1600
```

```
        ---------------------------------------------------
          330     15          0.544   15.5     94
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        171      5          0.151    4.5     16      225
 2        377      2          0.324    6.2     41     1600
        ---------------------------------------------------
          548      3          0.324    5.7     41
===========================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1779      6          0.557    8.9     96
===========================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                        Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy    Spacing   Space    Time
          mph     veh/h    sec       ft       ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        25.7    1420     2.54     95.59    25.80    1.85
 2      NA - Short Lane
-----------------------------------------------------------
 North: Mississippi Avenue
 1        18.6    1380     2.61     71.20    27.91    1.59
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2        23.7    1420     2.54     88.12    25.40    1.80
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                             ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green             dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.557    NA      NA      3.1   5.9   3.8   9.7   6.8   6.3   0.0   6.3   0.0    9.7
 2      0.233    NA      NA      3.3   4.5   1.0   5.4   4.8   3.8   0.0   3.8   0.0    5.4
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.544    NA      NA      5.9   8.6   6.8  15.5   4.3  12.3   2.7   9.7   0.0   15.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.151    NA      NA      3.2   3.9   0.6   4.5   5.0   2.9   0.0   2.9   0.0    4.5
 2      0.324    NA      NA      3.1   4.7   1.5   6.2   6.5   3.6   0.0   3.6   0.0    6.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.0	1.5	0.0	1.5	3.7	0.02	0.06	0.0	NA
2	0.233	NA	NA	0.0	0.4	0.0	0.4	1.0	0.03	0.08	NA	0.0
North: Mississippi Avenue												
1	0.544	NA	NA	0.4	0.9	0.4	1.4	3.4	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	0.2	0.0	0.2	0.6	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	0.7	0.0	0.7	1.6	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.0	38.5	0.0	38.5	95.7	0.02	0.06	0.0	NA
2	0.233	NA	NA	0.0	10.6	0.0	10.6	26.4	0.03	0.08	NA	0.0
North: Mississippi Avenue												
1	0.544	NA	NA	11.6	26.5	11.5	38.0	94.5	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	6.5	0.0	6.5	16.1	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	16.7	0.0	16.7	41.4	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.557	NA	NA	0.0	1.7	3.2
2	0.233	NA	NA	0.0	0.4	0.7
North: Mississippi Avenue						
1	0.544	NA	NA	0.4	1.4	2.6
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	0.2	0.4
2	0.324	NA	NA	0.0	0.6	1.2

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.557	NA	NA	0.0	44.9	81.5
2	0.233	NA	NA	0.0	10.4	19.0
North: Mississippi Avenue						
1	0.544	NA	NA	11.6	39.6	71.9
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	5.6	10.1
2	0.324	NA	NA	0.0	16.5	29.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.557	1.5	1.9	2.7	3.2	3.7	4.1	4.4
2	0.233	0.4	0.5	0.7	0.8	1.0	1.1	1.2
North: Mississippi Avenue								
1	0.544	1.4	1.8	2.5	2.9	3.4	3.8	4.0
West: Greenbag Road (CR 857)								
1	0.151	0.2	0.3	0.5	0.5	0.6	0.7	0.7
2	0.324	0.7	0.8	1.2	1.4	1.6	1.8	1.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.557	38.5	49.8	70.3	81.4	95.7	106.2	114.1
2	0.233	10.6	13.8	19.4	22.5	26.4	29.3	31.5
North: Mississippi Avenue								
1	0.544	38.0	49.2	69.4	80.3	94.5	104.9	112.7
West: Greenbag Road (CR 857)								
1	0.151	6.5	8.4	11.8	13.7	16.1	17.8	19.2
2	0.324	16.7	21.6	30.4	35.2	41.4	46.0	49.4

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.35	0.00	0.00	0.35	225.5	0.00	0.0	0.51	0.51
2	0.233	NA	NA	0.21	0.00	0.00	0.21	54.5	0.00	0.0	0.34	0.34
North: Mississippi Avenue												
1	0.544	NA	NA	0.74	0.24	0.00	0.98	324.8	0.48	157.1	0.74	1.22
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.21	0.00	0.00	0.21	35.5	0.00	0.0	0.33	0.33
2	0.324	NA	NA	0.27	0.00	0.00	0.27	101.1	0.00	0.0	0.40	0.40

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	645.3	255.8	901.2
%HV (all designations)	4.0	10.0	5.7
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	167.4	162.8	330.2
%HV (all designations)	18.0	11.0	14.5
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	170.9	376.7	547.7

```
 %HV (all designations)        5.0     2.0     2.9
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate           619.5   230.2   849.8
 Mov Class %          96.0    90.0    94.3
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate           137.3   144.9   282.2
 Mov Class %          82.0    89.0    85.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate           162.4   369.2   531.6
 Mov Class %          95.0    98.0    97.1
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

FLOW RATES for Heavy Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate            25.8    25.6    51.4
 Mov Class %           4.0    10.0     5.7
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate            30.1    17.9    48.0
 Mov Class %          18.0    11.0    14.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate             8.5     7.5    16.1
 Mov Class %           5.0     2.0     2.9
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-----------------------------------------
```

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	619.5	*	619.5
HV	25.8	*	25.8
Total	645.3	*	645.3
Lane 2			
LV	*	230.2	230.2
HV	*	25.6	25.6
Total	*	255.8	255.8
Approach	645.3	255.8	901.2

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	137.3	144.9	282.2
HV	30.1	17.9	48.0
Total	167.4	162.8	330.2
Approach	167.4	162.8	330.2

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	162.4	*	162.4
HV	8.5	*	8.5
Total	170.9	*	170.9
Lane 2			
LV	*	369.2	369.2
HV	*	7.5	7.5
Total	*	376.7	376.7
Approach	170.9	376.7	547.7

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT
Exit: EAST			
Lane: 1	506.5	37.7	544.2
Total	506.5	37.7	544.2
Exit: NORTH			
Lane: 1	392.6	34.1	426.7
Total	392.6	34.1	426.7
Exit: WEST			
Lane: 1	764.4	43.7	808.1
Total	764.4	43.7	808.1

* Movement not allocated to the lane

DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

Movement Class:	LV	HV	TOT
Exit: EAST			
Lane: 1	506.5	37.7	544.2
Total	506.5	37.7	544.2
Exit: NORTH			
Lane: 1	392.6	34.1	426.7
Total	392.6	34.1	426.7
Exit: WEST			
Lane: 1	764.4	43.7	808.1
Total	764.4	43.7	808.1

* Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

* Basic Parameters:
Intersection Type: Roundabout

```
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Thursday, April 11, 2019 10:16:19 AM
Project: C:\Users\msouthern\Desktop\Projects\18-141 WVDOH Greenbag Road PIE Study\06 Traffic\B - Analyses\2019-04-11 Updated Mississippi\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	539	2.0	0.466	8.1	LOS A	2.8	70.5	0.48	0.34	0.48	34.0
16	R2	191	0.0	0.162	4.5	LOS A	0.7	17.7	0.34	0.22	0.34	34.9
Approach		730	1.5	0.466	7.2	LOS A	2.8	70.5	0.44	0.31	0.44	34.2
North: Mississippi Avenue												
7	L2	59	0.0	0.202	6.7	LOS A	0.9	21.9	0.59	0.55	0.59	24.2
14	R2	99	1.0	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.0
Approach		158	0.6	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.4
West: Greenbag Road (CR 857)												
5	L2	203	1.0	0.153	4.0	LOS A	0.7	17.0	0.17	0.07	0.17	33.4
2	T1	720	1.0	0.541	8.5	LOS A	4.2	104.9	0.30	0.13	0.30	33.4
Approach		924	1.0	0.541	7.5	LOS A	4.2	104.9	0.27	0.12	0.27	33.4
All Vehicles		1812	1.2	0.541	7.3	LOS A	4.2	104.9	0.37	0.23	0.37	32.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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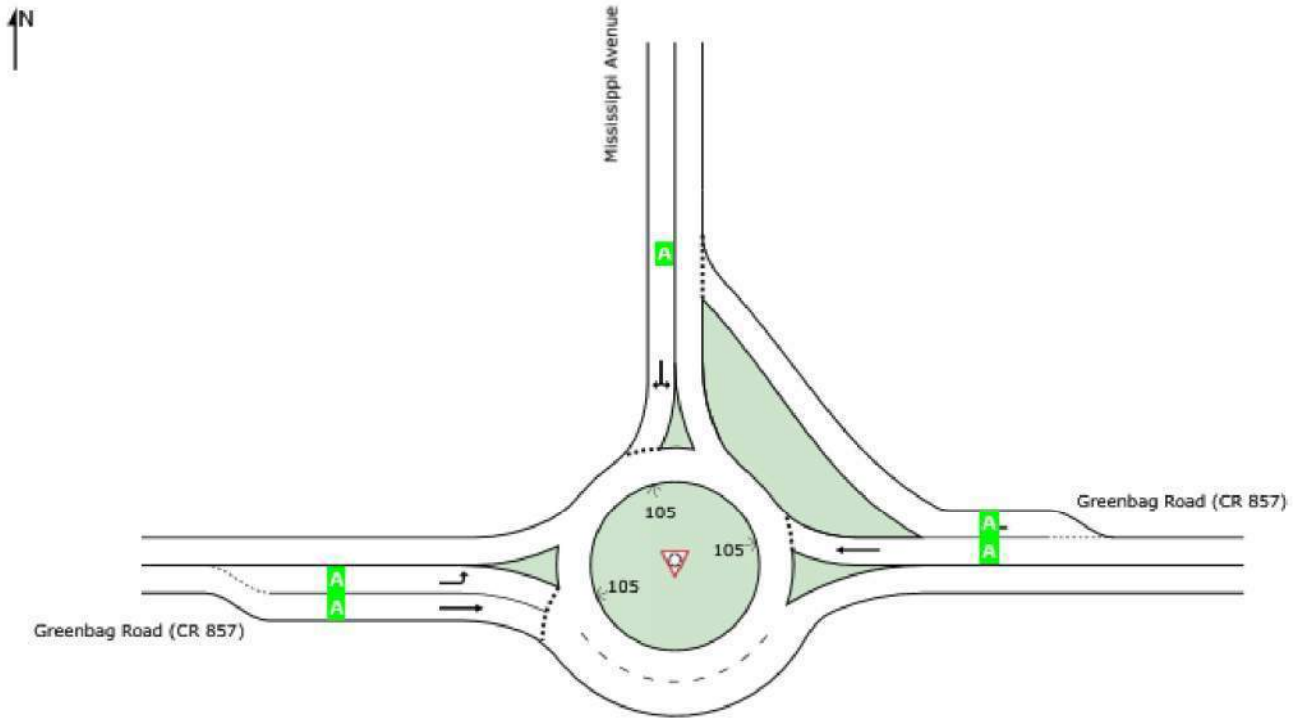
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

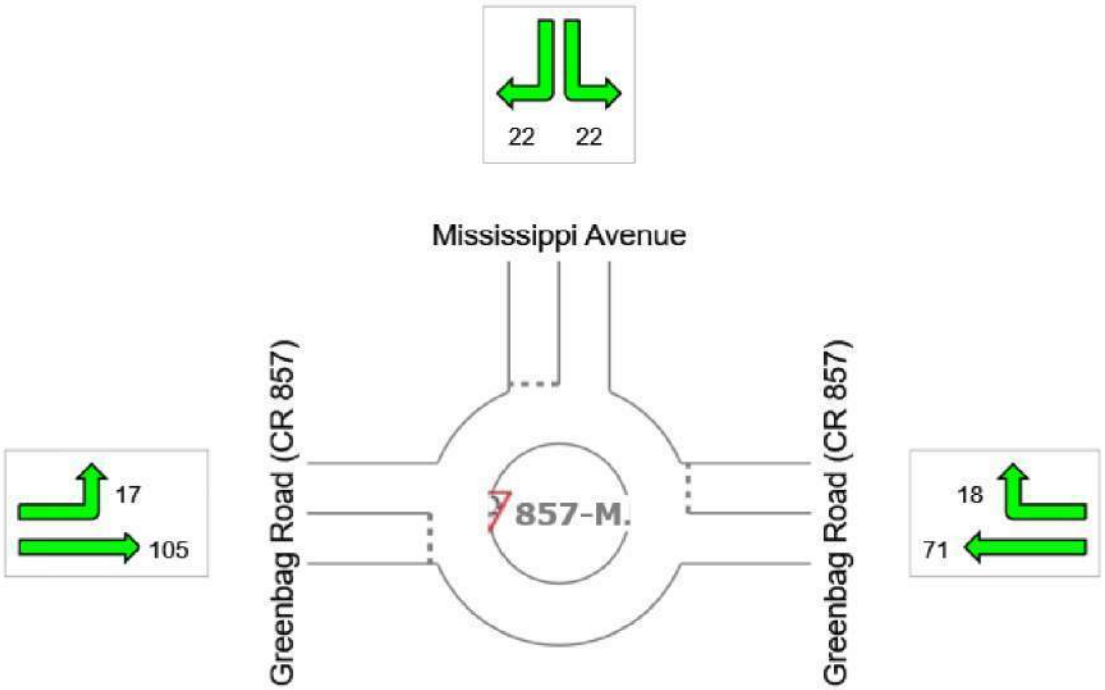
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	71	22	105	105



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

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- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

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- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
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- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

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- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	2	Excl. Slip	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

N	L2	1	Subdominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000
E	T1	2	Dominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000

Roundabout Capacity Model: US HCM 6

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
East: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	T1	1	Dominant	0.00	0.000	N	1.02	4.54	109.7	2.54
N	R2	2	Excl. Slip	0.00	0.000	N	1.00	4.54	109.7	2.54
North: Mississippi Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.00	4.98	187.6	2.61
W	R2	1	Dominant	0.00	0.000	N	1.01	4.98	187.6	2.61
West: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.01	4.54	106.9	2.54
E	T1	2	Dominant	0.00	0.000	N	1.01	4.54	106.9	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	203	205	100.0%
Total	203	205	
North: Mississippi Avenue			
1	539	549	100.0%
Total	539	549	
West: Greenbag Road (CR 857)			
1	59	59	100.0%
Total	59	59	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

EXITING LANE FLOW RATES

Lane No.	Exiting Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	203	205	100.0%
Total	203	205	

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
East: Greenbag Road (CR 857)			
1	0	539	539
2	191	0	191
Total	191	539	730

```
  North: Mississippi Avenue
  1            99       59      158
  Total        99       59      158
--------------------------------------
  West: Greenbag Road (CR 857)
  1             0      203      203
  2           720        0      720
  Total       720      203      923
--------------------------------------
```

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Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-----------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed   Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s     veh-mi/h    veh-mi/h   veh-h/h
-----------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1       36.7    34.0    3362.1#   67.4#     343.0       343.0      10.1
            North    R2       36.5    34.9    3269.1#   63.9#     118.5       118.5       3.4
-----------------------------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2       25.3    24.2    3331.6#   94.0#      37.3        37.3       1.5
             West    R2       24.1    23.0    3331.6#   98.6#      62.4        62.4       2.7
-----------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2       34.9    33.4    3464.3#   70.8#     133.3       133.3       4.0
             East    T1       36.9    33.4    3365.6#   68.7#     459.2       459.2      13.8
-----------------------------------------------------------------------------------------------
 ALL VEHICLES:                35.5    32.5    3362.5#   70.5#    1153.8      1153.8      35.5
-----------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                           Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed   Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1     218.2   25.7  162.1   1600     488     NA
            North    R2     156.0   22.6   69.1   1600     488     NA
-------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2      62.8   16.0  246.6   1600     488     NA
             West    R2     131.9   21.2   62.2   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2      67.3   16.5  264.3   1600     488     NA
             East    T1     175.9   23.7  165.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            ------------   ------------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed     Delay
 ID   Turn   mph     mph    mph   mph      mph       sec
-----------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1    40.0   25.7   25.7  40.0     29.4      0.0
   16  R2    40.0   22.6   22.6  40.0     29.2      0.0
-----------------------------------------------------------
North: Mississippi Avenue
    7  L2    25.0   16.0   16.0  25.0     18.6      0.0
   14  R2    25.0   21.2   21.2  25.0     18.6      0.0
-----------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2    40.0   16.5   16.5  40.0     26.5      0.0
    2  T1    40.0   23.7   23.7  40.0     38.1      0.0
-----------------------------------------------------------
```

```
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


MOVEMENT CAPACITY PARAMETERS

--------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
--------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1  #     539    203    205    1155   0.85     82  0.466
   16  R2  #     191    203    205    1178   0.85    423  0.162
--------------------------------------------------------------
North: Mississippi Avenue
    7  L2  #      59    539    549     293   0.85    321  0.202
   14  R2  #      99    539    549     490   0.85    321  0.202
--------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2  #     203     59     59    1332   0.85    457  0.153
    2  T1  #     720     59     59    1332   0.85     57  0.541*
--------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1   1.22    1.46     8.1   0.34   183.8 13.05    343.0    10.1     34.0
   16  R2   0.24    0.28     4.5   0.22    42.2  3.72    118.5     3.4     34.9
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
    7  L2   0.11    0.13     6.7   0.55    32.8  2.14     37.3     1.5     24.2
   14  R2   0.19    0.22     6.8   0.55    54.8  3.69     62.4     2.7     23.0
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2   0.22    0.27     4.0   0.07    13.8  4.18    133.3     4.0     33.4
    2  T1   1.71    2.05     8.5   0.13    96.7 17.08    459.2    13.8     33.4
-------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Total   Total    Total    Total    Total    Total
                  $/h     gal/h    kg/h     kg/h     kg/h     kg/h
-----------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1         157.59   19.4   174.0    0.21    0.016    0.272
   16  R2          47.34    4.0    35.3    0.05    0.003    0.012
                 ---------------------------------------------
                  204.93   23.4   209.3    0.26    0.019    0.284
-----------------------------------------------------------------
North: Mississippi Avenue
    7  L2          18.98    1.3    11.5    0.01    0.001    0.006
   14  R2          32.18    3.0    27.2    0.02    0.002    0.021
                 ---------------------------------------------
                   51.16    4.3    38.7    0.03    0.003    0.026
-----------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2          55.88    3.5    31.1    0.04    0.003    0.018
    2  T1         173.25   10.9    97.2    0.14    0.009    0.053
                 ---------------------------------------------
                  229.13   14.4   128.2    0.18    0.012    0.071
-----------------------------------------------------------------
 INTERSECTION:    485.22   42.1   376.2    0.46    0.035    0.382
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Rate    Eff.     Rate     Rate     Rate     Rate
                  $/mi    mpg      g/km     g/km     g/km     g/km
-----------------------------------------------------------------
```

```
East: Greenbag Road (CR 857)
    6  T1           0.29   17.7   315.2    0.38   0.029   0.492
   16  R2           0.25   29.9   185.0    0.25   0.017   0.064
                 ----------------------------------------------
                   0.28   19.7   281.7    0.35   0.026   0.382
--------------------------------------------------------------
North: Mississippi Avenue
    7  L2           0.32   28.8   192.1    0.12   0.016   0.098
   14  R2           0.32   20.5   270.3    0.19   0.022   0.205
                 ----------------------------------------------
                   0.32   23.0   241.0    0.16   0.020   0.165
--------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2           0.26   38.3   144.7    0.19   0.014   0.084
    2  T1           0.23   42.1   131.5    0.18   0.012   0.072
                 ----------------------------------------------
                   0.24   41.2   134.5    0.19   0.013   0.075
--------------------------------------------------------------
 INTERSECTION:     0.26   27.4   202.6    0.25   0.019   0.205
--------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

---------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.   95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
---------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         539  1155  0.466    8.1  0.34    2.8   70.5  1600.0
 2         191  1178  0.162    4.5  0.22    0.7   17.7   350.0T
---------------------------------------------------------------
 North: Mississippi Avenue
 1         158   783  0.202    6.8  0.55    0.9   21.9  1600.0
---------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         203  1332  0.153    4.0  0.07    0.7   17.0   225.0T
 2         720  1332  0.541    8.5  0.13    4.2  104.9  1600.0
---------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        539     150  1155   0.466  100
 2        191     150  1178   0.162  100
----------------------------------------
 North: Mississippi Avenue
 1        158     150   783   0.202  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        203     150  1332   0.153  100
 2        720     150  1332   0.541  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue     Length
        (veh/h)       Satf.    x     sec       ft       ft
------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        539      2          0.466    8.1     71      1600
 2        191      0          0.162    4.5     18       350
         ----------------------------------------------------
          730      1          0.466    7.2     71
------------------------------------------------------------
 North: Mississippi Avenue
 1        158      1          0.202    6.8     22      1600
```

```
        ----------------------------------------------------
          158      1          0.202    6.8     22
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        203      1          0.153    4.0     17      225
 2        720      1          0.541    8.5    105     1600
        ----------------------------------------------------
          924      1          0.541    7.5    105
=============================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1812      1          0.541    7.3    105
=============================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                          Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy   Spacing    Space    Time
          mph     veh/h    sec      ft        ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1       25.7    1420     2.54    95.59    25.40    1.86
 2      NA - Short Lane
-----------------------------------------------------------
 North: Mississippi Avenue
 1       19.3    1380     2.61    73.84    25.13    1.72
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7    1420     2.54    88.12    25.20    1.81
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                            ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.466    NA      NA     3.1   5.4   2.7   8.1   6.8   4.9   0.0   4.9   0.0    8.1
 2      0.162    NA      NA     3.1   3.9   0.6   4.5   4.8   2.8   0.0   2.8   0.0    4.5
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.202    NA      NA     4.6   5.6   1.2   6.8   4.3   4.3   0.0   4.3   0.0    6.8
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.153    NA      NA     2.7   3.5   0.5   4.0   5.0   3.1   0.0   3.1   0.0    4.0
 2      0.541    NA      NA     2.7   5.4   3.1   8.5   6.5   6.6   0.0   6.6   0.0    8.5
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.0	1.1	0.0	1.1	2.8	0.02	0.04	0.0	NA
2	0.162	NA	NA	0.0	0.3	0.0	0.3	0.7	0.02	0.05	NA	0.0
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	0.4	0.0	0.4	0.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	0.3	0.0	0.3	0.7	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	1.7	0.0	1.7	4.2	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.0	28.4	0.0	28.4	70.5	0.02	0.04	0.0	NA
2	0.162	NA	NA	0.0	7.1	0.0	7.1	17.7	0.02	0.05	NA	0.0
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	8.8	0.0	8.8	21.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	6.8	0.0	6.8	17.0	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	42.2	0.0	42.2	104.9	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.466	NA	NA	0.0	1.2	2.2
2	0.162	NA	NA	0.0	0.2	0.4
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	0.3	0.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	0.2	0.4
2	0.541	NA	NA	0.0	1.7	3.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.466	NA	NA	0.0	31.0	56.2
2	0.162	NA	NA	0.0	5.9	10.8
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	7.5	13.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	5.6	10.2
2	0.541	NA	NA	0.0	43.1	78.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.466	1.1	1.4	2.0	2.4	2.8	3.1	3.3
2	0.162	0.3	0.4	0.5	0.6	0.7	0.8	0.8
North: Mississippi Avenue								
1	0.202	0.4	0.5	0.6	0.7	0.9	1.0	1.0
West: Greenbag Road (CR 857)								
1	0.153	0.3	0.4	0.5	0.6	0.7	0.7	0.8
2	0.541	1.7	2.2	3.1	3.5	4.2	4.6	5.0

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.466	28.4	36.7	51.8	60.0	70.5	78.3	84.2
2	0.162	7.1	9.2	13.0	15.0	17.7	19.6	21.1
North: Mississippi Avenue								
1	0.202	8.8	11.4	16.1	18.7	21.9	24.3	26.2
West: Greenbag Road (CR 857)								
1	0.153	6.8	8.9	12.5	14.5	17.0	18.9	20.3
2	0.541	42.2	54.6	77.0	89.2	104.9	116.4	125.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.34	0.00	0.00	0.34	183.8	0.00	0.0	0.48	0.48
2	0.162	NA	NA	0.22	0.00	0.00	0.22	42.2	0.00	0.0	0.34	0.34
North: Mississippi Avenue												
1	0.202	NA	NA	0.55	0.00	0.00	0.55	87.6	0.00	0.0	0.59	0.59
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.07	0.00	0.00	0.07	13.8	0.00	0.0	0.17	0.17
2	0.541	NA	NA	0.13	0.00	0.00	0.13	96.7	0.00	0.0	0.30	0.30

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	538.7	191.4	730.1
%HV (all designations)	2.0	0.0	1.5
From NORTH To:	**E**	**W**	
Turn:	L2	R2	TOT
Flow Rate	59.1	98.9	158.1
%HV (all designations)	0.0	1.0	0.6
From WEST To:	**N**	**E**	
Turn:	L2	T1	TOT
Flow Rate	203.2	720.4	923.7

```
 %HV (all designations)        1.0     1.0     1.0
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate           527.9   191.4   719.3
 Mov Class %          98.0   100.0    98.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate            59.1    97.9   157.1
 Mov Class %         100.0    99.0    99.4
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate           201.2   713.2   914.4
 Mov Class %          99.0    99.0    99.0
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

FLOW RATES for Heavy Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate            10.8     0.0    10.8
 Mov Class %           2.0     0.0     1.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate             0.0     1.0     1.0
 Mov Class %           0.0     1.0     0.6
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate             2.0     7.2     9.2
 Mov Class %           1.0     1.0     1.0
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-----------------------------------------
```

```
 From EAST To:        W       N
 Turn:                T1      R2     TOT
----------------------------------------
 Lane  1
   LV              527.9       *   527.9
   HV               10.8       *    10.8
   Total           538.7       *   538.7
 Lane  2
   LV                 *   191.4   191.4
   Total              *   191.4   191.4
----------------------------------------
 Approach          538.7   191.4   730.1
----------------------------------------
 From NORTH To:       E       W
 Turn:                L2      R2     TOT
----------------------------------------
 Lane  1
   LV               59.1    97.9   157.1
   HV                  *     1.0     1.0
   Total            59.1    98.9   158.1
----------------------------------------
 Approach           59.1    98.9   158.1
----------------------------------------
 From WEST To:        N       E
 Turn:                L2      T1     TOT
----------------------------------------
 Lane  1
   LV              201.2       *   201.2
   HV                2.0       *     2.0
   Total           203.2       *   203.2
 Lane  2
   LV                 *   713.2   713.2
   HV                 *     7.2     7.2
   Total              *   720.4   720.4
----------------------------------------
 Approach          203.2   720.4   923.7
----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
```

```
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

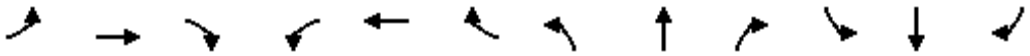
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SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Thursday, April 11, 2019 10:17:57 AM
Project: C:\Users\msouthern\Desktop\Projects\18-141 WVDOH Greenbag Road PIE Study\06 Traffic\B - Analyses\2019-04-11 Updated Mississippi\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

ENCLOSURE

- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn and Right Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.930			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1628	0	1678	1728	0	1788	1750	0	1684	1411	0
Flt Permitted	0.160			0.350			0.421			0.258		
Satd. Flow (perm)	264	1628	0	618	1728	0	792	1750	0	457	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			45			168	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	538	0	208	410	0	92	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

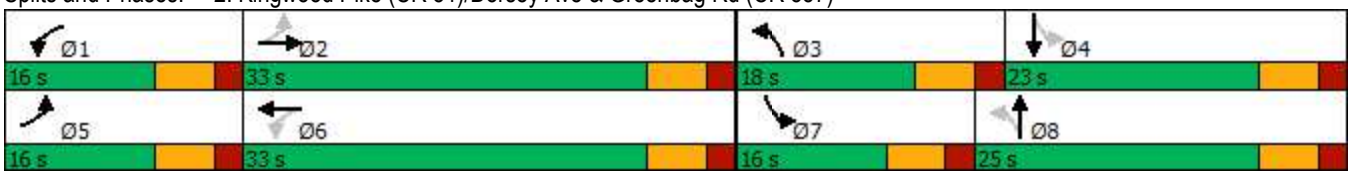


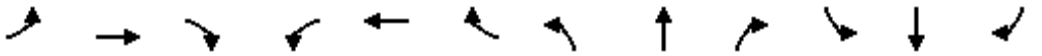
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		16.0	16.0		16.0	16.0	
Total Split (s)	16.0	33.0		16.0	33.0		18.0	25.0		16.0	23.0	
Total Split (%)	17.8%	36.7%		17.8%	36.7%		20.0%	27.8%		17.8%	25.6%	
Maximum Green (s)	10.0	27.0		10.0	27.0		12.0	19.0		10.0	17.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	36.2	31.3		32.8	27.7		28.2	19.5		22.3	13.9	
Actuated g/C Ratio	0.44	0.38		0.40	0.34		0.35	0.24		0.27	0.17	
v/c Ratio	0.31	0.70		0.10	0.91		0.51	0.91		0.37	0.52	
Control Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
LOS	B	C		B	D		C	E		C	B	
Approach Delay		29.5			49.9			45.2			16.2	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)	22	215		10	291		77	202		32	13	
Queue Length 95th (ft)	47	#387		26	#531		134	#408		66	74	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	282	627		399	588		426	452		289	433	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.70		0.09	0.91		0.49	0.91		0.32	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 81.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 38.3 Intersection LOS: D
Intersection Capacity Utilization 76.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

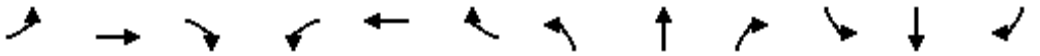




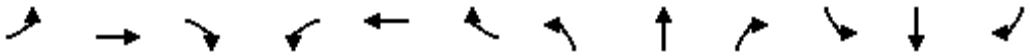
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1569	1584	1584	1904	1874	1874	2160	2160	2160	1611	1611	1611
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	211	486	46	241	576	23	399	247	218	226	38	228
Arrive On Green	0.05	0.34	0.34	0.03	0.32	0.32	0.11	0.23	0.23	0.06	0.19	0.19
Sat Flow, veh/h	1495	1425	135	1813	1788	73	2057	1059	933	1535	199	1197
Grp Volume(v), veh/h	75	0	438	34	0	538	208	0	410	92	0	196
Grp Sat Flow(s),veh/h/ln	1495	0	1560	1813	0	1861	2057	0	1992	1535	0	1396
Q Serve(g_s), s	2.4	0.0	18.9	0.9	0.0	20.2	5.8	0.0	14.6	3.5	0.0	9.7
Cycle Q Clear(g_c), s	2.4	0.0	18.9	0.9	0.0	20.2	5.8	0.0	14.6	3.5	0.0	9.7
Prop In Lane	1.00		0.09	1.00		0.04	1.00		0.47	1.00		0.86
Lane Grp Cap(c), veh/h	211	0	532	241	0	599	399	0	465	226	0	266
V/C Ratio(X)	0.35	0.00	0.82	0.14	0.00	0.90	0.52	0.00	0.88	0.41	0.00	0.74
Avail Cap(c_a), veh/h	335	0	574	426	0	684	514	0	516	337	0	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	22.1	17.7	0.0	23.7	20.9	0.0	27.1	22.7	0.0	28.0
Incr Delay (d2), s/veh	1.0	0.0	8.9	0.3	0.0	13.6	1.1	0.0	15.2	1.2	0.0	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	7.5	0.4	0.0	10.2	2.6	0.0	8.2	1.3	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	31.0	17.9	0.0	37.3	22.0	0.0	42.3	23.9	0.0	34.9
LnGrp LOS	B	A	C	B	A	D	C	A	D	C	A	C
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		29.3			36.2			35.5			31.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	31.1	13.9	20.0	9.9	29.6	10.7	23.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	27.0	12.0	17.0	10.0	27.0	10.0	19.0
Max Q Clear Time (g_c+I1), s	2.9	20.9	7.8	11.7	4.4	22.2	5.5	16.6
Green Ext Time (p_c), s	0.0	1.3	0.2	0.5	0.1	1.4	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.990			0.931			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1709	0	1762	1820	0	1736	1726	0	1667	1651	0
Flt Permitted	0.258			0.091			0.198			0.480		
Satd. Flow (perm)	460	1709	0	169	1820	0	362	1726	0	842	1651	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			33			27	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	505	0	79	163	0	149	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

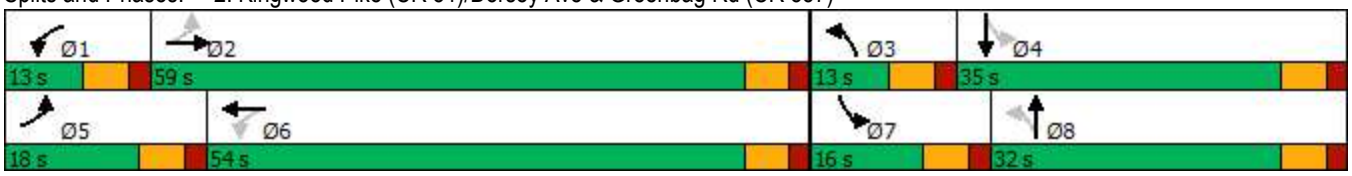


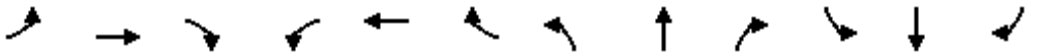
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	18.0	59.0		13.0	54.0		13.0	32.0		16.0	35.0	
Total Split (%)	15.0%	49.2%		10.8%	45.0%		10.8%	26.7%		13.3%	29.2%	
Maximum Green (s)	12.0	53.0		7.0	48.0		7.0	26.0		10.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	62.4	51.9		55.6	48.6		29.3	22.5		36.0	28.3	
Actuated g/C Ratio	0.54	0.45		0.48	0.42		0.25	0.19		0.31	0.25	
v/c Ratio	0.46	0.97		0.74	0.66		0.46	0.45		0.45	0.94	
Control Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
LOS	B	E		D	C		D	D		C	E	
Approach Delay		49.6			35.4			36.3			62.1	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	61	554		47	314		41	86		82	289	
Queue Length 95th (ft)	97	#811		#143	438		77	151		134	#479	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	384	799		178	774		176	417		334	438	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.94		0.74	0.65		0.45	0.39		0.45	0.91	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 115.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 47.3 Intersection LOS: D
Intersection Capacity Utilization 87.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

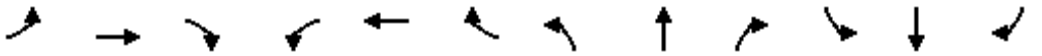




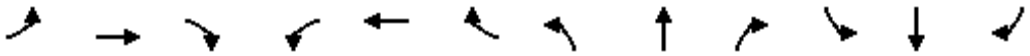
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1688	1673	1673	1979	1964	1964	2115	2130	2130	1597	1611	1611
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	4	3	3	1	0	0
Cap, veh/h	367	564	160	164	781	56	150	218	186	330	220	150
Arrive On Green	0.07	0.45	0.45	0.05	0.43	0.43	0.04	0.21	0.21	0.09	0.25	0.25
Sat Flow, veh/h	1608	1253	356	1884	1810	131	2015	1062	905	1521	894	608
Grp Volume(v), veh/h	164	0	750	131	0	505	79	0	163	149	0	400
Grp Sat Flow(s),veh/h/ln	1608	0	1609	1884	0	1940	2015	0	1967	1521	0	1502
Q Serve(g_s), s	6.6	0.0	53.0	4.5	0.0	23.5	3.6	0.0	8.4	9.0	0.0	29.0
Cycle Q Clear(g_c), s	6.6	0.0	53.0	4.5	0.0	23.5	3.6	0.0	8.4	9.0	0.0	29.0
Prop In Lane	1.00		0.22	1.00		0.07	1.00		0.46	1.00		0.41
Lane Grp Cap(c), veh/h	367	0	725	164	0	837	150	0	405	330	0	370
V/C Ratio(X)	0.45	0.00	1.03	0.80	0.00	0.60	0.53	0.00	0.40	0.45	0.00	1.08
Avail Cap(c_a), veh/h	412	0	725	173	0	837	181	0	435	330	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	32.3	27.6	0.0	25.7	36.9	0.0	40.5	32.6	0.0	44.3
Incr Delay (d2), s/veh	0.9	0.0	42.6	21.5	0.0	1.2	2.8	0.0	0.6	1.0	0.0	69.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	27.9	2.9	0.0	10.7	1.8	0.0	4.0	3.4	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	75.0	49.1	0.0	26.9	39.8	0.0	41.1	33.6	0.0	114.3
LnGrp LOS	B	A	F	D	A	C	D	A	D	C	A	F
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		65.1			31.5			40.7			92.4	
Approach LOS		E			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	59.0	11.2	35.0	14.7	56.7	16.0	30.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	53.0	7.0	29.0	12.0	48.0	10.0	26.0
Max Q Clear Time (g_c+I1), s	6.5	55.0	5.6	31.0	8.6	25.5	11.0	10.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	3.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	59.8
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	250		250	200		325	250		250	350		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1665	1273	1678	1734	1577	1788	1882	1600	1684	1772	1357
Flt Permitted	0.187			0.378			0.381			0.889		
Satd. Flow (perm)	308	1665	1273	668	1734	1577	717	1882	1600	1576	1772	1357
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			192			168
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

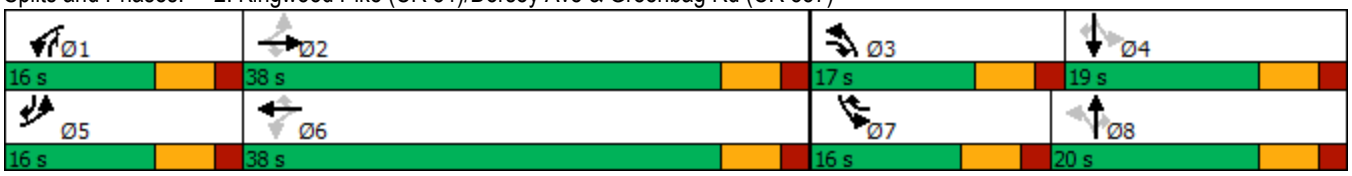


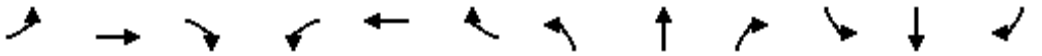
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	16.0	16.0	24.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	16.0	38.0	17.0	16.0	38.0	16.0	17.0	20.0	16.0	16.0	19.0	16.0
Total Split (%)	17.8%	42.2%	18.9%	17.8%	42.2%	17.8%	18.9%	22.2%	17.8%	17.8%	21.1%	17.8%
Maximum Green (s)	10.0	32.0	11.0	10.0	32.0	10.0	11.0	14.0	10.0	10.0	13.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	None	None	Min	None	None	None	None	None	None	None
Act Effct Green (s)	36.3	28.4	52.2	33.7	27.0	42.3	22.4	12.8	25.8	13.4	8.8	14.6
Actuated g/C Ratio	0.46	0.36	0.67	0.43	0.35	0.54	0.29	0.16	0.33	0.17	0.11	0.19
v/c Ratio	0.28	0.66	0.04	0.09	0.86	0.02	0.47	0.71	0.29	0.33	0.14	0.43
Control Delay	13.3	28.1	0.1	11.1	41.5	0.1	26.0	48.3	5.1	29.3	36.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	28.1	0.1	11.1	41.5	0.1	26.0	48.3	5.1	29.3	36.0	7.6
LOS	B	C	A	B	D	A	C	D	A	C	D	A
Approach Delay		23.8			38.2			27.4			17.3	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	20	177	0	9	256	0	84	115	0	48	15	0
Queue Length 95th (ft)	41	281	0	23	#442	0	147	#225	46	72	39	44
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	250		250	200		325	250		250	350		275
Base Capacity (vph)	323	741	898	458	751	934	463	357	727	319	312	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.54	0.04	0.07	0.69	0.02	0.45	0.61	0.26	0.29	0.09	0.39

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 78.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.1 Intersection LOS: C
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

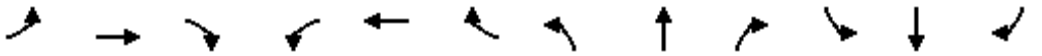




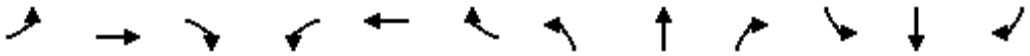
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1569	1584	1406	1904	1874	1979	2160	2160	2160	1611	1611	1448
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	19	5	7	0	1	1	1	0	0	11
Cap, veh/h	237	547	545	288	607	654	530	437	434	302	252	260
Arrive On Green	0.06	0.34	0.34	0.03	0.32	0.32	0.11	0.20	0.20	0.07	0.16	0.16
Sat Flow, veh/h	1495	1584	1192	1813	1874	1677	2057	2160	1831	1535	1611	1227
Grp Volume(v), veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Grp Sat Flow(s),veh/h/ln	1495	1584	1192	1813	1874	1677	2057	2160	1831	1535	1611	1227
Q Serve(g_s), s	2.2	15.1	1.2	0.8	17.6	0.5	5.6	6.1	6.1	3.4	1.0	8.5
Cycle Q Clear(g_c), s	2.2	15.1	1.2	0.8	17.6	0.5	5.6	6.1	6.1	3.4	1.0	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	547	545	288	607	654	530	437	434	302	252	260
V/C Ratio(X)	0.32	0.73	0.07	0.12	0.85	0.03	0.39	0.50	0.44	0.30	0.11	0.65
Avail Cap(c_a), veh/h	373	743	692	491	879	897	631	443	439	425	307	302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	19.6	10.4	15.7	21.5	12.8	20.3	24.1	22.2	22.0	24.7	24.5
Incr Delay (d2), s/veh	0.8	2.4	0.1	0.2	5.5	0.0	0.5	0.9	0.7	0.6	0.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.2	0.3	0.3	7.7	0.2	2.4	2.9	2.4	1.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	22.0	10.4	15.9	27.1	12.9	20.8	25.0	22.9	22.6	24.9	28.3
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	C	C
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		20.4			25.9			22.9			26.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	29.5	13.6	16.7	9.8	28.1	10.5	19.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	32.0	11.0	13.0	10.0	32.0	10.0	14.0
Max Q Clear Time (g_c+I1), s	2.8	17.1	7.6	10.5	4.2	19.6	5.4	8.1
Green Ext Time (p_c), s	0.0	2.1	0.2	0.2	0.1	2.5	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	250		250	200		325	250		250	350		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1764	1514	1762	1837	1577	1736	1846	1584	1667	1772	1477
Flt Permitted	0.285			0.163			0.442			0.696		
Satd. Flow (perm)	508	1764	1514	302	1837	1577	808	1846	1584	1221	1772	1477
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			166			109			109			162
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

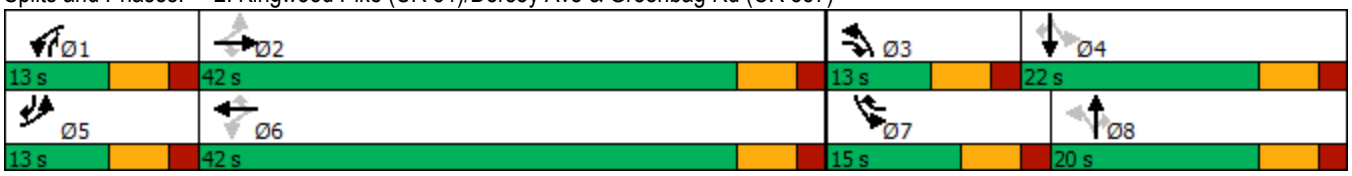


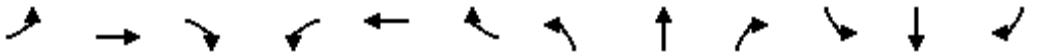
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	13.0	24.0	13.0	13.0	24.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	13.0	42.0	13.0	13.0	42.0	15.0	13.0	20.0	13.0	15.0	22.0	13.0
Total Split (%)	14.4%	46.7%	14.4%	14.4%	46.7%	16.7%	14.4%	22.2%	14.4%	16.7%	24.4%	14.4%
Maximum Green (s)	7.0	36.0	7.0	7.0	36.0	9.0	7.0	14.0	7.0	9.0	16.0	7.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	None	None	Min	None	None	None	None	None	None	None
Act Effct Green (s)	38.2	31.2	44.0	37.9	31.0	45.7	21.2	15.9	28.8	23.0	14.5	27.6
Actuated g/C Ratio	0.46	0.37	0.53	0.45	0.37	0.55	0.25	0.19	0.34	0.28	0.17	0.33
v/c Ratio	0.50	0.89	0.19	0.51	0.69	0.04	0.28	0.25	0.12	0.39	0.78	0.27
Control Delay	16.3	42.0	2.3	17.9	28.3	0.1	24.7	35.7	2.6	25.8	53.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	42.0	2.3	17.9	28.3	0.1	24.7	35.7	2.6	25.8	53.0	5.2
LOS	B	D	A	B	C	A	C	D	A	C	D	A
Approach Delay		30.2			24.6			21.8			31.5	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	44	291	0	34	211	0	31	45	0	62	129	0
Queue Length 95th (ft)	76	#466	26	62	312	0	64	89	15	110	#236	41
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	250		250	200		325	250		250	350		275
Base Capacity (vph)	332	769	881	261	801	920	283	357	620	392	343	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.76	0.19	0.50	0.59	0.04	0.28	0.25	0.12	0.38	0.69	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 83.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1688	1673	1688	1979	1964	1979	2115	2130	2145	1597	1611	1582
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	0	0	1	0	4	3	2	1	0	2
Cap, veh/h	370	653	635	264	726	797	240	265	344	345	284	351
Arrive On Green	0.09	0.39	0.39	0.06	0.37	0.37	0.05	0.12	0.12	0.11	0.18	0.18
Sat Flow, veh/h	1608	1673	1430	1884	1964	1677	2015	2130	1818	1521	1611	1340
Grp Volume(v), veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Grp Sat Flow(s),veh/h/ln	1608	1673	1430	1884	1964	1677	2015	2130	1818	1521	1611	1340
Q Serve(g_s), s	4.7	24.9	5.6	3.2	15.2	0.8	2.6	2.9	2.7	6.4	10.9	7.7
Cycle Q Clear(g_c), s	4.7	24.9	5.6	3.2	15.2	0.8	2.6	2.9	2.7	6.4	10.9	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	653	635	264	726	797	240	265	344	345	284	351
V/C Ratio(X)	0.44	0.89	0.26	0.50	0.65	0.04	0.33	0.33	0.22	0.43	0.84	0.46
Avail Cap(c_a), veh/h	380	791	752	315	928	969	317	391	452	365	338	396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.5	21.8	13.3	17.4	19.9	10.7	27.2	30.5	26.1	25.1	30.3	23.6
Incr Delay (d2), s/veh	0.8	11.1	0.2	1.4	1.0	0.0	0.8	0.7	0.3	0.9	14.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	10.6	1.6	1.3	6.4	0.3	1.2	1.4	1.1	2.3	5.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	32.9	13.6	18.9	21.0	10.7	27.9	31.2	26.4	26.0	44.8	24.5
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	D	C
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		26.2			20.0			28.7			33.7	
Approach LOS		C			B			C			C	

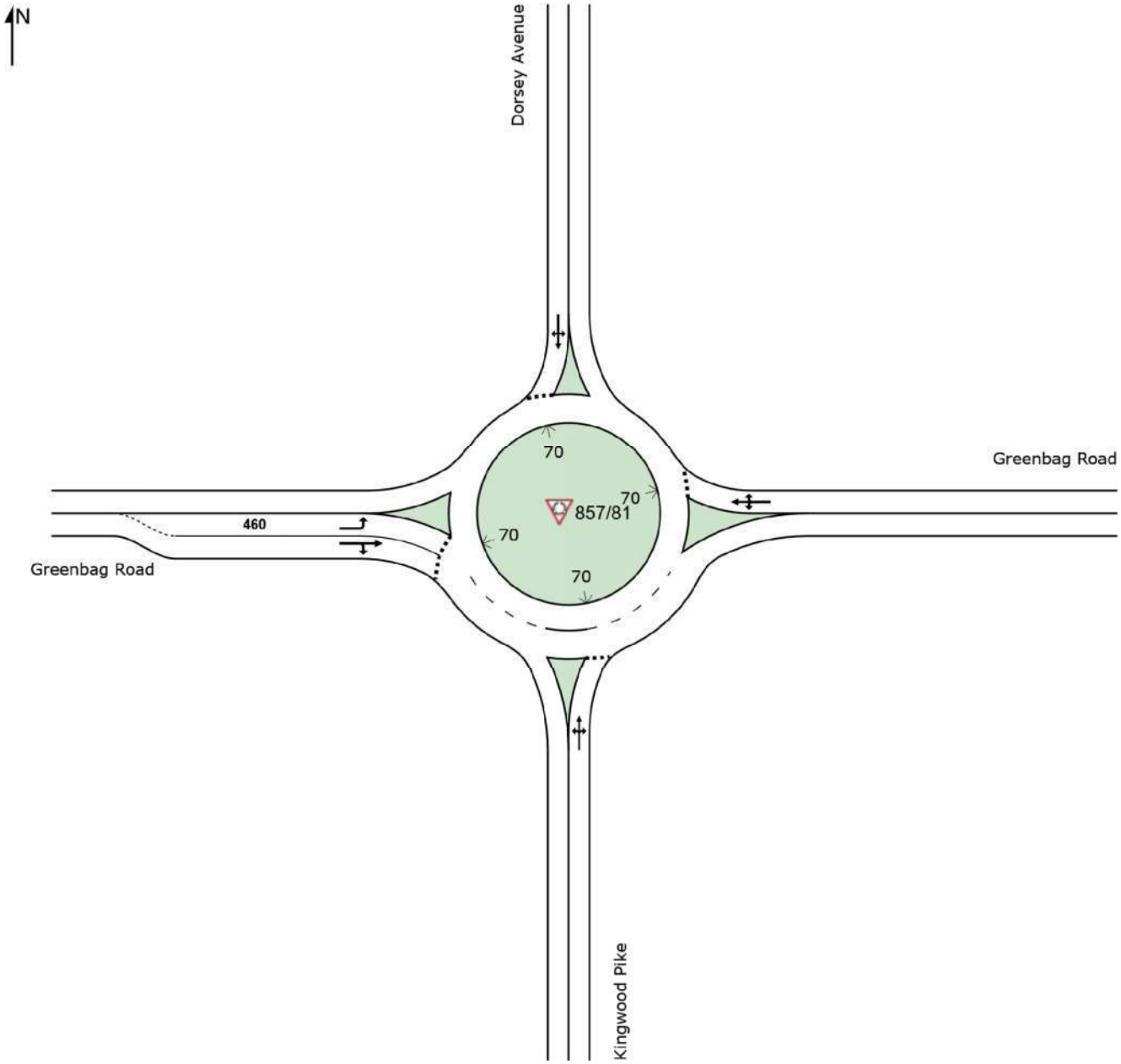
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	35.7	10.1	19.5	12.5	34.2	14.0	15.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	36.0	7.0	16.0	7.0	36.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	5.2	26.9	4.6	12.9	6.7	17.2	8.4	4.9
Green Ext Time (p_c), s	0.0	2.8	0.0	0.6	0.0	2.7	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

SITE LAYOUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout



MOVEMENT SUMMARY

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	208	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.9
8	T1	218	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	28.0
18	R2	192	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.4
Approach		618	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.8
East: Greenbag Road												
1	L2	34	5.0	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.7
6	T1	517	7.0	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.8
16	R2	21	0.0	0.744	20.4	LOS C	9.5	251.3	0.86	1.22	1.80	27.2
Approach		572	6.6	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.8
North: Dorsey Avenue												
7	L2	92	0.0	0.503	14.6	LOS B	2.9	76.5	0.76	0.89	1.16	29.5
4	T1	28	0.0	0.503	14.6	LOS B	2.9	76.5	0.76	0.89	1.16	29.6
14	R2	168	11.0	0.503	15.2	LOS B	2.9	76.5	0.76	0.89	1.16	28.9
Approach		289	6.4	0.503	15.0	LOS B	2.9	76.5	0.76	0.89	1.16	29.1
West: Greenbag Road												
5	L2	75	8.0	0.066	3.7	LOS A	0.2	6.5	0.27	0.14	0.27	32.8
2	T1	400	7.0	0.383	7.0	LOS A	1.9	51.7	0.37	0.23	0.37	33.4
12	R2	38	15.0	0.383	7.2	LOS A	1.9	51.7	0.37	0.23	0.37	32.3
Approach		513	7.7	0.383	6.5	LOS A	1.9	51.7	0.35	0.22	0.35	33.2
All Vehicles		1992	5.1	0.744	15.6	LOS B	9.5	251.3	0.71	0.89	1.32	29.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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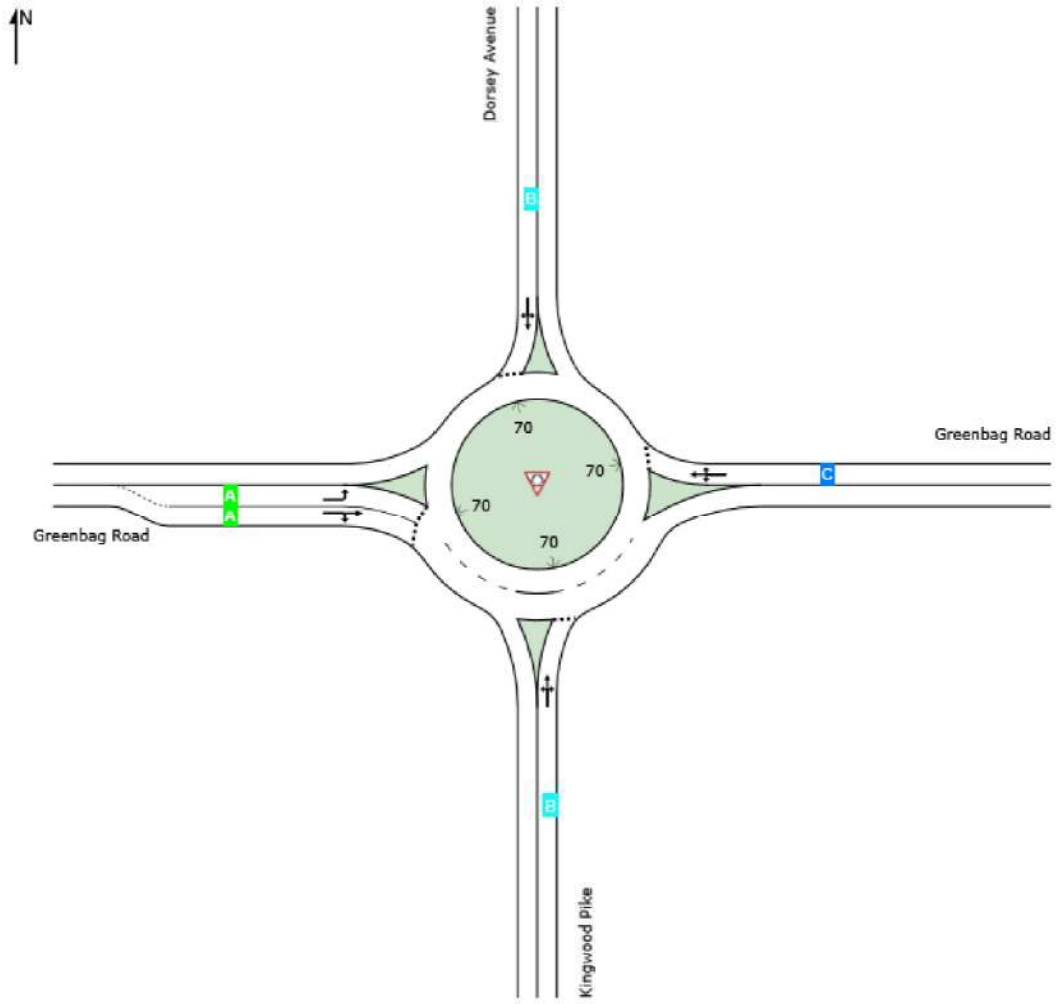
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	C	B	A	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

QUEUE DISTANCE (%ILE)

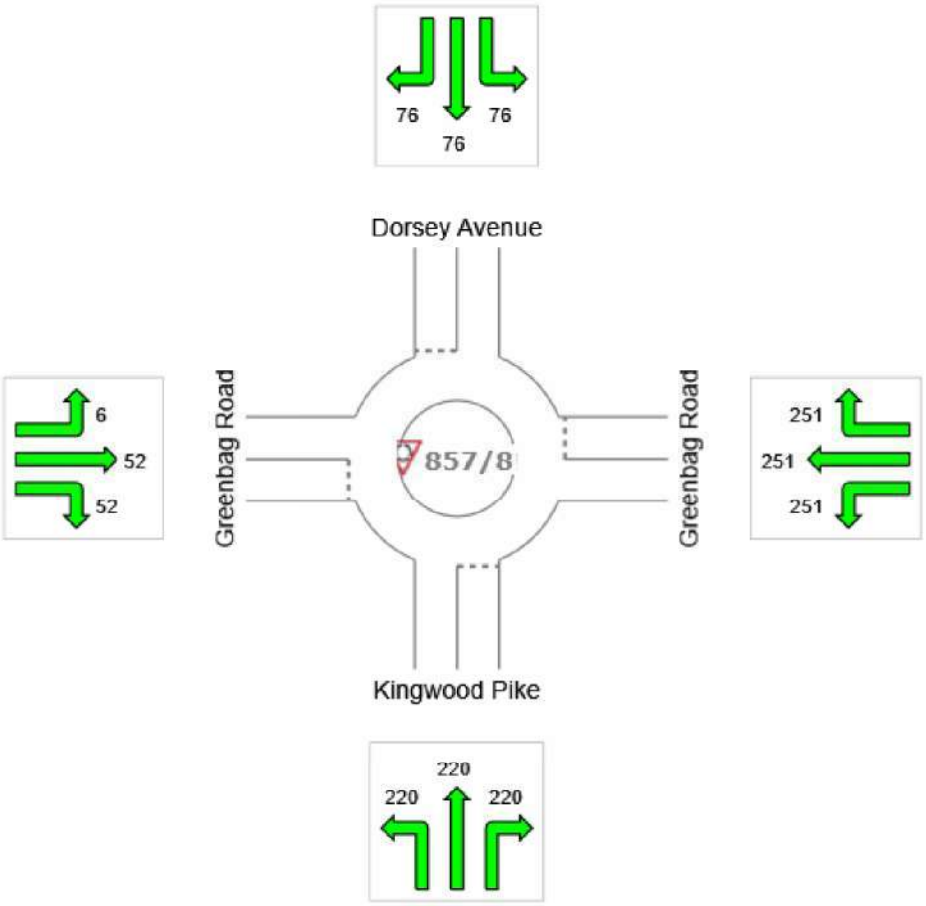
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	220	251	76	52	251



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

- Roundabouts
  - Roundabout Basic Parameters
  - Roundabout Circulating / Exiting Stream Parameters
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- Lanes
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Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0*	44.0*	142.0*	65.0*	30.0*	2	1	11.00*	1600	NA	0.0N
East: Greenbag Road										
70.0*	43.0*	141.0*	65.0*	30.0*	1	1	12.00*	1600	NA	0.0N
North: Dorsey Avenue										
70.0*	28.0*	142.0*	65.0*	30.0*	1	1	11.00*	1600	NA	0.0N
West: Greenbag Road										
70.0*	28.0*	141.0*	65.0*	30.0*	1	2	12.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
N	T1	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
E	R2	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
East: Greenbag Road													

```
  S   L2   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
  W   T1   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
  N   R2   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
-------------------------------------------------------------------------------------------------
North: Dorsey Avenue
  E   L2   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
  S   T1   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
  W   R2   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
-------------------------------------------------------------------------------------------------
West: Greenbag Road
  N   L2   1 Subdominant    154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
  E   T1   2 Dominant       154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
  S   R2   2 Dominant       154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for ------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                                 sec       ft     sec
-------------------------------------------------------------------------------------------
South: Kingwood Pike
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    L2    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
  N    T1    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
  E    R2    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
-------------------------------------------------------------------------------------------
East: Greenbag Road
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  S    L2    1 Dominant       0.00    0.000      N       1.05     4.98   125.6     2.61
  W    T1    1 Dominant       0.00    0.000      N       1.07     4.98   125.6     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.00     4.98   125.6     2.61
-------------------------------------------------------------------------------------------
North: Dorsey Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.00     4.98   142.2     2.61
  S    T1    1 Dominant       0.00    0.000      N       1.00     4.98   142.2     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.11     4.98   142.2     2.61
-------------------------------------------------------------------------------------------
West: Greenbag Road
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.08     4.54   108.7     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.07     4.54   108.7     2.54
  S    R2    2 Dominant       0.00    0.000      N       1.15     4.54   108.7     2.54
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

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Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane          Circulating Flow Rate
  No.          veh/h   pcu/h   Percent
----------------------------------------
  South: Kingwood Pike
  1              75      81     13.5%
  2             492     520     86.5%
  Total         567     601
----------------------------------------
  East: Greenbag Road
  1             501     511    100.0%
  Total         501     511
----------------------------------------
  North: Dorsey Avenue
  1             759     799    100.0%
  Total         759     799
----------------------------------------
  West: Greenbag Road
  1             154     156    100.0%
  Total         154     156
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
```

```
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  South: Kingwood Pike
  1           192      426      618
  Total       192      426      618
---------------------------------------
  East: Greenbag Road
  1            21      551      572
  Total        21      551      572
---------------------------------------
  North: Dorsey Avenue
  1           168      121      289
  Total       168      121      289
---------------------------------------
  West: Greenbag Road
  1             0       75       75
  2            38      400      438
  Total        38      475      513
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed  Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s    veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------------
South: Kingwood Pike
             West    L2       31.5    27.9    3325.7#   81.2#     130.8       130.8      4.7
            North    T1       31.5    28.0    3325.7#   81.1#     137.6       137.6      4.9
             East    R2       30.7    27.4    3325.7#   82.9#     121.2       121.2      4.4
-------------------------------------------------------------------------------------------------------
East: Greenbag Road
            South    L2       31.3    27.7    3332.3#   82.0#      21.3        21.3      0.8
             West    T1       31.4    27.8    3332.3#   81.7#     326.5       326.5     11.7
            North    R2       30.6    27.2    3332.3#   83.5#      13.0        13.0      0.5
-------------------------------------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2       33.6    29.5    3312.5#   76.5#      58.0        58.0      2.0
            South    T1       33.7    29.6    3312.5#   76.3#      17.7        17.7      0.6
             West    R2       32.8    28.9    3312.5#   78.3#     105.7       105.7      3.7
-------------------------------------------------------------------------------------------------------
West: Greenbag Road
            North    L2       34.0    32.8    3387.2#   70.5#      48.1        48.1      1.5
             East    T1       36.0    33.4    3324.9#   67.8#     251.9       251.9      7.5
            South    R2       34.7    32.3    3324.9#   70.1#      24.0        24.0      0.7
-------------------------------------------------------------------------------------------------------
 ALL VEHICLES:               32.7    29.2    3327.8#   77.7#    1255.7      1255.7     43.0
-------------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                          Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed  Dist    Dist   Dist   Dist
 Approach  Exit      Turn    ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
South: Kingwood Pike
             West    L2      47.8   14.5  187.8   1600     488     NA
            North    T1     123.9   20.8  128.6   1600     488     NA
             East    R2      84.2   17.9   55.3   1600     488     NA
-------------------------------------------------------------------------
East: Greenbag Road
            South    L2      50.9   14.8  199.8   1600     488     NA
             West    T1     141.2   21.8  131.2   1600     488     NA
            North    R2      83.8   17.9   54.9   1600     488     NA
-------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2      50.8   14.8  199.6   1600     488     NA
            South    T1     163.1   23.0  133.5   1600     488     NA
             West    R2     111.9   20.0   54.9   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road
            North    L2      47.7   14.4  187.2   1600     488     NA
```

```
            East    T1     140.0   21.7  131.0   1600     488     NA
           South    R2      97.7   19.0   54.7   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn    Negn Cruise    Speed    Delay
 ID   Turn   mph    mph     mph   mph       mph      sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.5   14.5  40.0     18.2      0.0
    8  T1     40.0   20.8   20.8  40.0     18.2      0.0
   18  R2     40.0   17.9   17.9  40.0     18.2      0.0
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     19.7      0.0
    6  T1     40.0   21.8   21.8  40.0     19.7      0.0
   16  R2     40.0   17.9   17.9  40.0     19.7      0.0
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     16.4      0.0
    4  T1     40.0   23.0   23.0  40.0     16.4      0.0
   14  R2     40.0   20.0   20.0  40.0     16.4      0.0
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.4   14.4  40.0     23.2      0.0
    2  T1     40.0   21.7   21.7  40.0     34.2      0.0
   12  R2     40.0   19.0   19.0  40.0     34.2      0.0
-----------------------------------------------------------
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #     208    567    601     283   0.85     16  0.733
    8  T1  #     218    567    601     298   0.85     16  0.733
   18  R2  #     192    567    601     262   0.85     16  0.733
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #      34    501    511      45   0.85     14  0.744*
    6  T1  #     517    501    511     695   0.85     14  0.744*
   16  R2  #      21    501    511      28   0.85     14  0.744*
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #      92    759    799     184   0.85     69  0.503
    4  T1  #      28    759    799      56   0.85     69  0.503
   14  R2  #     168    759    799     335   0.85     69  0.503
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #      75    154    156    1141   0.85   1193  0.066
    2  T1  #     400    154    156    1045   0.85    122  0.383
   12  R2  #      38    154    156      99   0.85    122  0.383
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   1.08    1.30    18.7   1.16   240.6 12.71    130.8     4.7     27.9
    8  T1   1.14    1.36    18.7   1.16   253.2 13.01    137.6     4.9     28.0
   18  R2   1.00    1.20    18.7   1.16   222.9 12.29    121.2     4.4     27.4
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.19    0.23    20.7   1.22    41.0  8.64     21.3     0.8     27.7
    6  T1   2.98    3.58    20.7   1.22   629.4 22.32    326.5    11.7     27.8
   16  R2   0.12    0.14    20.4   1.22    25.1  4.42     13.0     0.5     27.2
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

7	L2	0.37	0.45	14.6	0.89	82.0	3.45	58.0	2.0	29.5
4	T1	0.11	0.14	14.6	0.89	25.1	1.87	17.7	0.6	29.6
14	R2	0.71	0.86	15.2	0.89	149.5	6.53	105.7	3.7	28.9
West: Greenbag Road										
5	L2	0.08	0.09	3.7	0.14	10.7	1.54	48.1	1.5	32.8
2	T1	0.78	0.93	7.0	0.23	93.3	9.16	251.9	7.5	33.4
12	R2	0.08	0.09	7.2	0.23	8.9	2.29	24.0	0.7	32.3

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	68.53	4.0	35.3	0.04	0.004	0.024
8	T1	72.12	4.2	37.1	0.04	0.004	0.025
18	R2	64.37	5.5	48.7	0.06	0.005	0.038
		205.02	13.6	121.1	0.14	0.012	0.087
East: Greenbag Road							
1	L2	11.09	1.4	12.8	0.01	0.001	0.032
6	T1	164.22	9.3	83.3	0.10	0.010	0.146
16	R2	6.55	0.4	3.3	0.00	0.000	0.005
		181.86	11.1	99.4	0.11	0.011	0.183
North: Dorsey Avenue							
7	L2	37.05	4.2	37.5	0.04	0.003	0.081
4	T1	11.46	1.6	13.9	0.02	0.001	0.027
14	R2	66.86	6.2	55.7	0.06	0.006	0.148
		115.37	11.9	107.0	0.12	0.010	0.256
West: Greenbag Road							
5	L2	26.74	2.4	21.9	0.02	0.002	0.067
2	T1	153.70	21.6	195.6	0.19	0.015	0.736
12	R2	15.04	2.9	27.1	0.02	0.002	0.126
		195.48	27.0	244.7	0.24	0.019	0.928
INTERSECTION:		697.73	63.6	572.2	0.61	0.053	1.455

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.33	33.0	167.6	0.18	0.017	0.114
8	T1	0.33	33.0	167.6	0.18	0.017	0.114
18	R2	0.33	22.2	249.7	0.31	0.024	0.195
		0.33	28.7	193.1	0.22	0.019	0.139
East: Greenbag Road							
1	L2	0.32	15.1	375.3	0.42	0.034	0.926
6	T1	0.31	35.2	158.5	0.18	0.018	0.278
16	R2	0.31	35.5	156.8	0.17	0.017	0.255
		0.31	32.6	171.2	0.20	0.019	0.316
North: Dorsey Avenue							
7	L2	0.40	13.8	401.7	0.46	0.037	0.872
4	T1	0.40	11.4	486.4	0.56	0.048	0.932
14	R2	0.39	17.0	327.2	0.34	0.033	0.873
		0.40	15.2	366.6	0.40	0.036	0.878
West: Greenbag Road							
5	L2	0.35	19.7	283.3	0.29	0.027	0.861
2	T1	0.38	11.6	482.6	0.47	0.037	1.815
12	R2	0.39	8.2	702.3	0.59	0.048	3.264
		0.37	12.0	469.3	0.45	0.036	1.780
INTERSECTION:		0.35	19.7	283.1	0.30	0.026	0.720

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	618	843	0.733	18.7	1.16	8.7	220.0	1600.0
East: Greenbag Road								
1	572	768	0.744	20.7	1.22	9.5	251.3	1600.0
North: Dorsey Avenue								
1	289	574	0.503	15.0	0.89	2.9	76.5	1600.0
West: Greenbag Road								
1	75	1141	0.066	3.7	0.14	0.2	6.5	460.0T
2	438	1144	0.383	7.0	0.23	1.9	51.7	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	618	150	843	0.733	100
East: Greenbag Road					
1	572	150	768	0.744	100
North: Dorsey Avenue					
1	289	150	574	0.503	100
West: Greenbag Road					
1	75	75	1141	0.066	100
2	438	150	1144	0.383	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	618	1		0.733	18.7	220	1600
	618	1		0.733	18.7	220	
East: Greenbag Road							
1	572	7		0.744	20.7	251	1600
	572	7		0.744	20.7	251	
North: Dorsey Avenue							
1	289	6		0.503	15.0	76	1600
	289	6		0.503	15.0	76	
West: Greenbag Road							
1	75	8		0.066	3.7	6	460
2	438	8		0.383	7.0	52	1600
	513	8		0.383	6.5	52	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
1992	5	0.744	15.6	251

Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled

```
     intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout

-----------------------------------------------------
                                        Average  Driver
 Lane    Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       17.8   1420    2.54    66.05    25.20    1.57
-----------------------------------------------------
 East: Greenbag Road
 1       21.3   1380    2.61    81.31    26.33    1.76
-----------------------------------------------------
 North: Dorsey Avenue
 1       18.6   1380    2.61    71.23    26.28    1.65
-----------------------------------------------------
 West: Greenbag Road
 1      NA - Short Lane
 2       21.5   1420    2.54    79.92    26.54    1.69
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green           dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.733    NA      NA     4.3   7.9  10.8  18.7   4.7  14.8   5.7   9.1   0.0   18.7
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.744    NA      NA     4.7   8.4  12.3  20.7   5.9  15.7   6.2   9.4   0.0   20.7
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.503    NA      NA     6.3   8.8   6.2  15.0   4.2  11.8   2.4   9.4   0.0   15.0
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.066    NA      NA     3.2   3.5   0.2   3.7   4.6   2.5   0.0   2.5   0.0    3.7
 2      0.383    NA      NA     3.1   5.1   1.9   7.0   6.0   4.8   0.0   4.8   0.0    7.0
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)    Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green           No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.733    NA      NA     1.3    1.8   1.7    3.5    8.7  0.06   0.14    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.744    NA      NA     1.5    1.9   2.0    3.8    9.5  0.06   0.16    0.0    NA
-------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1    0.503    NA      NA     0.3    0.9   0.3    1.2    2.9  0.02   0.05    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
West: Greenbag Road												
1	0.066	NA	NA	0.0	0.1	0.0	0.1	0.2	0.01	0.01	NA	0.0
2	0.383	NA	NA	0.0	0.8	0.0	0.8	1.9	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.733	NA	NA	34.0	44.5	44.0	88.5	220.0	0.06	0.14	0.0	NA
East: Greenbag Road												
1	0.744	NA	NA	40.0	48.9	52.2	101.1	251.3	0.06	0.16	0.0	NA
North: Dorsey Avenue												
1	0.503	NA	NA	8.1	23.4	7.3	30.8	76.5	0.02	0.05	0.0	NA
West: Greenbag Road												
1	0.066	NA	NA	0.0	2.6	0.0	2.6	6.5	0.01	0.01	NA	0.0
2	0.383	NA	NA	0.0	20.8	0.0	20.8	51.7	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.733	NA	NA	1.3	3.2	5.8
East: Greenbag Road						
1	0.744	NA	NA	1.5	3.3	6.0
North: Dorsey Avenue						
1	0.503	NA	NA	0.3	1.2	2.2
West: Greenbag Road						
1	0.066	NA	NA	0.0	0.1	0.1
2	0.383	NA	NA	0.0	0.9	1.5

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.733	NA	NA	34.0	81.0	147.0
East: Greenbag Road						
1	0.744	NA	NA	40.0	86.7	157.2
North: Dorsey Avenue						
1	0.503	NA	NA	8.1	31.6	57.3
West: Greenbag Road						
1	0.066	NA	NA	0.0	2.1	3.7
2	0.383	NA	NA	0.0	22.6	41.0

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								

1	0.733	3.5	4.5	6.4	7.4	8.7	9.7	10.4
East: Greenbag Road								
1	0.744	3.8	5.0	7.0	8.1	9.5	10.6	11.4
North: Dorsey Avenue								
1	0.503	1.2	1.5	2.1	2.5	2.9	3.2	3.5
West: Greenbag Road								
1	0.066	0.1	0.1	0.2	0.2	0.2	0.3	0.3
2	0.383	0.8	1.0	1.4	1.7	1.9	2.2	2.3

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.733	88.5	114.6	161.6	187.1	220.0	244.2	262.5
East: Greenbag Road								
1	0.744	101.1	130.9	184.6	213.7	251.3	279.0	299.9
North: Dorsey Avenue								
1	0.503	30.7	39.8	56.2	65.0	76.5	84.9	91.2
West: Greenbag Road								
1	0.066	2.6	3.4	4.8	5.5	6.5	7.2	7.7
2	0.383	20.8	26.9	38.0	44.0	51.7	57.4	61.7

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.733	NA	NA	0.84	0.32	0.00	1.16	716.6	0.90	554.6	0.84	1.74
East: Greenbag Road												
1	0.744	NA	NA	0.86	0.35	0.00	1.22	695.5	0.94	537.6	0.86	1.80
North: Dorsey Avenue												
1	0.503	NA	NA	0.76	0.13	0.00	0.89	256.6	0.40	116.5	0.76	1.16
West: Greenbag Road												
1	0.066	NA	NA	0.14	0.00	0.00	0.14	10.7	0.00	0.0	0.27	0.27
2	0.383	NA	NA	0.23	0.00	0.00	0.23	102.2	0.00	0.0	0.37	0.37

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	207.6	218.5	192.4	618.5
%HV (all designations)	1.0	1.0	1.0	1.0
From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	33.7	517.4	20.7	571.7
%HV (all designations)	5.0	7.0	0.0	6.6
From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	168.5	289.1

%HV (all designations)	0.0	0.0	11.0	6.4

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	75.0	400.0	38.0	513.0
%HV (all designations)	8.0	7.0	15.0	7.7

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

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Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	205.5	216.3	190.5	612.3
Mov Class %	99.0	99.0	99.0	99.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	32.0	481.2	20.7	533.8
Mov Class %	95.0	93.0	100.0	93.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	149.9	270.6
Mov Class %	100.0	100.0	89.0	93.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	69.0	372.0	32.3	473.3
Mov Class %	92.0	93.0	85.0	92.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	2.1	2.2	1.9	6.2
Mov Class %	1.0	1.0	1.0	1.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	1.7	36.2	0.0	37.9
Mov Class %	5.0	7.0	0.0	6.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	18.5	18.5
Mov Class %	0.0	0.0	11.0	6.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	6.0	28.0	5.7	39.7
Mov Class %	8.0	7.0	15.0	7.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

```
--------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             205.5   216.3   190.5   612.3
   HV               2.1     2.2     1.9     6.2
   Total          207.6   218.5   192.4   618.5
-------------------------------------------------
 Approach         207.6   218.5   192.4   618.5
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              32.0   481.2    20.7   533.8
   HV               1.7    36.2       *    37.9
   Total           33.7   517.4    20.7   571.7
-------------------------------------------------
 Approach          33.7   517.4    20.7   571.7
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              92.4    28.3   149.9   270.6
   HV                 *       *    18.5    18.5
   Total           92.4    28.3   168.5   289.1
-------------------------------------------------
 Approach          92.4    28.3   168.5   289.1
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              69.0       *       *    69.0
   HV               6.0       *       *     6.0
   Total           75.0       *       *    75.0
 Lane  2
   LV                 *   372.0    32.3   404.3
   HV                 *    28.0     5.7    33.7
   Total              *   400.0    38.0   438.0
-------------------------------------------------
 Approach          75.0   400.0    38.0   513.0
-------------------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
Lane:  1           654.9    29.9   684.8
Total              654.9    29.9   684.8
-----------------------------------------
 Exit: NORTH
Lane:  1           305.9     8.2   314.1
Total              305.9     8.2   314.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
```

```
Lane:  1           654.9    29.9   684.8
Total              654.9    29.9   684.8
-----------------------------------------
 Exit: NORTH
Lane:  1           305.9     8.2   314.1
Total              305.9     8.2   314.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

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Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:25:49 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\LOS & Q\2048 Build\2019-04-04 Revised Roundabouts\Greenbag & Dorsey\Greenbag & Dorsey Roundabout HCM 6 - With Luckey to Remain.sip8

MOVEMENT SUMMARY

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	79	4.0	0.378	11.0	LOS B	1.7	43.1	0.67	0.73	0.87	30.9
8	T1	88	3.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.9
18	R2	75	2.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.2
Approach		242	3.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.7
East: Greenbag Road												
1	L2	131	0.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.2
6	T1	471	1.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.2
16	R2	34	0.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	29.4
Approach		636	0.7	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.1
North: Dorsey Avenue												
7	L2	149	1.0	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.3
4	T1	238	0.0	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.4
14	R2	162	2.0	0.811	28.1	LOS C	10.8	270.8	0.94	1.38	2.24	24.9
Approach		549	0.9	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.2
West: Greenbag Road												
5	L2	164	0.0	0.186	5.9	LOS A	0.8	19.0	0.53	0.48	0.53	31.8
2	T1	584	1.0	0.855	27.2	LOS C	17.2	432.3	1.00	1.56	2.51	25.8
12	R2	166	0.0	0.855	27.2	LOS C	17.2	432.3	1.00	1.56	2.51	25.3
Approach		915	0.6	0.855	23.4	LOS C	17.2	432.3	0.91	1.37	2.16	26.6
All Vehicles		2342	1.0	0.855	20.6	LOS C	17.2	432.3	0.86	1.17	1.79	27.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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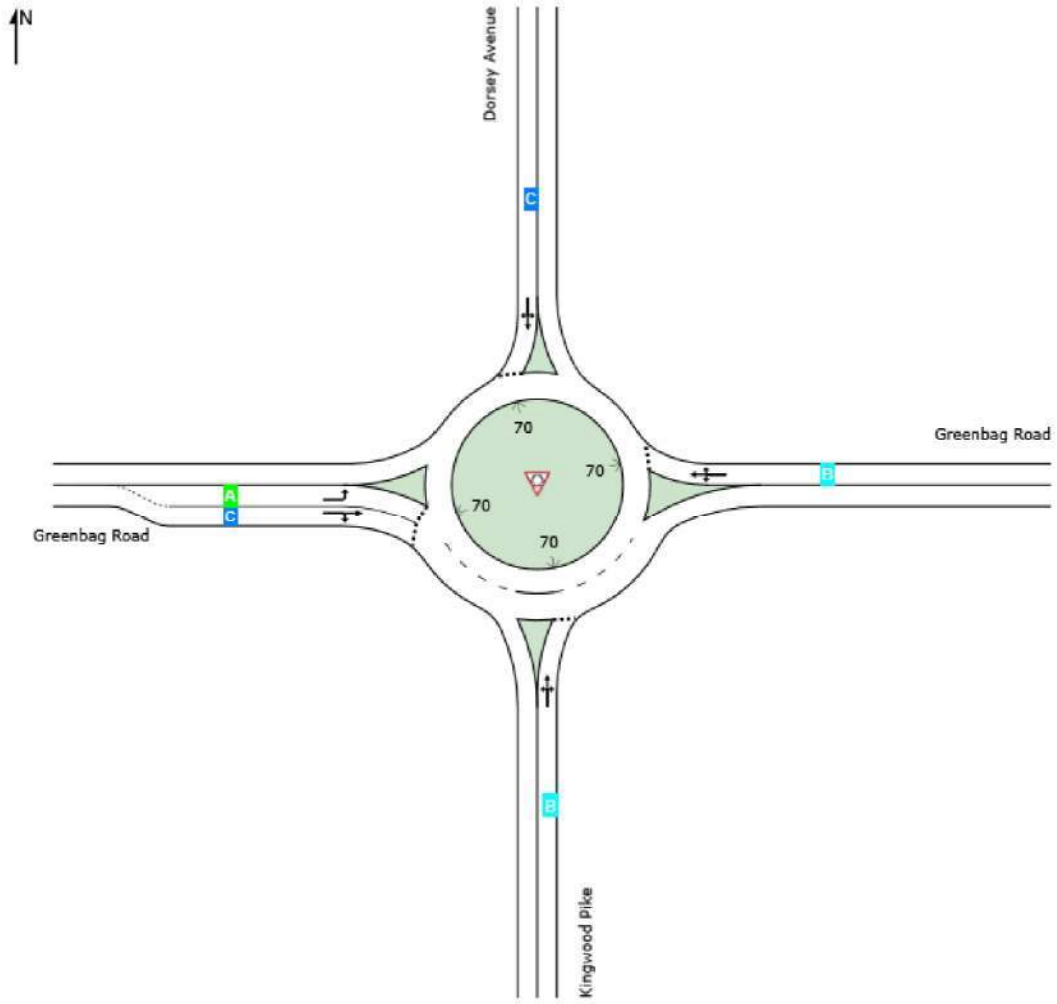
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	B	C	C	C



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

QUEUE DISTANCE (%ILE)

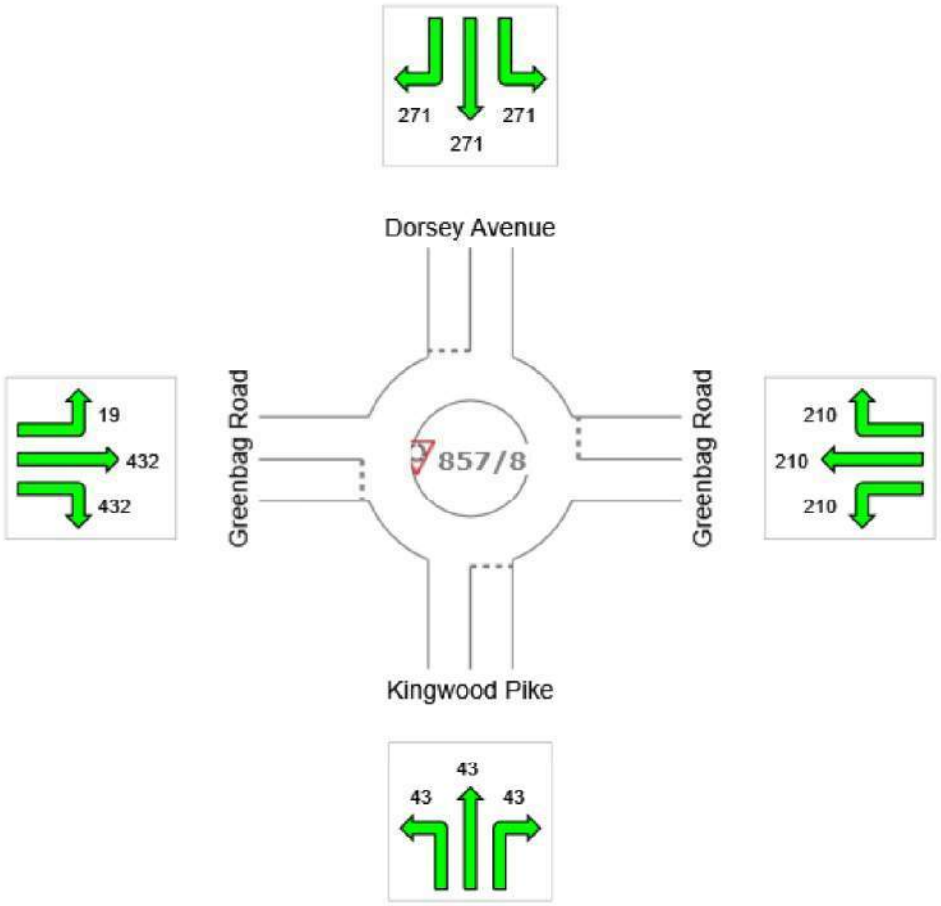
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	43	210	271	432	432



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

- Roundabouts
  - Roundabout Basic Parameters
  - Roundabout Circulating / Exiting Stream Parameters
  - Roundabout Gap Acceptance Parameters
  - Roundabout Flow Rates
- Movements
  - Intersection Negotiation and Travel Data
  - Movement Capacity and Performance Parameters
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- Lanes
  - Lane Performance and Capacity Information
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  - Driver Characteristics
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  - Lane Stops
- Flow Rates
  - Origin-Destination Flow Rates (Total)
  - Origin-Destination Flow Rates by Movement Class
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- Other
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  - Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0*	44.0*	142.0*	65.0*	30.0*	2	1	11.00*	1600	NA	0.0N
East: Greenbag Road										
70.0*	43.0*	141.0*	65.0*	30.0*	1	1	12.00*	1600	NA	0.0N
North: Dorsey Avenue										
70.0*	28.0*	142.0*	65.0*	30.0*	1	1	11.00*	1600	NA	0.0N
West: Greenbag Road										
70.0*	28.0*	141.0*	65.0*	30.0*	1	2	12.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
N	T1	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
E	R2	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
East: Greenbag Road													

S	L2	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
W	T1	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
N	R2	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
North: Dorsey Avenue													
E	L2	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
S	T1	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
W	R2	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
West: Greenbag Road													
N	L2	1	Subdominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000
E	T1	2	Dominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000
S	R2	2	Dominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000

Roundabout Capacity Model: US HCM 6

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Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	L2	1	Dominant	0.00	0.000	N	1.04	4.33	122.2	2.54
N	T1	1	Dominant	0.00	0.000	N	1.03	4.33	122.2	2.54
E	R2	1	Dominant	0.00	0.000	N	1.02	4.33	122.2	2.54
East: Greenbag Road										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
S	L2	1	Dominant	0.00	0.000	N	1.00	4.98	117.7	2.61
W	T1	1	Dominant	0.00	0.000	N	1.01	4.98	117.7	2.61
N	R2	1	Dominant	0.00	0.000	N	1.00	4.98	117.7	2.61
North: Dorsey Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.01	4.98	143.1	2.61
S	T1	1	Dominant	0.00	0.000	N	1.00	4.98	143.1	2.61
W	R2	1	Dominant	0.00	0.000	N	1.02	4.98	143.1	2.61
West: Greenbag Road										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.00	4.54	123.8	2.54
E	T1	2	Dominant	0.00	0.000	N	1.01	4.54	123.8	2.54
S	R2	2	Dominant	0.00	0.000	N	1.00	4.54	123.8	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

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Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	164	164	18.1%
2	734	741	81.9%
Total	898	905	
East: Greenbag Road			
1	330	336	100.0%
Total	330	336	
North: Dorsey Avenue			
1	681	689	100.0%
Total	681	689	
West: Greenbag Road			
1	519	521	100.0%
Total	519	521	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the

```
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  South: Kingwood Pike
  1            75      167      242
  Total        75      167      242
---------------------------------------
  East: Greenbag Road
  1            34      602      636
  Total        34      602      636
---------------------------------------
  North: Dorsey Avenue
  1           162      387      549
  Total       162      387      549
---------------------------------------
  West: Greenbag Road
  1             0      164      164
  2           166      585      751
  Total       166      749      915
---------------------------------------
```

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Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed  Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s    veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------------
South: Kingwood Pike
             West    L2       34.0    30.9    3324.6#   73.4#      49.5        49.5      1.6
            North    T1       34.0    30.9    3324.6#   73.3#      55.2        55.2      1.8
             East    R2       33.1    30.2    3324.6#   75.0#      47.4        47.4      1.6
-------------------------------------------------------------------------------------------------------
East: Greenbag Road
            South    L2       32.9    30.2    3341.4#   75.4#      83.2        83.2      2.8
             West    T1       32.9    30.2    3341.4#   75.5#     297.9       297.9      9.9
            North    R2       32.0    29.4    3341.4#   77.4#      21.3        21.3      0.7
-------------------------------------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2       30.6    25.3    3328.6#   89.6#      94.2        94.2      3.7
            South    T1       30.8    25.4    3328.6#   89.4#     150.2       150.2      5.9
             West    R2       30.0    24.9    3328.6#   91.2#     102.0       102.0      4.1
-------------------------------------------------------------------------------------------------------
West: Greenbag Road
            North    L2       33.5    31.8    3387.2#   72.5#     105.2       105.2      3.3
             East    T1       29.7    25.8    3314.0#   87.5#     366.7       366.7     14.2
            South    R2       29.1    25.3    3314.0#   89.2#     104.4       104.4      4.1
-------------------------------------------------------------------------------------------------------
 ALL VEHICLES:               31.4    27.5    3331.1#   82.5#    1477.3      1477.3     53.7
-------------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                          Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed   Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
South: Kingwood Pike
             West    L2      47.8   14.5  187.8   1600     488     NA
            North    T1     123.9   20.8  128.6   1600     488     NA
             East    R2      84.2   17.9   55.3   1600     488     NA
-------------------------------------------------------------------------
East: Greenbag Road
            South    L2      50.9   14.8  199.8   1600     488     NA
             West    T1     141.2   21.8  131.2   1600     488     NA
            North    R2      83.8   17.9   54.9   1600     488     NA
-------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2      50.8   14.8  199.6   1600     488     NA
            South    T1     163.1   23.0  133.5   1600     488     NA
             West    R2     111.9   20.0   54.9   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road
            North    L2      47.7   14.4  187.2   1600     488     NA
```

```
            East    T1     140.0   21.7  131.0   1600     488     NA
           South    R2      97.7   19.0   54.7   1600     488     NA
------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-------------------------------------------------------
           App. Speeds    Exit Speeds    Queue
           -----------    -----------   Move-up   Geom
 Mov       Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph      mph       sec
-------------------------------------------------------
South: Kingwood Pike
    3  L2    40.0   14.5   14.5  40.0     15.6      0.0
    8  T1    40.0   20.8   20.8  40.0     15.6      0.0
   18  R2    40.0   17.9   17.9  40.0     15.6      0.0
-------------------------------------------------------
East: Greenbag Road
    1  L2    40.0   14.8   14.8  40.0     23.1      0.0
    6  T1    40.0   21.8   21.8  40.0     23.1      0.0
   16  R2    40.0   17.9   17.9  40.0     23.1      0.0
-------------------------------------------------------
North: Dorsey Avenue
    7  L2    40.0   14.8   14.8  40.0     17.0      0.0
    4  T1    40.0   23.0   23.0  40.0     17.0      0.0
   14  R2    40.0   20.0   20.0  40.0     17.0      0.0
-------------------------------------------------------
West: Greenbag Road
    5  L2    40.0   14.4   14.4  40.0     19.2      0.0
    2  T1    40.0   21.7   21.7  40.0     19.3      0.0
   12  R2    40.0   19.0   19.0  40.0     19.3      0.0
-------------------------------------------------------
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      79    898    905     208   0.85    125  0.378
    8  T1  #      88    898    905     232   0.85    125  0.378
   18  R2  #      75    898    905     199   0.85    125  0.378
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #     131    330    336     201   0.85     30  0.654
    6  T1  #     471    330    336     720   0.85     30  0.654
   16  R2  #      34    330    336      52   0.85     30  0.654
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     149    681    689     184   0.85      5  0.811
    4  T1  #     238    681    689     294   0.85      5  0.811
   14  R2  #     162    681    689     200   0.85      5  0.811
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #     164    519    521     884   0.85    358  0.186
    2  T1  #     584    519    521     683   0.85     -1  0.855*
   12  R2  #     166    519    521     194   0.85     -1  0.855*
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.24    0.29    11.0   0.73    57.8  3.15     49.5     1.6     30.9
    8  T1   0.27    0.32    10.9   0.73    64.4  3.36     55.2     1.8     30.9
   18  R2   0.23    0.27    10.9   0.73    55.3  3.07     47.4     1.6     30.2
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.50    0.60    13.7   0.88   116.2  6.58     83.2     2.8     30.2
    6  T1   1.79    2.15    13.7   0.88   416.0 18.25    297.9     9.9     30.2
   16  R2   0.13    0.15    13.7   0.88    29.8  4.18     21.3     0.7     29.4
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

7	L2	1.16	1.40	28.0	1.38	205.5	13.32	94.2	3.7	25.3
4	T1	1.85	2.22	28.0	1.38	327.6	11.75	150.2	5.9	25.4
14	R2	1.26	1.51	28.1	1.38	222.5	13.71	102.0	4.1	24.9
West: Greenbag Road										
5	L2	0.27	0.32	5.9	0.48	79.3	3.65	105.2	3.3	31.8
2	T1	4.42	5.30	27.2	1.56	911.7	32.48	366.7	14.2	25.8
12	R2	1.26	1.51	27.2	1.56	259.5	12.22	104.4	4.1	25.3

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	23.32	1.5	13.2	0.01	0.001	0.016
8	T1	25.98	1.6	14.7	0.02	0.002	0.018
18	R2	22.67	2.1	19.3	0.02	0.002	0.025
		71.98	5.3	47.2	0.05	0.005	0.060
East: Greenbag Road							
1	L2	39.01	4.5	40.5	0.05	0.004	0.021
6	T1	135.52	7.6	68.1	0.07	0.007	0.031
16	R2	9.70	0.5	4.9	0.01	0.000	0.002
		184.23	12.7	113.4	0.13	0.012	0.054
North: Dorsey Avenue							
7	L2	65.06	6.5	57.8	0.07	0.006	0.052
4	T1	104.74	12.5	111.2	0.14	0.012	0.085
14	R2	69.71	5.5	49.2	0.05	0.005	0.043
		239.51	24.5	218.3	0.26	0.023	0.179
West: Greenbag Road							
5	L2	55.94	4.2	37.3	0.04	0.004	0.016
2	T1	241.29	24.4	217.7	0.26	0.022	0.206
12	R2	69.40	8.5	75.3	0.09	0.008	0.060
		366.63	37.1	330.2	0.40	0.034	0.283
INTERSECTION:		862.34	79.6	709.1	0.85	0.074	0.576

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.29	33.5	165.8	0.19	0.017	0.207
8	T1	0.29	33.5	165.6	0.18	0.017	0.204
18	R2	0.30	22.0	252.6	0.31	0.023	0.327
		0.29	28.8	192.8	0.22	0.019	0.243
East: Greenbag Road							
1	L2	0.29	18.3	302.2	0.39	0.031	0.156
6	T1	0.28	39.0	142.0	0.15	0.015	0.065
16	R2	0.28	39.0	141.8	0.15	0.014	0.062
		0.28	31.6	175.1	0.20	0.018	0.083
North: Dorsey Avenue							
7	L2	0.43	14.5	381.5	0.46	0.039	0.340
4	T1	0.43	12.0	460.3	0.57	0.049	0.351
14	R2	0.42	18.5	299.8	0.33	0.033	0.262
		0.43	14.1	391.6	0.47	0.042	0.322
West: Greenbag Road							
5	L2	0.33	25.1	220.0	0.25	0.024	0.095
2	T1	0.41	15.0	368.9	0.45	0.038	0.349
12	R2	0.41	12.3	448.0	0.55	0.048	0.360
		0.40	15.6	356.0	0.43	0.037	0.305
INTERSECTION:		0.36	18.6	298.3	0.36	0.031	0.242

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	242	639	0.378	10.9	0.73	1.7	43.1	1600.0
East: Greenbag Road								
1	636	972	0.654	13.7	0.88	8.3	209.5	1600.0
North: Dorsey Avenue								
1	549	678	0.811	28.0	1.38	10.8	270.8	1600.0
West: Greenbag Road								
1	164	884	0.186	5.9	0.48	0.8	19.0	460.0T
2	751	877	0.855	27.2	1.56	17.2	432.3	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	242	150	639	0.378	100
East: Greenbag Road					
1	636	150	972	0.654	100
North: Dorsey Avenue					
1	549	150	678	0.811	100
West: Greenbag Road					
1	164	150	884	0.186	100
2	751	150	877	0.855	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	242	3		0.378	10.9	43	1600
	242	3		0.378	10.9	43	
East: Greenbag Road							
1	636	1		0.654	13.7	210	1600
	636	1		0.654	13.7	210	
North: Dorsey Avenue							
1	549	1		0.811	28.0	271	1600
	549	1		0.811	28.0	271	
West: Greenbag Road							
1	164	0		0.186	5.9	19	460
2	751	1		0.855	27.2	432	1600
	915	1		0.855	23.4	432	
ALL VEHICLES							
	Total Flow	% HV		Max X	Aver. Delay	Max Queue	
	2342	1		0.855	20.6	432	

Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled

```
     intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout

-----------------------------------------------------
                                        Average  Driver
 Lane    Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       17.8   1420    2.54    66.28    25.60    1.56
-----------------------------------------------------
 East: Greenbag Road
 1       20.2   1380    2.61    77.10    25.15    1.76
-----------------------------------------------------
 North: Dorsey Avenue
 1       19.9   1380    2.61    76.11    25.17    1.75
-----------------------------------------------------
 West: Greenbag Road
 1      NA - Short Lane
 2       21.1   1420    2.54    78.54    25.16    1.72
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green           dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.378    NA      NA     5.6   7.5   3.4  10.9   4.7   7.8   1.1   6.6   0.0   10.9
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.654    NA      NA     3.7   7.0   6.7  13.7   5.4   9.5   3.2   6.3   0.0   13.7
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.811    NA      NA     5.3   9.4  18.7  28.0   4.9  23.4   7.8  15.6   0.0   28.0
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.186    NA      NA     4.1   5.0   0.9   5.9   4.6   3.5   0.0   3.5   0.0    5.9
 2      0.855    NA      NA     4.1   8.4  18.8  27.2   5.8  21.5  10.0  11.5   0.0   27.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)    Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green           No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.378    NA      NA     0.1    0.6   0.1    0.7    1.7  0.01   0.03    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.654    NA      NA     0.9    1.9   1.4    3.4    8.3  0.05   0.13    0.0    NA
-------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1    0.811    NA      NA     1.9    2.0   2.3    4.3   10.8  0.07   0.17    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Ratio Stor. Av.	95%	Prob. Block %	Prob. SL Ov. %
West: Greenbag Road												
1	0.186	NA	NA	0.0	0.3	0.0	0.3	0.8	0.02	0.04	NA	0.0
2	0.855	NA	NA	3.1	2.6	4.3	6.9	17.2	0.11	0.27	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Ratio Stor. Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.378	NA	NA	2.7	15.1	2.2	17.3	43.1	0.01	0.03	0.0	NA
East: Greenbag Road												
1	0.654	NA	NA	23.4	48.6	35.7	84.3	209.5	0.05	0.13	0.0	NA
North: Dorsey Avenue												
1	0.811	NA	NA	48.7	51.0	58.0	109.0	270.8	0.07	0.17	0.0	NA
West: Greenbag Road												
1	0.186	NA	NA	0.0	7.7	0.0	7.7	19.0	0.02	0.04	NA	0.0
2	0.855	NA	NA	78.0	66.2	107.8	174.0	432.3	0.11	0.27	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.378	NA	NA	0.1	0.7	1.3
East: Greenbag Road						
1	0.654	NA	NA	0.9	2.4	4.4
North: Dorsey Avenue						
1	0.811	NA	NA	1.9	4.3	7.8
West: Greenbag Road						
1	0.186	NA	NA	0.0	0.3	0.5
2	0.855	NA	NA	3.1	5.7	10.3

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.378	NA	NA	2.7	18.8	34.0
East: Greenbag Road						
1	0.654	NA	NA	23.4	60.8	110.3
North: Dorsey Avenue						
1	0.811	NA	NA	48.7	107.7	195.3
West: Greenbag Road						
1	0.186	NA	NA	0.0	6.7	12.2
2	0.855	NA	NA	78.0	142.7	258.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
1	0.378	0.7	0.9	1.2	1.4	1.7	1.9	2.0
East: Greenbag Road								
1	0.654	3.4	4.3	6.1	7.1	8.3	9.2	9.9
North: Dorsey Avenue								
1	0.811	4.3	5.6	7.9	9.1	10.8	11.9	12.8
West: Greenbag Road								
1	0.186	0.3	0.4	0.6	0.6	0.8	0.8	0.9
2	0.855	6.9	9.0	12.6	14.6	17.2	19.1	20.5

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
		Percentile Back of Queue (feet)						
South: Kingwood Pike								
1	0.378	17.3	22.4	31.6	36.6	43.1	47.8	51.4
East: Greenbag Road								
1	0.654	84.3	109.2	153.9	178.2	209.5	232.6	250.0
North: Dorsey Avenue								
1	0.811	108.9	141.1	198.9	230.3	270.8	300.5	323.1
West: Greenbag Road								
1	0.186	7.7	9.9	14.0	16.2	19.0	21.1	22.7
2	0.855	173.9	225.2	317.5	367.6	432.3	479.8	515.8

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.378	NA	NA	0.67	0.06	0.00	0.73	177.5	0.19	47.0	0.67	0.87
East: Greenbag Road												
1	0.654	NA	NA	0.69	0.19	0.00	0.88	561.9	0.44	281.7	0.77	1.22
North: Dorsey Avenue												
1	0.811	NA	NA	0.94	0.43	0.00	1.38	755.7	1.29	710.9	0.94	2.24
West: Greenbag Road												
1	0.186	NA	NA	0.48	0.00	0.00	0.48	79.3	0.00	0.0	0.53	0.53
2	0.855	NA	NA	1.00	0.56	0.00	1.56	1171.2	1.52	1137.2	1.00	2.51

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	78.7	87.6	75.3	241.6
%HV (all designations)	4.0	3.0	2.0	3.0
From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	470.8	33.7	636.0
%HV (all designations)	0.0	1.0	0.0	0.7
From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	149.4	238.2	161.8	549.4

%HV (all designations)	1.0	0.0	2.0	0.9

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	584.3	166.3	914.6
%HV (all designations)	0.0	1.0	0.0	0.6

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

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Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	75.5	85.0	73.8	234.3
Mov Class %	96.0	97.0	98.0	97.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	466.1	33.7	631.2
Mov Class %	100.0	99.0	100.0	99.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	147.9	238.2	158.6	544.7
Mov Class %	99.0	100.0	98.0	99.1
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	578.4	166.3	908.8
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	3.1	2.6	1.5	7.3
Mov Class %	4.0	3.0	2.0	3.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	4.7	0.0	4.7
Mov Class %	0.0	1.0	0.0	0.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	1.5	0.0	3.2	4.7
Mov Class %	1.0	0.0	2.0	0.9
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	5.8	0.0	5.8
Mov Class %	0.0	1.0	0.0	0.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

```
-----------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

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Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV               75.5    85.0    73.8   234.3
   HV                3.1     2.6     1.5     7.3
   Total            78.7    87.6    75.3   241.6
-------------------------------------------------
 Approach           78.7    87.6    75.3   241.6
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              131.5   466.1    33.7   631.2
   HV                  *     4.7       *     4.7
   Total           131.5   470.8    33.7   636.0
-------------------------------------------------
 Approach          131.5   470.8    33.7   636.0
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              147.9   238.2   158.6   544.7
   HV                1.5       *     3.2     4.7
   Total           149.4   238.2   161.8   549.4
-------------------------------------------------
 Approach          149.4   238.2   161.8   549.4
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              164.0       *       *   164.0
   Total           164.0       *       *   164.0
 Lane  2
   LV                  *   578.4   166.3   744.7
   HV                  *     5.8       *     5.8
   Total               *   584.3   166.3   750.6
-------------------------------------------------
 Approach          164.0   584.3   166.3   914.6
-------------------------------------------------
   *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
   *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
```

```
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

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Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

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Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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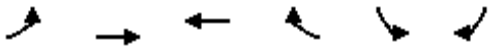
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Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\LOS & Q\2048 Build\2019-04-04 Revised Roundabouts\Greenbag & Dorsey\Greenbag & Dorsey Roundabout HCM 6 - With Luckey to Remain.sip8

ENCLOSURE

- 2048 No Build Conditions Capacity and Queue Analyses
- Greenbag Road (CR 857) and Mississippi Avenue Improvement Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane and Westbound Right Turn Lane
- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn and Right Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane

ENCLOSURE

- 2048 No Build Conditions Capacity and Queue Analyses



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962		0.933	
Flt Protected		0.985			0.975	
Satd. Flow (prot)	0	1596	1481	0	1426	0
Flt Permitted		0.985			0.975	
Satd. Flow (perm)	0	1596	1481	0	1426	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	548	901	0	330	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	154.5

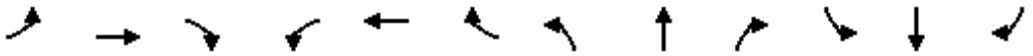
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	324	555	220	144	140
Future Vol, veh/h	147	324	555	220	144	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	2	4	10	18	11
Mvmt Flow	171	377	645	256	167	163

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	901	0	-	0	1492	773
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	4.15	-	-	-	6.98	6.51
Critical Hdwy Stg 1	-	-	-	-	5.98	-
Critical Hdwy Stg 2	-	-	-	-	5.98	-
Follow-up Hdwy	2.245	-	-	-	3.662	3.399
Pot Cap-1 Maneuver	742	-	-	-	~ 106	369
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	742	-	-	-	~ 75	369
Mov Cap-2 Maneuver	-	-	-	-	~ 75	-
Stage 1	-	-	-	-	279	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	$ 826.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	742	-	-	-	124
HCM Lane V/C Ratio	0.23	-	-	-	2.663
HCM Control Delay (s)	11.3	0	-	-	$ 826.4
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	29.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

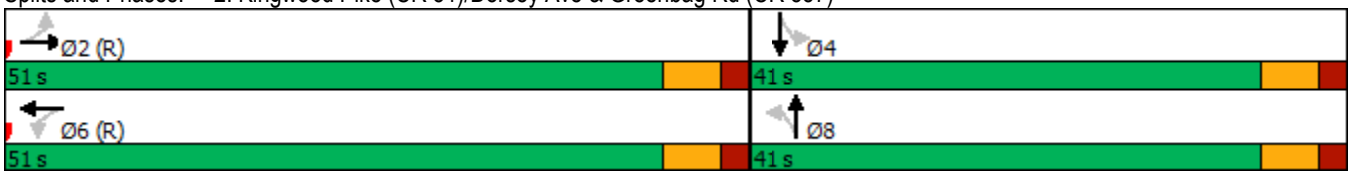


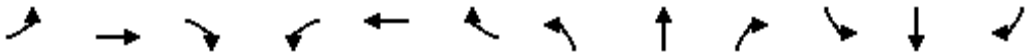
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.995			0.958			0.921	
Flt Protected		0.993			0.997			0.983			0.984	
Satd. Flow (prot)	0	1621	0	0	1726	0	0	1711	0	0	1457	0
Flt Permitted		0.841			0.950			0.755			0.666	
Satd. Flow (perm)	0	1373	0	0	1645	0	0	1314	0	0	986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			3			28			88	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	513	0	0	572	0	0	618	0	0	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		0.76			0.71			1.20			0.67	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		28.0			24.3			133.2			25.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		28.0			24.3			133.2			25.2	
LOS		C			C			F			C	
Approach Delay		28.0			24.3			133.2			25.2	
Approach LOS		C			C			F			C	
Queue Length 50th (ft)		231			248			~431			95	
Queue Length 95th (ft)		370			378			#643			196	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		674			806			517			429	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.76			0.71			1.20			0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 59.2		Intersection LOS: E	
Intersection Capacity Utilization 97.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

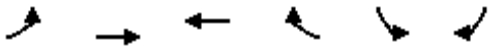




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1584	1584	1584	1874	1874	1874	2160	2160	2160	1611	1611	1611
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	1	1	1	0	0	0
Cap, veh/h	117	548	50	72	818	32	242	214	182	159	61	236
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	148	1121	101	61	1671	66	498	562	478	282	160	619
Grp Volume(v), veh/h	513	0	0	572	0	0	618	0	0	288	0	0
Grp Sat Flow(s),veh/h/ln	1370	0	0	1799	0	0	1539	0	0	1061	0	0
Q Serve(g_s), s	6.4	0.0	0.0	0.0	0.0	0.0	14.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	27.5	0.0	0.0	21.1	0.0	0.0	35.0	0.0	0.0	20.2	0.0	0.0
Prop In Lane	0.15		0.07	0.06		0.04	0.34		0.31	0.32		0.58
Lane Grp Cap(c), veh/h	715	0	0	921	0	0	638	0	0	455	0	0
V/C Ratio(X)	0.72	0.00	0.00	0.62	0.00	0.00	0.97	0.00	0.00	0.63	0.00	0.00
Avail Cap(c_a), veh/h	715	0	0	921	0	0	638	0	0	455	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.6	0.0	0.0	17.3	0.0	0.0	30.2	0.0	0.0	23.3	0.0	0.0
Incr Delay (d2), s/veh	6.1	0.0	0.0	3.1	0.0	0.0	28.8	0.0	0.0	6.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	0.0	8.8	0.0	0.0	17.9	0.0	0.0	5.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.7	0.0	0.0	20.5	0.0	0.0	59.0	0.0	0.0	29.9	0.0	0.0
LnGrp LOS	C	A	A	C	A	A	E	A	A	C	A	A
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		24.7			20.5			59.0			29.9	
Approach LOS		C			C			E			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.0		41.0		51.0		41.0				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		45.0		35.0		45.0		35.0				
Max Q Clear Time (g_c+I1), s		29.5		22.2		23.1		37.0				
Green Ext Time (p_c), s		3.0		1.5		3.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700
Lane Width (ft)	11	11	11	11	14	14
Grade (%)		-3%	2%		2%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965		0.915	
Flt Protected		0.989			0.982	
Satd. Flow (prot)	0	1633	1547	0	1603	0
Flt Permitted		0.989			0.982	
Satd. Flow (perm)	0	1633	1547	0	1603	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	923	730	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		14	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.18	1.18	1.22	1.22	1.08	1.08
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 112.4%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	30

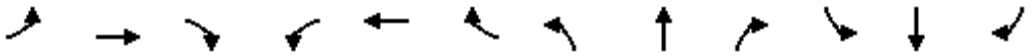
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	670	501	178	55	92
Future Vol, veh/h	189	670	501	178	55	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	-3	2	-	2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	0	0	1
Mvmt Flow	203	720	539	191	59	99

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	730	0	-	0	1761	635
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	1126	-
Critical Hdwy	4.11	-	-	-	6.8	6.41
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	879	-	-	-	77	464
Stage 1	-	-	-	-	496	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	~ 47	464
Mov Cap-2 Maneuver	-	-	-	-	~ 47	-
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	276	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	$ 330.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	879	-	-	-	107
HCM Lane V/C Ratio	0.231	-	-	-	1.477
HCM Control Delay (s)	10.3	0	-	-	$ 330.1
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.9	-	-	-	11.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

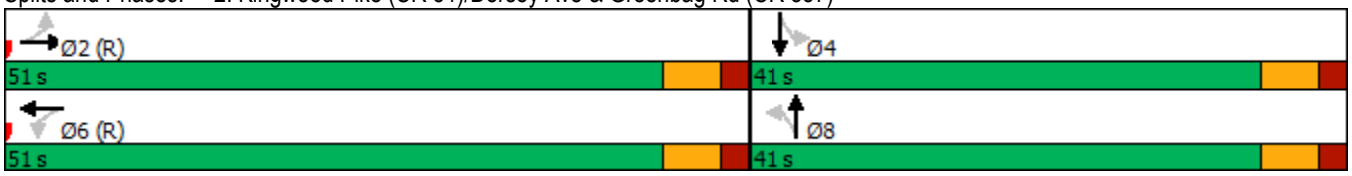


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	10	10	10	10
Grade (%)		6%			-2%			-7%			7%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.993			0.958			0.960	
Flt Protected		0.991			0.990			0.984			0.987	
Satd. Flow (prot)	0	1710	0	0	1810	0	0	1680	0	0	1608	0
Flt Permitted		0.737			0.630			0.674			0.817	
Satd. Flow (perm)	0	1272	0	0	1152	0	0	1150	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			28			26	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	914	0	0	636	0	0	242	0	0	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.05	1.05	1.05	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	51.0	51.0		51.0	51.0		41.0	41.0		41.0	41.0	
Total Split (%)	55.4%	55.4%		55.4%	55.4%		44.6%	44.6%		44.6%	44.6%	
Maximum Green (s)	45.0	45.0		45.0	45.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		45.0			45.0			35.0			35.0	
Actuated g/C Ratio		0.49			0.49			0.38			0.38	
v/c Ratio		1.45			1.13			0.53			1.05	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		235.4			102.6			24.6			82.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		235.4			102.6			24.6			82.4	
LOS		F			F			C			F	
Approach Delay		235.4			102.6			24.6			82.4	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)		~734			~433			95			~342	
Queue Length 95th (ft)		#954			#634			168			#535	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)												
Base Capacity (vph)		630			565			454			522	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		1.45			1.13			0.53			1.05	

Intersection Summary			
Area Type:	Other		
Cycle Length: 92			
Actuated Cycle Length: 92			
Offset: 51 (55%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 130			
Control Type: Pretimed			
Maximum v/c Ratio: 1.45			
Intersection Signal Delay: 141.6		Intersection LOS: F	
Intersection Capacity Utilization 100.9%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)



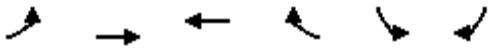
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1673	1673	1673	1964	1964	1964	2130	2130	2130	1611	1611	1611
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	0	0	0
Cap, veh/h	129	345	95	144	450	31	182	207	151	177	236	152
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	170	706	194	198	921	63	341	544	398	335	620	400
Grp Volume(v), veh/h	914	0	0	636	0	0	242	0	0	549	0	0
Grp Sat Flow(s),veh/h/ln	1071	0	0	1182	0	0	1284	0	0	1354	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0
Cycle Q Clear(g_c), s	45.0	0.0	0.0	45.0	0.0	0.0	11.0	0.0	0.0	35.0	0.0	0.0
Prop In Lane	0.18		0.18	0.21		0.05	0.33		0.31	0.27		0.30
Lane Grp Cap(c), veh/h	570	0	0	625	0	0	540	0	0	565	0	0
V/C Ratio(X)	1.60	0.00	0.00	1.02	0.00	0.00	0.45	0.00	0.00	0.97	0.00	0.00
Avail Cap(c_a), veh/h	570	0	0	625	0	0	540	0	0	565	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	24.5	0.0	0.0	23.7	0.0	0.0	20.5	0.0	0.0	29.5	0.0	0.0
Incr Delay (d2), s/veh	279.8	0.0	0.0	40.4	0.0	0.0	2.7	0.0	0.0	31.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	56.0	0.0	0.0	19.7	0.0	0.0	3.9	0.0	0.0	16.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	304.3	0.0	0.0	64.1	0.0	0.0	23.2	0.0	0.0	61.0	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	C	A	A	E	A	A
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		304.3			64.1			23.2			61.0	
Approach LOS		F			E			C			E	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	51.0	41.0	51.0	41.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	45.0	35.0	45.0	35.0
Max Q Clear Time (g_c+I1), s	47.0	37.0	47.0	13.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4

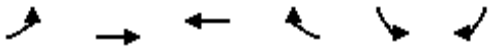
Intersection Summary	
HCM 6th Ctrl Delay	152.9
HCM 6th LOS	F

ENCLOSURE

- Greenbag Road (CR 857) and Mississippi Avenue Improvement Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane and Westbound Right Turn Lane



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	147	324	555	220	144	140
Future Volume (vph)	147	324	555	220	144	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	1828	1748	1405	1464	1392
Flt Permitted	0.182				0.950	
Satd. Flow (perm)	323	1828	1748	1405	1464	1392
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				256		163
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	5%	2%	4%	10%	18%	11%
Adj. Flow (vph)	171	377	645	256	167	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	377	645	256	167	163
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

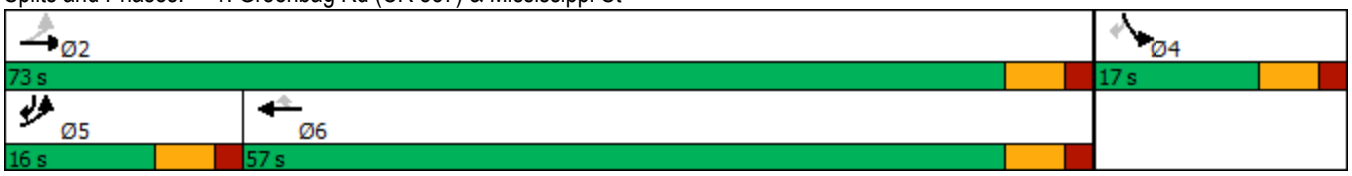


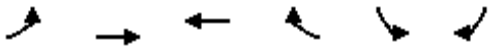
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	24.0	16.0	16.0
Total Split (s)	16.0	73.0	57.0	57.0	17.0	16.0
Total Split (%)	17.8%	81.1%	63.3%	63.3%	18.9%	17.8%
Maximum Green (s)	10.0	67.0	51.0	51.0	11.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	Min	None
Act Effct Green (s)	47.7	47.7	32.1	32.1	11.3	26.9
Actuated g/C Ratio	0.67	0.67	0.45	0.45	0.16	0.38
v/c Ratio	0.43	0.31	0.82	0.33	0.72	0.26
Control Delay	7.3	5.3	26.1	2.6	52.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	5.3	26.1	2.6	52.4	5.1
LOS	A	A	C	A	D	A
Approach Delay		5.9	19.4		29.1	
Approach LOS		A	B		C	
Queue Length 50th (ft)	23	56	235	0	70	0
Queue Length 95th (ft)	37	81	325	27	#200	38
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	412	1671	1281	1098	231	639
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.23	0.50	0.23	0.72	0.26

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 71.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 17.1		Intersection LOS: B	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St

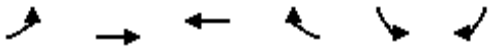




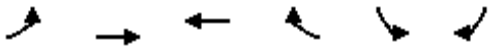
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	324	555	220	144	140
Future Volume (veh/h)	147	324	555	220	144	140
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1943	1988	1817	1728	1610	1713
Adj Flow Rate, veh/h	171	377	645	256	167	163
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	2	4	10	18	11
Cap, veh/h	374	1264	805	649	225	335
Arrive On Green	0.08	0.64	0.44	0.44	0.15	0.15
Sat Flow, veh/h	1850	1988	1817	1465	1533	1452
Grp Volume(v), veh/h	171	377	645	256	167	163
Grp Sat Flow(s),veh/h/ln	1850	1988	1817	1465	1533	1452
Q Serve(g_s), s	2.5	4.7	16.9	6.5	5.8	5.4
Cycle Q Clear(g_c), s	2.5	4.7	16.9	6.5	5.8	5.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	374	1264	805	649	225	335
V/C Ratio(X)	0.46	0.30	0.80	0.39	0.74	0.49
Avail Cap(c_a), veh/h	553	2411	1677	1352	305	411
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	4.5	13.3	10.4	22.6	18.4
Incr Delay (d2), s/veh	0.9	0.1	1.9	0.4	6.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.1	5.6	1.7	2.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.1	4.7	15.2	10.8	28.8	19.5
LnGrp LOS	B	A	B	B	C	B
Approach Vol, veh/h		548	901		330	
Approach Delay, s/veh		6.7	13.9		24.2	
Approach LOS		A	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		41.1		14.1	10.6	30.5
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		67.0		11.0	10.0	51.0
Max Q Clear Time (g_c+I1), s		6.7		7.8	4.5	18.9
Green Ext Time (p_c), s		2.3		0.4	0.2	5.6

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B



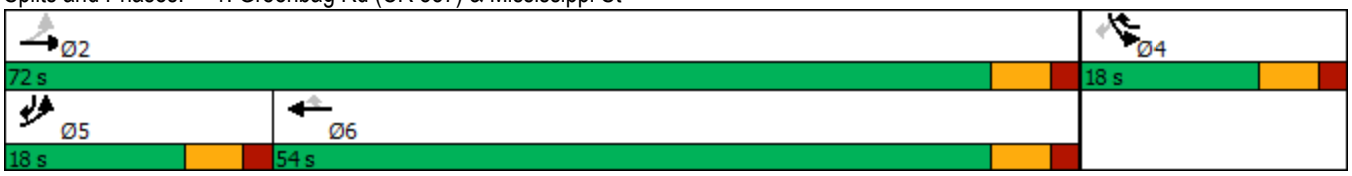
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	189	670	501	178	55	92
Future Volume (vph)	189	670	501	178	55	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)		-3%	2%		2%	
Storage Length (ft)	100			0	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	75				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1753	1846	1783	1546	1727	1530
Flt Permitted	0.220				0.950	
Satd. Flow (perm)	406	1846	1783	1546	1727	1530
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				191		99
Link Speed (mph)		40	40		25	
Link Distance (ft)		1361	1654		743	
Travel Time (s)		23.2	28.2		20.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	0%	0%	1%
Adj. Flow (vph)	203	720	539	191	59	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	720	539	191	59	99
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.02	1.02	1.06	1.06	1.06	1.06
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

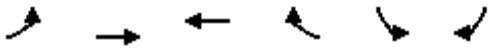


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Detector Phase	5	2	6	4	4	5
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	24.0	16.0	16.0	16.0
Total Split (s)	18.0	72.0	54.0	18.0	18.0	18.0
Total Split (%)	20.0%	80.0%	60.0%	20.0%	20.0%	20.0%
Maximum Green (s)	12.0	66.0	48.0	12.0	12.0	12.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	39.4	39.4	23.0	36.9	7.6	24.1
Actuated g/C Ratio	0.66	0.66	0.39	0.62	0.13	0.41
v/c Ratio	0.41	0.59	0.78	0.19	0.27	0.15
Control Delay	6.3	7.8	25.0	1.2	30.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.8	25.0	1.2	30.1	4.4
LOS	A	A	C	A	C	A
Approach Delay		7.4	18.8		14.0	
Approach LOS		A	B		B	
Queue Length 50th (ft)	21	110	160	0	19	0
Queue Length 95th (ft)	47	213	291	16	60	29
Internal Link Dist (ft)		1281	1574		663	
Turn Bay Length (ft)	100				225	
Base Capacity (vph)	550	1791	1463	1140	361	732
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.40	0.37	0.17	0.16	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 59.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Greenbag Rd (CR 857) & Mississippi St





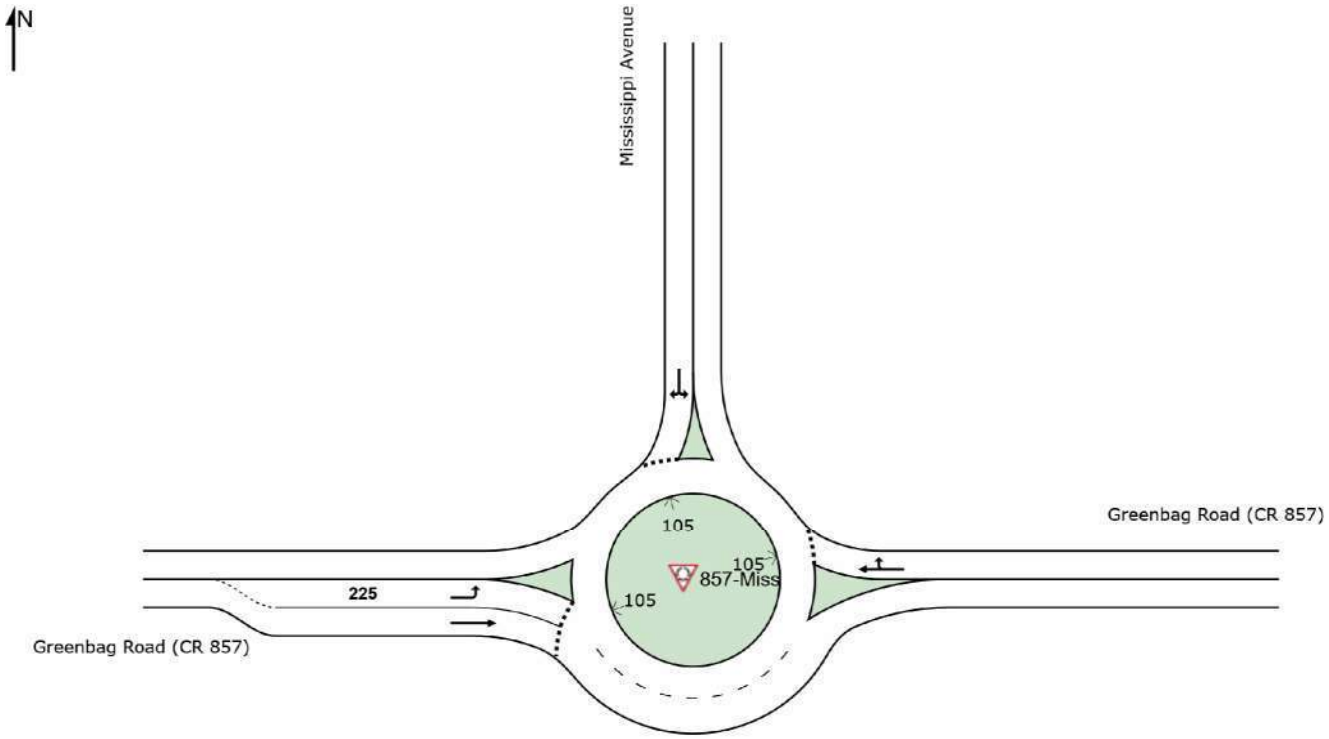
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	189	670	501	178	55	92
Future Volume (veh/h)	189	670	501	178	55	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	2003	2003	1847	1876	1876	1862
Adj Flow Rate, veh/h	203	720	539	191	59	99
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	2	0	0	1
Cap, veh/h	461	1250	720	795	198	335
Arrive On Green	0.10	0.62	0.39	0.39	0.11	0.11
Sat Flow, veh/h	1908	2003	1847	1590	1787	1578
Grp Volume(v), veh/h	203	720	539	191	59	99
Grp Sat Flow(s),veh/h/ln	1908	2003	1847	1590	1787	1578
Q Serve(g_s), s	2.5	9.5	11.4	3.1	1.4	2.4
Cycle Q Clear(g_c), s	2.5	9.5	11.4	3.1	1.4	2.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	461	1250	720	795	198	335
V/C Ratio(X)	0.44	0.58	0.75	0.24	0.30	0.30
Avail Cap(c_a), veh/h	773	2922	1959	1863	474	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	5.0	11.9	6.4	18.5	15.0
Incr Delay (d2), s/veh	0.7	0.4	1.6	0.2	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.7	3.6	1.0	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.8	5.4	13.5	6.6	19.3	15.5
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h		923	730		158	
Approach Delay, s/veh		6.2	11.7		16.9	
Approach LOS		A	B		B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.2		11.0	10.6	23.6
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		66.0		12.0	12.0	48.0
Max Q Clear Time (g_c+I1), s		11.5		4.4	4.5	13.4
Green Ext Time (p_c), s		5.6		0.3	0.3	4.3
Intersection Summary						
HCM 6th Ctrl Delay			9.3			
HCM 6th LOS			A			

SITE LAYOUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout



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Organisation: STAHL SHAEFFER ENGINEERING LLC | Created: Wednesday, April 03, 2019 11:05:08 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	645	4.0	0.829	21.0	LOS C	23.6	617.8	0.87	1.01	1.54	28.5
16	R2	256	10.0	0.829	21.2	LOS C	23.6	617.8	0.87	1.01	1.54	27.7
Approach		901	5.7	0.829	21.1	LOS C	23.6	617.8	0.87	1.01	1.54	28.2
North: Mississippi Avenue												
7	L2	167	18.0	0.544	15.7	LOS B	3.4	94.5	0.74	0.98	1.22	22.0
14	R2	163	11.0	0.544	15.3	LOS B	3.4	94.5	0.74	0.98	1.22	21.1
Approach		330	14.5	0.544	15.5	LOS B	3.4	94.5	0.74	0.98	1.22	21.6
West: Greenbag Road (CR 857)												
5	L2	171	5.0	0.151	4.5	LOS A	0.6	16.1	0.33	0.21	0.33	33.0
2	T1	377	2.0	0.324	6.2	LOS A	1.6	41.4	0.40	0.27	0.40	34.6
Approach		548	2.9	0.324	5.7	LOS A	1.6	41.4	0.37	0.25	0.37	34.1
All Vehicles		1779	6.5	0.829	15.3	LOS B	23.6	617.8	0.69	0.77	1.12	28.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE LEVEL OF SERVICE

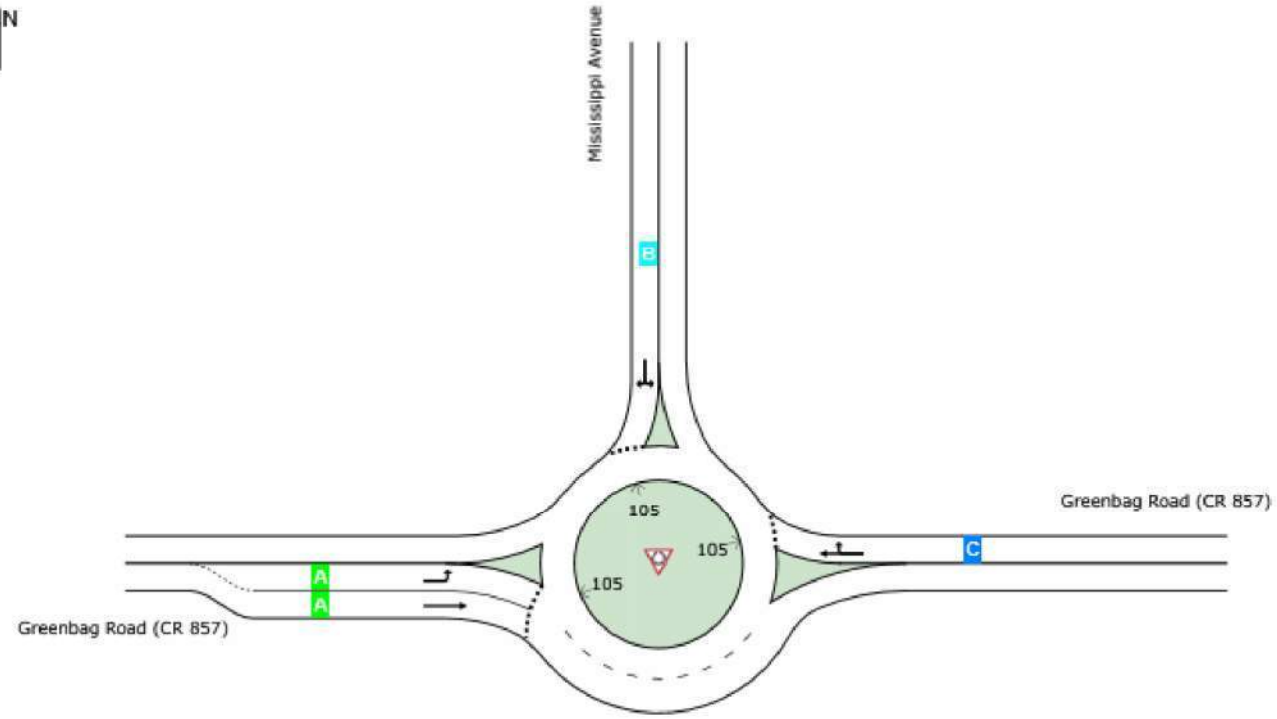
Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	C	B	A	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

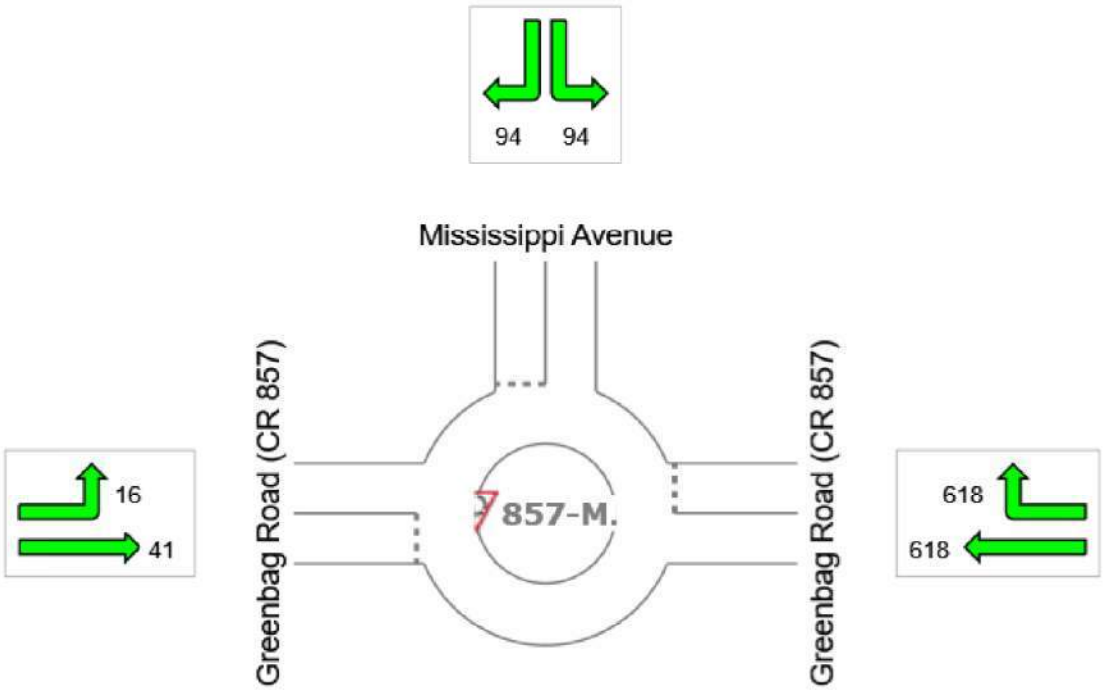
Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	618	94	41	618



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane

Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

```
  N   L2   1 Subdominant    167  1.18   198    0.0    0.0    N       -      16.0    0.00    0.000
  E   T1   2 Dominant       167  1.18   198    0.0    0.0    N       -      16.0    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
            No.  Type      In-Bunch  Prop.  Priority  HVE for  -------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                               sec       ft     sec
-------------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    T1    1 Dominant       0.00    0.000      N       1.04     4.98   120.2     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.10     4.98   120.2     2.61
-------------------------------------------------------------------------------------------------
North: Mississippi Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.18     4.98   187.6     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.11     4.98   187.6     2.61
-------------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.05     4.54   106.9     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.02     4.54   106.9     2.54
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane          Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
----------------------------------------
  East: Greenbag Road (CR 857)
  1             171     179    100.0%
  Total         171     179
----------------------------------------
  North: Mississippi Avenue
  1             645     671    100.0%
  Total         645     671
----------------------------------------
  West: Greenbag Road (CR 857)
  1             167     198    100.0%
  Total         167     198
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

--------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
--------------------------------------
  East: Greenbag Road (CR 857)
  1           256      645      901
  Total       256      645      901
--------------------------------------
  North: Mississippi Avenue
  1           163      167      330
  Total       163      167      330
--------------------------------------
  West: Greenbag Road (CR 857)
  1             0      171      171
  2           377        0      377
  Total       377      171      548
--------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	32.6	28.5	3336.9#	79.9#	407.9	407.9	14.3
	North	R2	31.6	27.7	3336.9#	82.1#	161.7	161.7	5.8
North: Mississippi Avenue									
	East	L2	24.3	22.0	3351.9#	103.8#	106.3	106.3	4.8
	West	R2	23.2	21.1	3351.9#	108.3#	103.3	103.3	4.9
West: Greenbag Road (CR 857)									
	North	L2	34.4	33.0	3464.3#	71.5#	112.1	112.1	3.4
	East	T1	36.6	34.6	3365.6#	66.4#	240.1	240.1	6.9
ALL VEHICLES:			31.8	28.1	3358.0#	81.4#	1131.5	1131.5	40.2

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	218.2	25.7	162.1	1600	488	NA
	North	R2	153.6	22.5	69.1	1600	488	NA
North: Mississippi Avenue								
	East	L2	62.8	16.0	246.6	1600	488	NA
	West	R2	131.9	21.2	62.2	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	67.3	16.5	264.3	1600	488	NA
	East	T1	175.9	23.7	165.6	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	App. Speeds Negn mph	Exit Speeds Negn Cruise mph	Exit Speeds mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	25.7	25.7	40.0	31.3	0.0
16	R2	40.0	22.5	22.5	40.0	31.3	0.0
North: Mississippi Avenue							
7	L2	25.0	16.0	16.0	25.0	18.1	0.0
14	R2	25.0	21.2	21.2	25.0	18.1	0.0
West: Greenbag Road (CR 857)							
5	L2	40.0	16.5	16.5	40.0	26.5	0.0
2	T1	40.0	23.7	23.7	40.0	29.9	0.0

HCM Delay Formula option used: Geometric Delay is not included in Control Delay.

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn	Mov Cl.	Arv Flow veh/h	Opng Flow veh/h	Movement Adjust. Flow pcu/h	Total Cap. veh/h	Prac. Deg. Satn xp	Prac. Spare Cap. %	Deg. Satn x
East: Greenbag Road (CR 857)									
6	T1	#	645	171	179	779	0.85	3	0.829*
16	R2	#	256	171	179	309	0.85	3	0.829*
North: Mississippi Avenue									
7	L2	#	167	645	671	308	0.85	56	0.544
14	R2	#	163	645	671	299	0.85	56	0.544
West: Greenbag Road (CR 857)									
5	L2	#	171	167	198	1130	0.85	462	0.151
2	T1	#	377	167	198	1163	0.85	162	0.324

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	3.77	4.52	21.0	1.01	650.1	36.60	407.9	14.3	28.5
16	R2	1.51	1.81	21.2	1.01	257.7	26.00	161.7	5.8	27.7
North: Mississippi Avenue										
7	L2	0.73	0.87	15.7	0.98	164.7	8.62	106.3	4.8	22.0
14	R2	0.69	0.83	15.3	0.98	160.1	8.44	103.3	4.9	21.1
West: Greenbag Road (CR 857)										
5	L2	0.21	0.26	4.5	0.21	35.5	3.71	112.1	3.4	33.0
2	T1	0.65	0.78	6.2	0.27	101.1	8.53	240.1	6.9	34.6

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	245.18	28.2	254.3	0.28	0.023	0.673
16	R2	95.95	8.6	77.6	0.09	0.007	0.199
		341.13	36.8	331.8	0.36	0.030	0.872
North: Mississippi Avenue							
7	L2	72.14	6.3	57.8	0.05	0.005	0.222
14	R2	71.12	8.2	75.3	0.06	0.006	0.315
		143.26	14.5	133.1	0.11	0.011	0.537
West: Greenbag Road (CR 857)							
5	L2	51.68	3.5	31.5	0.04	0.003	0.050
2	T1	88.65	5.9	52.9	0.07	0.005	0.044
		140.33	9.4	84.4	0.11	0.008	0.095
INTERSECTION:		624.72	60.8	549.3	0.58	0.049	1.503

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.37	14.5	387.4	0.42	0.034	1.025
16	R2	0.37	18.8	298.1	0.33	0.027	0.764
		0.37	15.5	362.0	0.40	0.032	0.951
North: Mississippi Avenue							
7	L2	0.42	16.8	337.7	0.29	0.031	1.299
14	R2	0.43	12.6	452.8	0.34	0.034	1.893
		0.42	14.4	394.5	0.31	0.033	1.592
West: Greenbag Road (CR 857)							

	5	L2	0.29	32.0	174.6	0.22	0.017	0.280
	2	T1	0.23	40.6	136.8	0.19	0.013	0.114
			0.25	37.4	148.8	0.20	0.014	0.167
INTERSECTION:			0.34	18.6	301.6	0.32	0.027	0.826

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
East: Greenbag Road (CR 857)								
1	901	1087	0.829	21.1	1.01	23.6	617.8	1600.0
North: Mississippi Avenue								
1	330	608	0.544	15.5	0.98	3.4	94.5	1600.0
West: Greenbag Road (CR 857)								
1	171	1130	0.151	4.5	0.21	0.6	16.1	225.0T
2	377	1163	0.324	6.2	0.27	1.6	41.4	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
East: Greenbag Road (CR 857)					
1	901	150	1087	0.829	100
North: Mississippi Avenue					
1	330	150	608	0.544	100
West: Greenbag Road (CR 857)					
1	171	150	1130	0.151	100
2	377	150	1163	0.324	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
East: Greenbag Road (CR 857)							
1	901	6		0.829	21.1	618	1600
	901	6		0.829	21.1	618	
North: Mississippi Avenue							
1	330	15		0.544	15.5	94	1600
	330	15		0.544	15.5	94	
West: Greenbag Road (CR 857)							
1	171	5		0.151	4.5	16	225
2	377	2		0.324	6.2	41	1600
	548	3		0.324	5.7	41	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
1779	6	0.829	15.3	618

Peak flow period = 15 minutes.

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------
                                      Average  Driver
 Lane   Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing  Space    Time
         mph    veh/h   sec      ft      ft      sec
-----------------------------------------------------
 East: Greenbag Road (CR 857)
 1       24.8   1380    2.61    94.89   26.14    1.89
-----------------------------------------------------
 North: Mississippi Avenue
 1       18.6   1380    2.61    71.20   27.91    1.59
-----------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7   1420    2.54    88.12   25.40    1.80
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                          ------------------  Delay (seconds/veh)  -------------------
        Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane   Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.      x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.829    NA      NA     3.3   7.5  13.6  21.1   6.3  15.6   5.5  10.1   0.0   21.1
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.544    NA      NA     5.9   8.6   6.8  15.5   4.3  12.3   2.7   9.7   0.0   15.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.151    NA      NA     3.2   3.9   0.6   4.5   5.0   2.9   0.0   2.9   0.0    4.5
 2      0.324    NA      NA     3.1   4.7   1.5   6.2   6.5   3.6   0.0   3.6   0.0    6.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1    0.829    NA      NA     3.0    3.7   5.8    9.5   23.6  0.16   0.39    0.0    NA
-------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1    0.544    NA      NA     0.4    0.9   0.4    1.4    3.4  0.02   0.06    0.0    NA
-------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1    0.151    NA      NA     0.0    0.2   0.0    0.2    0.6  0.03   0.07    NA     0.0
 2    0.324    NA      NA     0.0    0.7   0.0    0.7    1.6  0.01   0.03    0.0    NA
-------------------------------------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
```

HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.829	NA	NA	79.2	97.1	151.4	248.6	617.8	0.16	0.39	0.0	NA
North: Mississippi Avenue												
1	0.544	NA	NA	11.6	26.5	11.5	38.0	94.5	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	6.5	0.0	6.5	16.1	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	16.7	0.0	16.7	41.4	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.829	NA	NA	3.0	5.3	9.6
North: Mississippi Avenue						
1	0.544	NA	NA	0.4	1.4	2.6
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	0.2	0.4
2	0.324	NA	NA	0.0	0.6	1.2

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.829	NA	NA	79.2	138.0	250.3
North: Mississippi Avenue						
1	0.544	NA	NA	11.6	39.6	71.9
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	5.6	10.1
2	0.324	NA	NA	0.0	16.5	29.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.829	9.5	12.3	17.4	20.1	23.6	26.2	28.2
North: Mississippi Avenue								
1	0.544	1.4	1.8	2.5	2.9	3.4	3.8	4.0
West: Greenbag Road (CR 857)								
1	0.151	0.2	0.3	0.5	0.5	0.6	0.7	0.7
2	0.324	0.7	0.8	1.2	1.4	1.6	1.8	1.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.829	248.4	321.8	453.7	525.3	617.8	685.7	737.1
North: Mississippi Avenue								
1	0.544	38.0	49.2	69.4	80.3	94.5	104.9	112.7
West: Greenbag Road (CR 857)								
1	0.151	6.5	8.4	11.8	13.7	16.1	17.8	19.2
2	0.324	16.7	21.6	30.4	35.2	41.4	46.0	49.4

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.829	NA	NA	0.63	0.37	0.00	1.01	907.7	0.67	601.2	0.87	1.54
North: Mississippi Avenue												
1	0.544	NA	NA	0.74	0.24	0.00	0.98	324.8	0.48	157.1	0.74	1.22
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.21	0.00	0.00	0.21	35.5	0.00	0.0	0.33	0.33
2	0.324	NA	NA	0.27	0.00	0.00	0.27	101.1	0.00	0.0	0.40	0.40

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	645.3	255.8	901.2
%HV (all designations)	4.0	10.0	5.7
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	167.4	162.8	330.2
%HV (all designations)	18.0	11.0	14.5
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	170.9	376.7	547.7
%HV (all designations)	5.0	2.0	2.9

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT

Flow Rate	619.5	230.2	849.8
Mov Class %	96.0	90.0	94.3
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	137.3	144.9	282.2
Mov Class %	82.0	89.0	85.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	162.4	369.2	531.6
Mov Class %	95.0	98.0	97.1
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	25.8	25.6	51.4
Mov Class %	4.0	10.0	5.7
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	30.1	17.9	48.0
Mov Class %	18.0	11.0	14.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	8.5	7.5	16.1
Mov Class %	5.0	2.0	2.9
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.86	0.86	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - AM Peak

Site ID: 857-Miss
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	619.5	230.2	849.8
HV	25.8	25.6	51.4
Total	645.3	255.8	901.2
Approach	645.3	255.8	901.2

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	137.3	144.9	282.2
HV	30.1	17.9	48.0
Total	167.4	162.8	330.2
Approach	167.4	162.8	330.2

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	162.4	*	162.4
HV	8.5	*	8.5

```
   Total           170.9       *   170.9
 Lane  2
   LV                *   369.2   369.2
   HV                *     7.5     7.5
   Total             *   376.7   376.7
-----------------------------------------
 Approach          170.9   376.7   547.7
-----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
-----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           506.5    37.7   544.2
Total              506.5    37.7   544.2
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6    34.1   426.7
Total              392.6    34.1   426.7
-----------------------------------------
 Exit: WEST
Lane:  1           764.4    43.7   808.1
Total              764.4    43.7   808.1
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - AM Peak

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:06:28 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	539	2.0	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.8
16	R2	191	0.0	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.0
Approach		730	1.5	0.662	12.7	LOS B	8.2	207.6	0.69	0.61	0.86	31.6
North: Mississippi Avenue												
7	L2	59	0.0	0.202	6.7	LOS A	0.9	21.9	0.59	0.55	0.59	24.2
14	R2	99	1.0	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.0
Approach		158	0.6	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.4
West: Greenbag Road (CR 857)												
5	L2	203	1.0	0.153	4.0	LOS A	0.7	17.0	0.17	0.07	0.17	33.4
2	T1	720	1.0	0.541	8.5	LOS A	4.2	104.9	0.30	0.13	0.30	33.4
Approach		924	1.0	0.541	7.5	LOS A	4.2	104.9	0.27	0.12	0.27	33.4
All Vehicles		1812	1.2	0.662	9.6	LOS A	8.2	207.6	0.47	0.35	0.54	31.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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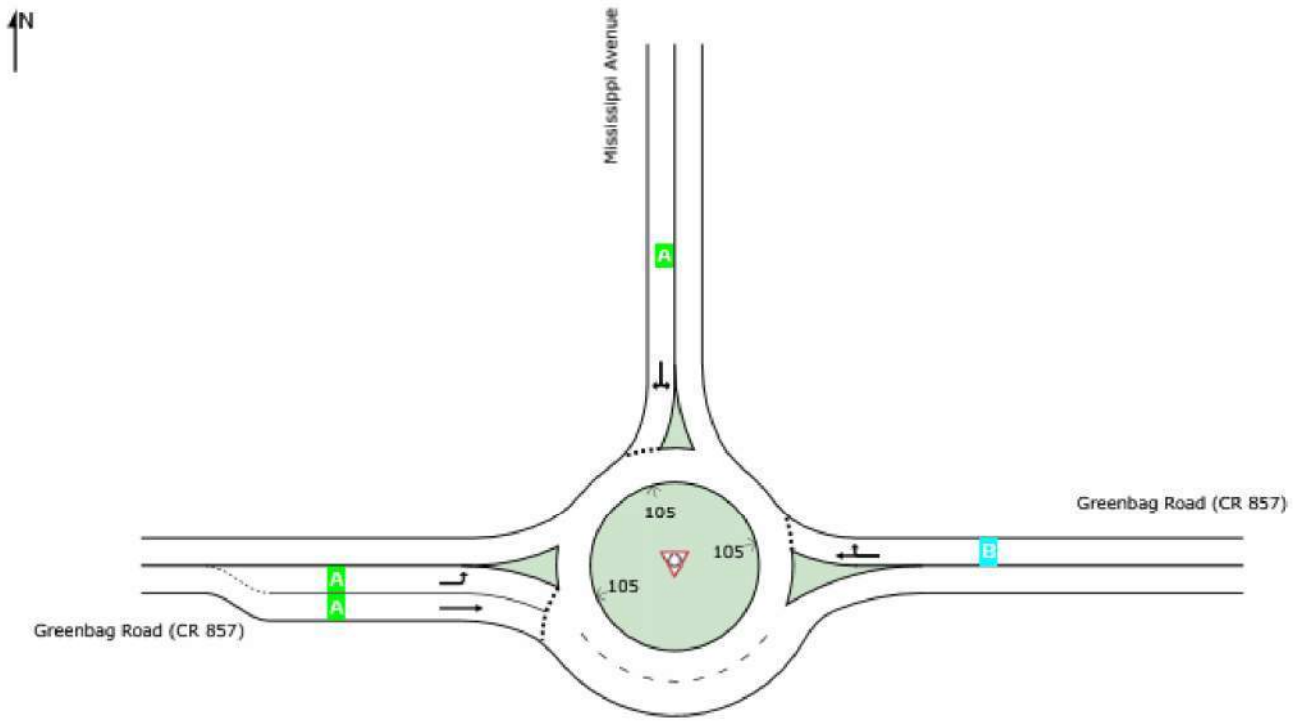
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	B	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

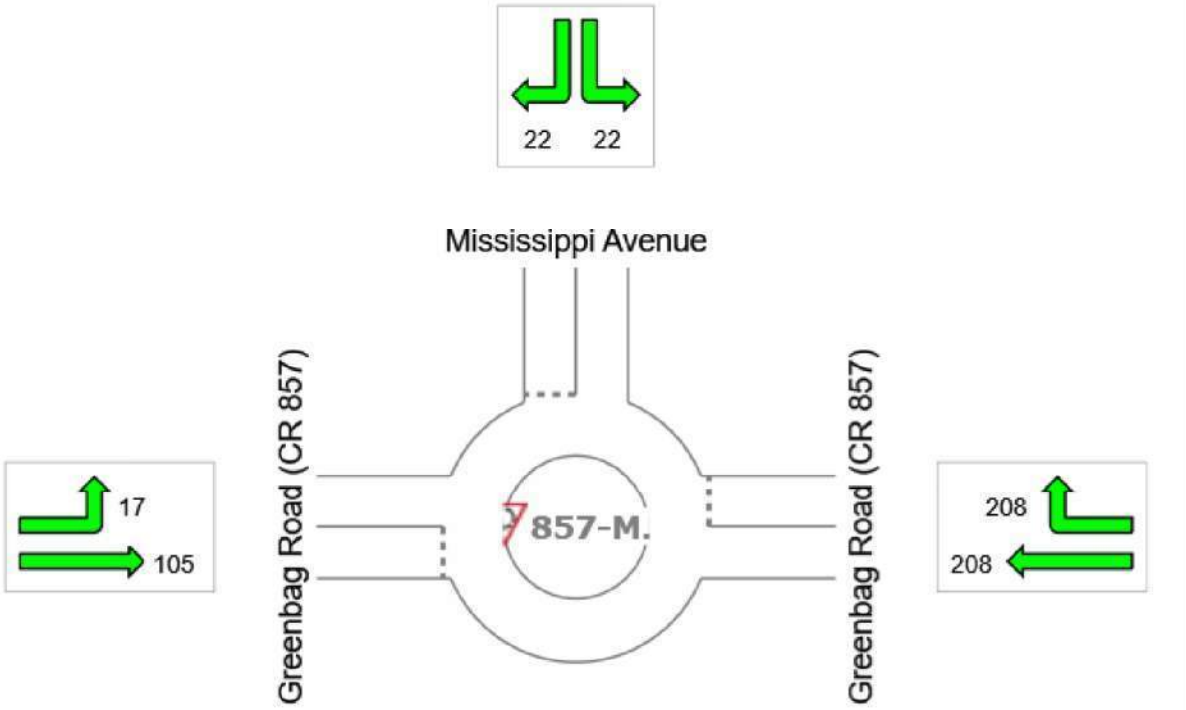
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	208	22	105	208



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - PM Peak]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
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- Origin-Destination Flow Rates (Total)
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Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													
N	L2	1	Subdominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000

```
  E   T1   2 Dominant        59  1.00    59    0.0    0.0    N       -      16.0    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                              Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for  -------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                          sec       ft     sec
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    T1    1 Dominant       0.00    0.000      N       1.02     4.98   120.2     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.00     4.98   120.2     2.61
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.00     4.98   187.6     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.01     4.98   187.6     2.61
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.01     4.54   106.9     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.01     4.54   106.9     2.54
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane         Circulating Flow Rate
  No.         veh/h   pcu/h   Percent
----------------------------------------
  East: Greenbag Road (CR 857)
  1             203     205    100.0%
  Total         203     205
----------------------------------------
  North: Mississippi Avenue
  1             539     549    100.0%
  Total         539     549
----------------------------------------
  West: Greenbag Road (CR 857)
  1              59      59    100.0%
  Total          59      59
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

----------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
----------------------------------------
  East: Greenbag Road (CR 857)
  1           191      539      730
  Total       191      539      730
----------------------------------------
  North: Mississippi Avenue
  1            99       59      158
  Total        99       59      158
----------------------------------------
  West: Greenbag Road (CR 857)
  1             0      203      203
  2           720        0      720
  Total       720      203      923
----------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

From Approach	To Exit	Turn	Running Speed mph	Travel Speed mph	Travel Distance ft	Travel Time s	Total Travel Distance Dem Flows veh-mi/h	Arv Flows veh-mi/h	Tot.Trav. Time veh-h/h
East: Greenbag Road (CR 857)									
	West	T1	35.3	31.8	3337.4#	71.5#	340.5	340.5	10.7
	North	R2	34.2	31.0	3337.4#	73.4#	121.0	121.0	3.9
North: Mississippi Avenue									
	East	L2	25.3	24.2	3331.6#	94.0#	37.3	37.3	1.5
	West	R2	24.1	23.0	3331.6#	98.6#	62.4	62.4	2.7
West: Greenbag Road (CR 857)									
	North	L2	34.9	33.4	3464.3#	70.8#	133.3	133.3	4.0
	East	T1	36.9	33.4	3365.6#	68.7#	459.2	459.2	13.8
ALL VEHICLES:			34.8	31.5	3362.3#	72.7#	1153.8	1153.8	36.6

"Running Speed" is the average speed excluding stopped periods.

Travel Time values include cruise times and intersection delays including acceleration, deceleration and idling delays.

Travel Distance and Travel Time values include travel on the External Exit section based on the Exit Distance or user-specified Downstream Distance value as applicable.

INTERSECTION NEGOTIATION DATA

From Approach	To Exit	Turn	Negn Radius ft	Negn Speed mph	Negn Dist ft	App Dist ft	Exit Dist ft	Downstr Dist ft
East: Greenbag Road (CR 857)								
	West	T1	218.2	25.7	162.1	1600	488	NA
	North	R2	153.6	22.5	69.1	1600	488	NA
North: Mississippi Avenue								
	East	L2	62.8	16.0	246.6	1600	488	NA
	West	R2	131.9	21.2	62.2	1600	488	NA
West: Greenbag Road (CR 857)								
	North	L2	67.3	16.5	264.3	1600	488	NA
	East	T1	175.9	23.7	165.6	1600	488	NA

Maximum Negotiation (Design) Speed = 30.0 mph

NA Downstream Distance does not apply if:
- Exit is an internal leg of a network
- "Program" option was specified
- Distance specified was less than the Exit Negotiation Distance
- Distance specified was greater than the exit leg length

MOVEMENT SPEEDS AND GEOMETRIC DELAY

Mov ID	Turn	App. Speeds Cruise mph	App. Speeds Negn mph	Exit Speeds Negn Cruise mph	Exit Speeds mph	Queue Move-up Speed mph	Geom Delay sec
East: Greenbag Road (CR 857)							
6	T1	40.0	25.7	25.7	40.0	29.0	0.0
16	R2	40.0	22.5	22.5	40.0	29.0	0.0
North: Mississippi Avenue							
7	L2	25.0	16.0	16.0	25.0	18.6	0.0
14	R2	25.0	21.2	21.2	25.0	18.6	0.0
West: Greenbag Road (CR 857)							
5	L2	40.0	16.5	16.5	40.0	26.5	0.0
2	T1	40.0	23.7	23.7	40.0	38.1	0.0

HCM Delay Formula option used: Geometric Delay is not included in Control Delay.

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Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

MOVEMENT CAPACITY PARAMETERS

Mov ID	Turn	Mov Cl.	Arv Flow veh/h	Opng Flow veh/h	Movement Adjust. Flow pcu/h	Total Cap. veh/h	Prac. Deg. Satn xp	Prac. Spare Cap. %	Deg. Satn x
East: Greenbag Road (CR 857)									
6	T1	#	539	203	205	814	0.85	28	0.662*
16	R2	#	191	203	205	289	0.85	28	0.662*
North: Mississippi Avenue									
7	L2	#	59	539	549	293	0.85	321	0.202
14	R2	#	99	539	549	490	0.85	321	0.202
West: Greenbag Road (CR 857)									
5	L2	#	203	59	59	1332	0.85	457	0.153
2	T1	#	720	59	59	1332	0.85	57	0.541

* Maximum degree of saturation
\# Combined Movement Capacity parameters are shown for all Movement Classes.

MOVEMENT PERFORMANCE

Mov ID	Turn	Total Delay (veh-h/h)	Total Delay (pers-h/h)	Aver. Delay (sec)	Eff. Stop Rate	Total Stops	Perf. Index	Tot.Trav. Distance (veh-mi/h)	Tot.Trav. Time (veh-h/h)	Aver. Speed (mph)
East: Greenbag Road (CR 857)										
6	T1	1.91	2.29	12.7	0.61	327.1	18.84	340.5	10.7	31.8
16	R2	0.67	0.81	12.7	0.61	116.2	7.65	121.0	3.9	31.0
North: Mississippi Avenue										
7	L2	0.11	0.13	6.7	0.55	32.8	2.14	37.3	1.5	24.2
14	R2	0.19	0.22	6.8	0.55	54.8	3.69	62.4	2.7	23.0
West: Greenbag Road (CR 857)										
5	L2	0.22	0.27	4.0	0.07	13.8	4.18	133.3	4.0	33.4
2	T1	1.71	2.05	8.5	0.13	96.7	17.08	459.2	13.8	33.4

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Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
East: Greenbag Road (CR 857)							
6	T1	167.48	19.4	173.3	0.21	0.016	0.242
16	R2	58.59	5.0	44.4	0.06	0.004	0.053
		226.08	24.3	217.7	0.27	0.020	0.294
North: Mississippi Avenue							
7	L2	18.98	1.3	11.5	0.01	0.001	0.006
14	R2	32.18	3.0	27.2	0.02	0.002	0.021
		51.16	4.3	38.7	0.03	0.003	0.026
West: Greenbag Road (CR 857)							
5	L2	55.88	3.5	31.1	0.04	0.003	0.018
2	T1	173.25	10.9	97.2	0.14	0.009	0.053
		229.13	14.4	128.2	0.18	0.012	0.071
INTERSECTION:		506.37	43.1	384.6	0.47	0.036	0.392

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
East: Greenbag Road (CR 857)							
6	T1	0.31	17.6	316.3	0.38	0.030	0.441
16	R2	0.30	24.3	228.0	0.29	0.021	0.270
		0.30	19.0	293.1	0.36	0.028	0.396
North: Mississippi Avenue							
7	L2	0.32	28.8	192.1	0.12	0.016	0.098
14	R2	0.32	20.5	270.3	0.19	0.022	0.205
		0.32	23.0	241.0	0.16	0.020	0.165
West: Greenbag Road (CR 857)							

```
    5  L2           0.26   38.3   144.7    0.19   0.014   0.084
    2  T1           0.23   42.1   131.5    0.18   0.012   0.072
                 ----------------------------------------------
                    0.24   41.2   134.5    0.19   0.013   0.075
--------------------------------------------------------------------
 INTERSECTION:      0.27   26.8   207.1    0.25   0.019   0.211
--------------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.  95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         730  1103  0.662   12.7  0.61    8.2  207.6  1600.0
-------------------------------------------------------------
 North: Mississippi Avenue
 1         158   783  0.202    6.8  0.55    0.9   21.9  1600.0
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         203  1332  0.153    4.0  0.07    0.7   17.0   225.0T
 2         720  1332  0.541    8.5  0.13    4.2  104.9  1600.0
-------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        730     150  1103   0.662  100
----------------------------------------
 North: Mississippi Avenue
 1        158     150   783   0.202  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        203     150  1332   0.153  100
 2        720     150  1332   0.541  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

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Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV  Basic   Sat   Delay   Queue    Length
        (veh/h)       Satf.    x     sec       ft      ft
------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        730      1          0.662   12.7    208     1600
       -----------------------------------------------------
          730      1          0.662   12.7    208
------------------------------------------------------------
 North: Mississippi Avenue
 1        158      1          0.202    6.8     22     1600
       -----------------------------------------------------
          158      1          0.202    6.8     22
------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        203      1          0.153    4.0     17      225
 2        720      1          0.541    8.5    105     1600
       -----------------------------------------------------
          924      1          0.541    7.5    105
============================================================
 ALL VEHICLES
        Total     %           Max   Aver.    Max
        Flow     HV           X    Delay   Queue
        1812      1          0.662    9.6    208
============================================================
Peak flow period = 15 minutes.
```

```
Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                        Average  Driver
 Lane   Satn    Satn    Satn    Satn     Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1       24.9   1380    2.61    95.15    25.30    1.92
-----------------------------------------------------------
 North: Mississippi Avenue
 1       19.3   1380    2.61    73.84    25.13    1.72
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7   1420    2.54    88.12    25.20    1.81
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                          ------------------  Delay (seconds/veh)  -------------------
        Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane   Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.      x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.662    NA      NA     3.3   6.6   6.1  12.7   6.3   8.4   1.4   7.0   0.0   12.7
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.202    NA      NA     4.6   5.6   1.2   6.8   4.3   4.3   0.0   4.3   0.0    6.8
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.153    NA      NA     2.7   3.5   0.5   4.0   5.0   3.1   0.0   3.1   0.0    4.0
 2      0.541    NA      NA     2.7   5.4   3.1   8.5   6.5   6.6   0.0   6.6   0.0    8.5
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)     Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green            No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1    0.662    NA      NA     0.6    2.3   1.0    3.3    8.2  0.05   0.13    0.0    NA
-------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1    0.202    NA      NA     0.0    0.4   0.0    0.4    0.9  0.01   0.01    0.0    NA
-------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1    0.153    NA      NA     0.0    0.3   0.0    0.3    0.7  0.03   0.08    NA     0.0
 2    0.541    NA      NA     0.0    1.7   0.0    1.7    4.2  0.03   0.07    0.0    NA
-------------------------------------------------------------------------------------------

  SIDRA Standard models are used for Back of Queue estimation since
```

HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.662	NA	NA	14.1	57.4	26.2	83.5	207.6	0.05	0.13	0.0	NA
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	8.8	0.0	8.8	21.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	6.8	0.0	6.8	17.0	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	42.2	0.0	42.2	104.9	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.662	NA	NA	0.6	2.6	4.7
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	0.3	0.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	0.2	0.4
2	0.541	NA	NA	0.0	1.7	3.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.662	NA	NA	14.1	65.2	118.3
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	7.5	13.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	5.6	10.2
2	0.541	NA	NA	0.0	43.1	78.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.662	3.3	4.3	6.0	7.0	8.2	9.1	9.8
North: Mississippi Avenue								
1	0.202	0.4	0.5	0.6	0.7	0.9	1.0	1.0
West: Greenbag Road (CR 857)								
1	0.153	0.3	0.4	0.5	0.6	0.7	0.7	0.8
2	0.541	1.7	2.2	3.1	3.5	4.2	4.6	5.0

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.662	83.5	108.1	152.5	176.5	207.6	230.4	247.7
North: Mississippi Avenue								
1	0.202	8.8	11.4	16.1	18.7	21.9	24.3	26.2
West: Greenbag Road (CR 857)								
1	0.153	6.8	8.9	12.5	14.5	17.0	18.9	20.3
2	0.541	42.2	54.6	77.0	89.2	104.9	116.4	125.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.662	NA	NA	0.52	0.09	0.00	0.61	443.3	0.17	126.7	0.69	0.86
North: Mississippi Avenue												
1	0.202	NA	NA	0.55	0.00	0.00	0.55	87.6	0.00	0.0	0.59	0.59
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.07	0.00	0.00	0.07	13.8	0.00	0.0	0.17	0.17
2	0.541	NA	NA	0.13	0.00	0.00	0.13	96.7	0.00	0.0	0.30	0.30

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	538.7	191.4	730.1
%HV (all designations)	2.0	0.0	1.5
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	59.1	98.9	158.1
%HV (all designations)	0.0	1.0	0.6
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	203.2	720.4	923.7
%HV (all designations)	1.0	1.0	1.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT

Flow Rate	527.9	191.4	719.3
Mov Class %	98.0	100.0	98.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	59.1	97.9	157.1
Mov Class %	100.0	99.0	99.4
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	201.2	713.2	914.4
Mov Class %	99.0	99.0	99.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	10.8	0.0	10.8
Mov Class %	2.0	0.0	1.5
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	0.0	1.0	1.0
Mov Class %	0.0	1.0	0.6
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	2.0	7.2	9.2
Mov Class %	1.0	1.0	1.0
Flow Scale	1.00	1.00	-
Peak Flow Factor	0.93	0.93	-
Residual Demand	0.0	0.0	0.0

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - PM Peak

Site ID: 857-Miss
Roundabout

LANE FLOW RATES AT STOP LINE (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	527.9	191.4	719.3
HV	10.8	*	10.8
Total	538.7	191.4	730.1
Approach	538.7	191.4	730.1

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	59.1	97.9	157.1
HV	*	1.0	1.0
Total	59.1	98.9	158.1
Approach	59.1	98.9	158.1

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	201.2	*	201.2
HV	2.0	*	2.0

```
   Total           203.2       *   203.2
 Lane  2
   LV                *   713.2   713.2
   HV                *     7.2     7.2
   Total             *   720.4   720.4
-----------------------------------------
 Approach          203.2   720.4   923.7
-----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
-----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
-----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - PM Peak

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

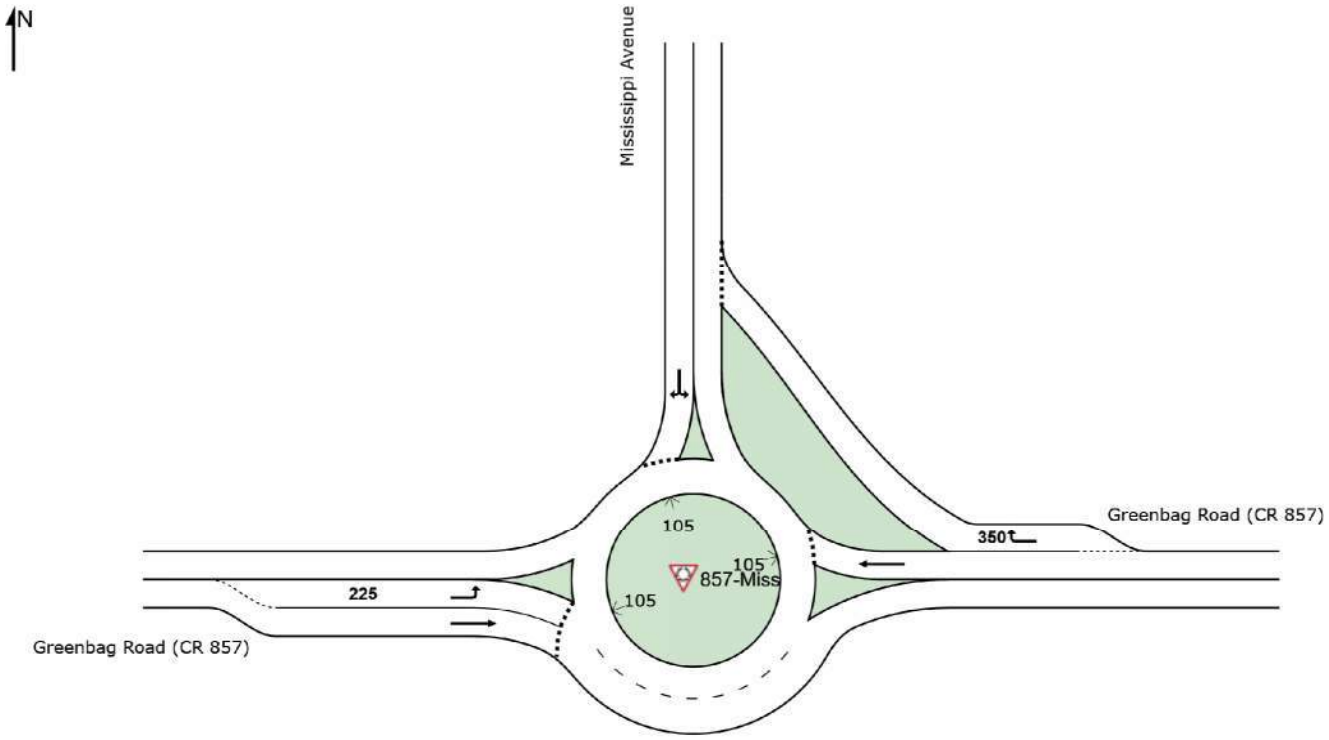
Go to Table Links (Top)

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:06:29 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\Capacity & Queue Analyses\2048 Improvement Options\2019-03-26 Revised Improvement Options\Greenbag & Mississippi\Roundabout\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

SITE LAYOUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout



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Project: C:\Users\msouthern\Desktop\Projects\18-141 WVDOH Greenbag Road PIE Study\06 Traffic\B - Analyses\2019-04-11 Updated Mississippi \Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	645	4.0	0.557	9.7	LOS A	3.7	95.7	0.51	0.35	0.51	33.2
16	R2	256	10.0	0.233	5.4	LOS A	1.0	26.4	0.34	0.21	0.34	34.2
Approach		901	5.7	0.557	8.5	LOS A	3.7	95.7	0.46	0.31	0.46	33.5
North: Mississippi Avenue												
7	L2	167	18.0	0.544	15.7	LOS B	3.4	94.5	0.74	0.98	1.22	22.0
14	R2	163	11.0	0.544	15.3	LOS B	3.4	94.5	0.74	0.98	1.22	21.1
Approach		330	14.5	0.544	15.5	LOS B	3.4	94.5	0.74	0.98	1.22	21.6
West: Greenbag Road (CR 857)												
5	L2	171	5.0	0.151	4.5	LOS A	0.6	16.1	0.33	0.21	0.33	33.0
2	T1	377	2.0	0.324	6.2	LOS A	1.6	41.4	0.40	0.27	0.40	34.6
Approach		548	2.9	0.324	5.7	LOS A	1.6	41.4	0.37	0.25	0.37	34.1
All Vehicles		1779	6.5	0.557	8.9	LOS A	3.7	95.7	0.48	0.42	0.57	30.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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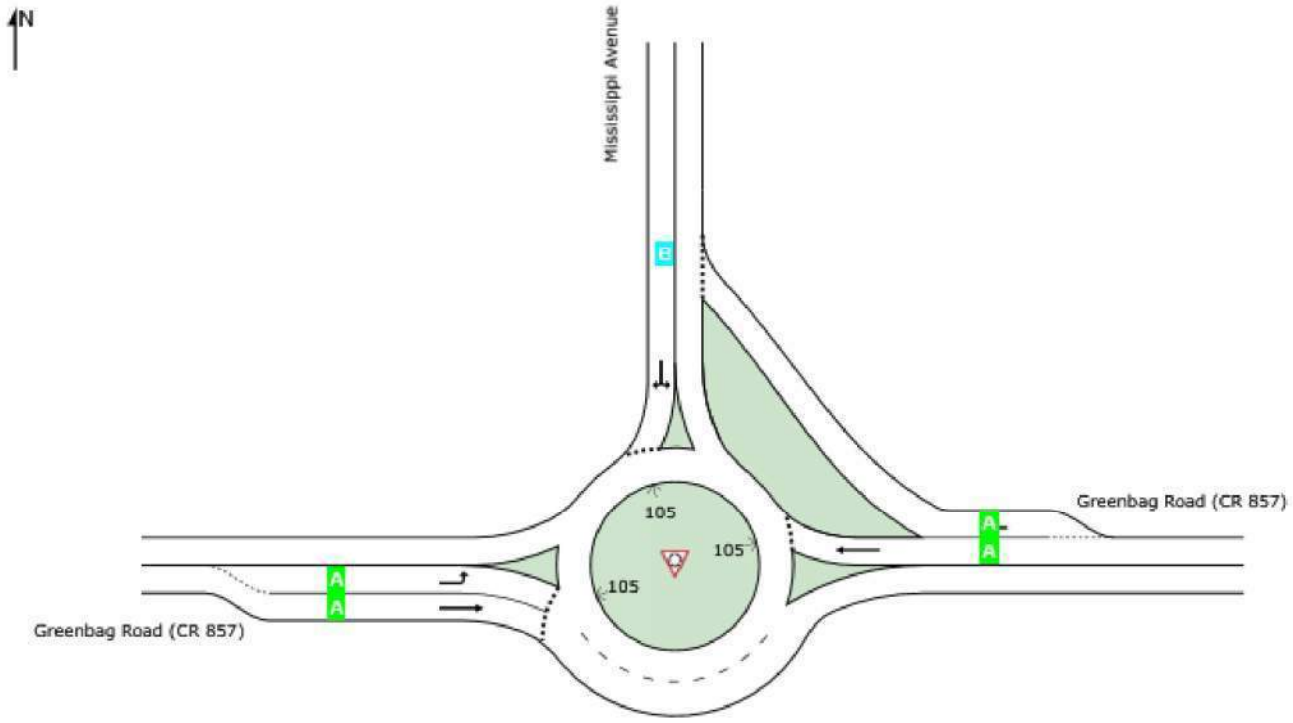
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	B	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

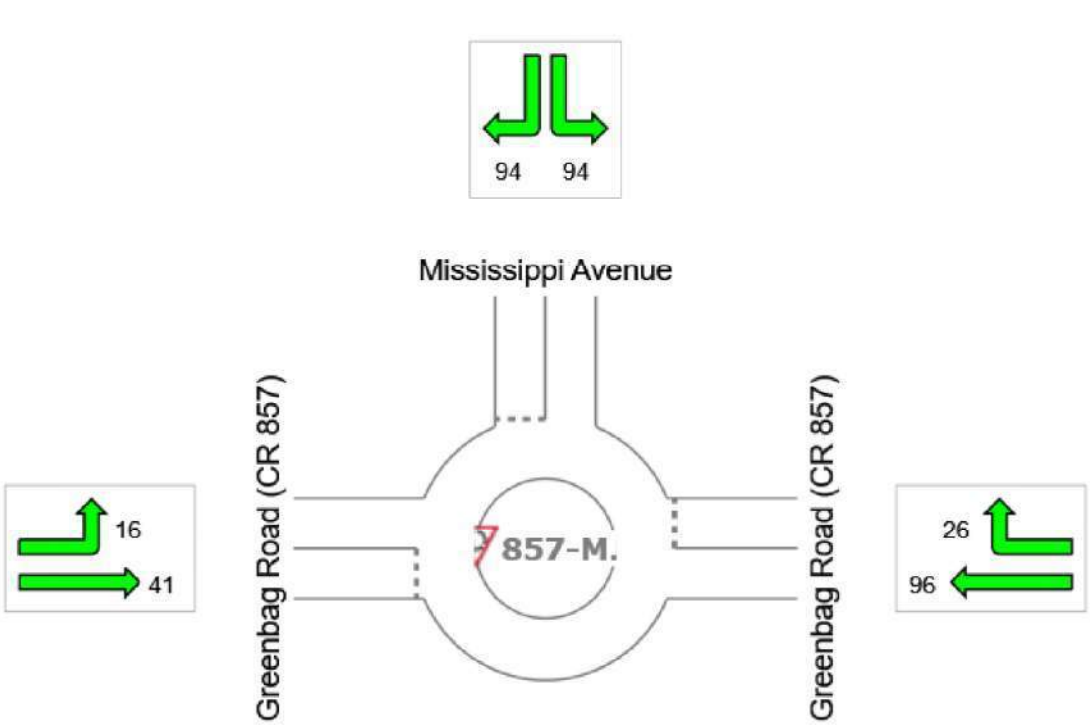
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	96	94	41	96



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - AM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

Roundabouts
- Roundabout Basic Parameters
- Roundabout Circulating / Exiting Stream Parameters
- Roundabout Gap Acceptance Parameters
- Roundabout Flow Rates

Movements
- Intersection Negotiation and Travel Data
- Movement Capacity and Performance Parameters
- Fuel Consumption, Emissions and Cost

Lanes
- Lane Performance and Capacity Information
- Lane, Approach and Intersection Performance
- Driver Characteristics
- Lane Delays
- Lane Queues
- Lane Queue Percentiles
- Lane Stops

Flow Rates
- Origin-Destination Flow Rates (Total)
- Origin-Destination Flow Rates by Movement Class
- Lane Flow Rates

Other
- Parameter Settings Summary
- Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	2	Excl. Slip	171	1.05	179	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	645	1.04	671	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

N	L2	1	Subdominant	167	1.18	198	0.0	0.0	N	-	16.0	0.00	0.000
E	T1	2	Dominant	167	1.18	198	0.0	0.0	N	-	16.0	0.00	0.000

Roundabout Capacity Model: US HCM 6

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
East: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	T1	1	Dominant	0.00	0.000	N	1.04	4.54	109.7	2.54
N	R2	2	Excl. Slip	0.00	0.000	N	1.10	4.54	109.7	2.54
North: Mississippi Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.18	4.98	187.6	2.61
W	R2	1	Dominant	0.00	0.000	N	1.11	4.98	187.6	2.61
West: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.05	4.54	106.9	2.54
E	T1	2	Dominant	0.00	0.000	N	1.02	4.54	106.9	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	171	179	100.0%
Total	171	179	
North: Mississippi Avenue			
1	645	671	100.0%
Total	645	671	
West: Greenbag Road (CR 857)			
1	167	198	100.0%
Total	167	198	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

EXITING LANE FLOW RATES

Lane No.	Exiting Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	171	179	100.0%
Total	171	179	

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
East: Greenbag Road (CR 857)			
1	0	645	645
2	256	0	256
Total	256	645	901

```
  North: Mississippi Avenue
  1           163      167      330
  Total       163      167      330
---------------------------------------
  West: Greenbag Road (CR 857)
  1             0      171      171
  2           377        0      377
  Total       377      171      548
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed   Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s     veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1       36.5    33.2    3362.1#   69.0#     410.9       410.9      12.4
            North    R2       36.4    34.2    3269.1#   65.1#     158.4       158.4       4.6
-------------------------------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2       24.3    22.0    3351.9#  103.8#     106.3       106.3       4.8
             West    R2       23.2    21.1    3351.9#  108.3#     103.3       103.3       4.9
-------------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2       34.4    33.0    3464.3#   71.5#     112.1       112.1       3.4
             East    T1       36.6    34.6    3365.6#   66.4#     240.1       240.1       6.9
-------------------------------------------------------------------------------------------------
 ALL VEHICLES:                33.9    30.5    3357.4#   75.0#    1131.3      1131.3      37.1
-------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                           Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed   Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1     218.2   25.7  162.1   1600     488     NA
            North    R2     156.0   22.6   69.1   1600     488     NA
-------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2      62.8   16.0  246.6   1600     488     NA
             West    R2     131.9   21.2   62.2   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2      67.3   16.5  264.3   1600     488     NA
             East    T1     175.9   23.7  165.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            ------------   ------------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed     Delay
 ID   Turn   mph     mph    mph   mph      mph       sec
-----------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1    40.0   25.7   25.7  40.0     31.6      0.0
   16  R2    40.0   22.6   22.6  40.0     32.3      0.0
-----------------------------------------------------------
North: Mississippi Avenue
    7  L2    25.0   16.0   16.0  25.0     18.1      0.0
   14  R2    25.0   21.2   21.2  25.0     18.1      0.0
-----------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2    40.0   16.5   16.5  40.0     26.5      0.0
    2  T1    40.0   23.7   23.7  40.0     29.9      0.0
-----------------------------------------------------------
```

```
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

Go to Table Links (Top)

Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


MOVEMENT CAPACITY PARAMETERS

-------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
-------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1  #     645    171    179    1160   0.85     53  0.557*
   16  R2  #     256    171    179    1096   0.85    264  0.233
-------------------------------------------------------------
North: Mississippi Avenue
    7  L2  #     167    645    671     308   0.85     56  0.544
   14  R2  #     163    645    671     299   0.85     56  0.544
-------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2  #     171    167    198    1130   0.85    462  0.151
    2  T1  #     377    167    198    1163   0.85    162  0.324
-------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1   1.74    2.09     9.7   0.35   225.5 16.25    410.9     12.4     33.2
   16  R2   0.39    0.46     5.4   0.21    54.5  5.44    158.4      4.6     34.2
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
    7  L2   0.73    0.87    15.7   0.98   164.7  8.62    106.3      4.8     22.0
   14  R2   0.69    0.83    15.3   0.98   160.1  8.44    103.3      4.9     21.1
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2   0.21    0.26     4.5   0.21    35.5  3.71    112.1      3.4     33.0
    2  T1   0.65    0.78     6.2   0.27   101.1  8.53    240.1      6.9     34.6
-------------------------------------------------------------------------------------------
```

Go to Table Links (Top)

Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Total   Total    Total    Total    Total    Total
                  $/h     gal/h    kg/h     kg/h     kg/h     kg/h
-----------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1         202.91   26.0    234.2     0.26    0.020    0.571
   16  R2          75.51    7.7     69.3     0.08    0.006    0.213
                 ---------------------------------------------------
                  278.42   33.7    303.4     0.34    0.026    0.785
-----------------------------------------------------------------
North: Mississippi Avenue
    7  L2          72.14    6.3     57.8     0.05    0.005    0.222
   14  R2          71.12    8.2     75.3     0.06    0.006    0.315
                 ---------------------------------------------------
                  143.26   14.5    133.1     0.11    0.011    0.537
-----------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2          51.68    3.5     31.5     0.04    0.003    0.050
    2  T1          88.65    5.9     52.9     0.07    0.005    0.044
                 ---------------------------------------------------
                  140.33    9.4     84.4     0.11    0.008    0.095
-----------------------------------------------------------------
 INTERSECTION:    562.00   57.6    520.9     0.56    0.045    1.416
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Rate    Eff.     Rate     Rate     Rate     Rate
                  $/mi    mpg      g/km     g/km     g/km     g/km
-----------------------------------------------------------------
```

```
East: Greenbag Road (CR 857)
    6  T1           0.31   15.8   354.1    0.40   0.031   0.864
   16  R2           0.30   20.7   271.7    0.31   0.023   0.837
                 ----------------------------------------------
                   0.30   16.9   331.2    0.37   0.028   0.856
--------------------------------------------------------------------
North: Mississippi Avenue
    7  L2           0.42   16.8   337.7    0.29   0.031   1.299
   14  R2           0.43   12.6   452.8    0.34   0.034   1.893
                 ----------------------------------------------
                   0.42   14.4   394.5    0.31   0.033   1.592
--------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2           0.29   32.0   174.6    0.22   0.017   0.280
    2  T1           0.23   40.6   136.8    0.19   0.013   0.114
                 ----------------------------------------------
                   0.25   37.4   148.8    0.20   0.014   0.167
--------------------------------------------------------------------
 INTERSECTION:     0.31   19.6   286.1    0.31   0.025   0.778
--------------------------------------------------------------------
```

Go to Table Links (Top)

Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

-------------------------------------------------------------------
                                                Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.   95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
-------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         645  1160  0.557    9.7  0.35    3.7   95.7  1600.0
 2         256  1096  0.233    5.4  0.21    1.0   26.4   350.0T
-------------------------------------------------------------------
 North: Mississippi Avenue
 1         330   608  0.544   15.5  0.98    3.4   94.5  1600.0
-------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         171  1130  0.151    4.5  0.21    0.6   16.1   225.0T
 2         377  1163  0.324    6.2  0.27    1.6   41.4  1600.0
-------------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        645     150  1160   0.557  100
 2        256     150  1096   0.233  100
----------------------------------------
 North: Mississippi Avenue
 1        330     150   608   0.544  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        171     150  1130   0.151  100
 2        377     150  1163   0.324  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue     Length
        (veh/h)       Satf.    x     sec       ft       ft
-------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        645      4          0.557    9.7     96     1600
 2        256     10          0.233    5.4     26      350
         ---------------------------------------------------
          901      6          0.557    8.5     96
-------------------------------------------------------------
 North: Mississippi Avenue
 1        330     15          0.544   15.5     94     1600
```

```
        ---------------------------------------------------
          330     15          0.544   15.5     94
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        171      5          0.151    4.5     16      225
 2        377      2          0.324    6.2     41     1600
        ---------------------------------------------------
          548      3          0.324    5.7     41
===========================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1779      6          0.557    8.9     96
===========================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                        Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy    Spacing   Space    Time
          mph     veh/h    sec       ft       ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        25.7    1420     2.54     95.59    25.80    1.85
 2      NA - Short Lane
-----------------------------------------------------------
 North: Mississippi Avenue
 1        18.6    1380     2.61     71.20    27.91    1.59
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2        23.7    1420     2.54     88.12    25.40    1.80
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                             ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor    Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green             dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.557    NA      NA      3.1   5.9   3.8   9.7   6.8   6.3   0.0   6.3   0.0    9.7
 2      0.233    NA      NA      3.3   4.5   1.0   5.4   4.8   3.8   0.0   3.8   0.0    5.4
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.544    NA      NA      5.9   8.6   6.8  15.5   4.3  12.3   2.7   9.7   0.0   15.5
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.151    NA      NA      3.2   3.9   0.6   4.5   5.0   2.9   0.0   2.9   0.0    4.5
 2      0.324    NA      NA      3.1   4.7   1.5   6.2   6.5   3.6   0.0   3.6   0.0    6.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.0	1.5	0.0	1.5	3.7	0.02	0.06	0.0	NA
2	0.233	NA	NA	0.0	0.4	0.0	0.4	1.0	0.03	0.08	NA	0.0
North: Mississippi Avenue												
1	0.544	NA	NA	0.4	0.9	0.4	1.4	3.4	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	0.2	0.0	0.2	0.6	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	0.7	0.0	0.7	1.6	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.0	38.5	0.0	38.5	95.7	0.02	0.06	0.0	NA
2	0.233	NA	NA	0.0	10.6	0.0	10.6	26.4	0.03	0.08	NA	0.0
North: Mississippi Avenue												
1	0.544	NA	NA	11.6	26.5	11.5	38.0	94.5	0.02	0.06	0.0	NA
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.0	6.5	0.0	6.5	16.1	0.03	0.07	NA	0.0
2	0.324	NA	NA	0.0	16.7	0.0	16.7	41.4	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.557	NA	NA	0.0	1.7	3.2
2	0.233	NA	NA	0.0	0.4	0.7
North: Mississippi Avenue						
1	0.544	NA	NA	0.4	1.4	2.6
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	0.2	0.4
2	0.324	NA	NA	0.0	0.6	1.2

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.557	NA	NA	0.0	44.9	81.5
2	0.233	NA	NA	0.0	10.4	19.0
North: Mississippi Avenue						
1	0.544	NA	NA	11.6	39.6	71.9
West: Greenbag Road (CR 857)						
1	0.151	NA	NA	0.0	5.6	10.1
2	0.324	NA	NA	0.0	16.5	29.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.557	1.5	1.9	2.7	3.2	3.7	4.1	4.4
2	0.233	0.4	0.5	0.7	0.8	1.0	1.1	1.2
North: Mississippi Avenue								
1	0.544	1.4	1.8	2.5	2.9	3.4	3.8	4.0
West: Greenbag Road (CR 857)								
1	0.151	0.2	0.3	0.5	0.5	0.6	0.7	0.7
2	0.324	0.7	0.8	1.2	1.4	1.6	1.8	1.9

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.557	38.5	49.8	70.3	81.4	95.7	106.2	114.1
2	0.233	10.6	13.8	19.4	22.5	26.4	29.3	31.5
North: Mississippi Avenue								
1	0.544	38.0	49.2	69.4	80.3	94.5	104.9	112.7
West: Greenbag Road (CR 857)								
1	0.151	6.5	8.4	11.8	13.7	16.1	17.8	19.2
2	0.324	16.7	21.6	30.4	35.2	41.4	46.0	49.4

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.557	NA	NA	0.35	0.00	0.00	0.35	225.5	0.00	0.0	0.51	0.51
2	0.233	NA	NA	0.21	0.00	0.00	0.21	54.5	0.00	0.0	0.34	0.34
North: Mississippi Avenue												
1	0.544	NA	NA	0.74	0.24	0.00	0.98	324.8	0.48	157.1	0.74	1.22
West: Greenbag Road (CR 857)												
1	0.151	NA	NA	0.21	0.00	0.00	0.21	35.5	0.00	0.0	0.33	0.33
2	0.324	NA	NA	0.27	0.00	0.00	0.27	101.1	0.00	0.0	0.40	0.40

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	645.3	255.8	901.2
%HV (all designations)	4.0	10.0	5.7
From NORTH To:	E	W	
Turn:	L2	R2	TOT
Flow Rate	167.4	162.8	330.2
%HV (all designations)	18.0	11.0	14.5
From WEST To:	N	E	
Turn:	L2	T1	TOT
Flow Rate	170.9	376.7	547.7

```
 %HV (all designations)        5.0     2.0     2.9
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate           619.5   230.2   849.8
 Mov Class %          96.0    90.0    94.3
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate           137.3   144.9   282.2
 Mov Class %          82.0    89.0    85.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate           162.4   369.2   531.6
 Mov Class %          95.0    98.0    97.1
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

FLOW RATES for Heavy Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate            25.8    25.6    51.4
 Mov Class %           4.0    10.0     5.7
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate            30.1    17.9    48.0
 Mov Class %          18.0    11.0    14.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate             8.5     7.5    16.1
 Mov Class %           5.0     2.0     2.9
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.86    0.86       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-----------------------------------------
```

From EAST To:	W	N	
Turn:	T1	R2	TOT
Lane 1			
LV	619.5	*	619.5
HV	25.8	*	25.8
Total	645.3	*	645.3
Lane 2			
LV	*	230.2	230.2
HV	*	25.6	25.6
Total	*	255.8	255.8
Approach	645.3	255.8	901.2

From NORTH To:	E	W	
Turn:	L2	R2	TOT
Lane 1			
LV	137.3	144.9	282.2
HV	30.1	17.9	48.0
Total	167.4	162.8	330.2
Approach	167.4	162.8	330.2

From WEST To:	N	E	
Turn:	L2	T1	TOT
Lane 1			
LV	162.4	*	162.4
HV	8.5	*	8.5
Total	170.9	*	170.9
Lane 2			
LV	*	369.2	369.2
HV	*	7.5	7.5
Total	*	376.7	376.7
Approach	170.9	376.7	547.7

* Movement not allocated to the lane

EXIT LANE FLOW RATES

Movement Class:	LV	HV	TOT
Exit: EAST			
Lane: 1	506.5	37.7	544.2
Total	506.5	37.7	544.2
Exit: NORTH			
Lane: 1	392.6	34.1	426.7
Total	392.6	34.1	426.7
Exit: WEST			
Lane: 1	764.4	43.7	808.1
Total	764.4	43.7	808.1

* Movement not allocated to the lane

DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

Movement Class:	LV	HV	TOT
Exit: EAST			
Lane: 1	506.5	37.7	544.2
Total	506.5	37.7	544.2
Exit: NORTH			
Lane: 1	392.6	34.1	426.7
Total	392.6	34.1	426.7
Exit: WEST			
Lane: 1	764.4	43.7	808.1
Total	764.4	43.7	808.1

* Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - AM Peak - Modified 2

Site ID: 857-Miss
Roundabout

* Basic Parameters:
Intersection Type: Roundabout

```
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - AM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Thursday, April 11, 2019 10:16:19 AM
Project: C:\Users\msouthern\Desktop\Projects\18-141 WVDOH Greenbag Road PIE Study\06 Traffic\B - Analyses\2019-04-11 Updated Mississippi\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

MOVEMENT SUMMARY

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
East: Greenbag Road (CR 857)												
6	T1	539	2.0	0.466	8.1	LOS A	2.8	70.5	0.48	0.34	0.48	34.0
16	R2	191	0.0	0.162	4.5	LOS A	0.7	17.7	0.34	0.22	0.34	34.9
Approach		730	1.5	0.466	7.2	LOS A	2.8	70.5	0.44	0.31	0.44	34.2
North: Mississippi Avenue												
7	L2	59	0.0	0.202	6.7	LOS A	0.9	21.9	0.59	0.55	0.59	24.2
14	R2	99	1.0	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.0
Approach		158	0.6	0.202	6.8	LOS A	0.9	21.9	0.59	0.55	0.59	23.4
West: Greenbag Road (CR 857)												
5	L2	203	1.0	0.153	4.0	LOS A	0.7	17.0	0.17	0.07	0.17	33.4
2	T1	720	1.0	0.541	8.5	LOS A	4.2	104.9	0.30	0.13	0.30	33.4
Approach		924	1.0	0.541	7.5	LOS A	4.2	104.9	0.27	0.12	0.27	33.4
All Vehicles		1812	1.2	0.541	7.3	LOS A	4.2	104.9	0.37	0.23	0.37	32.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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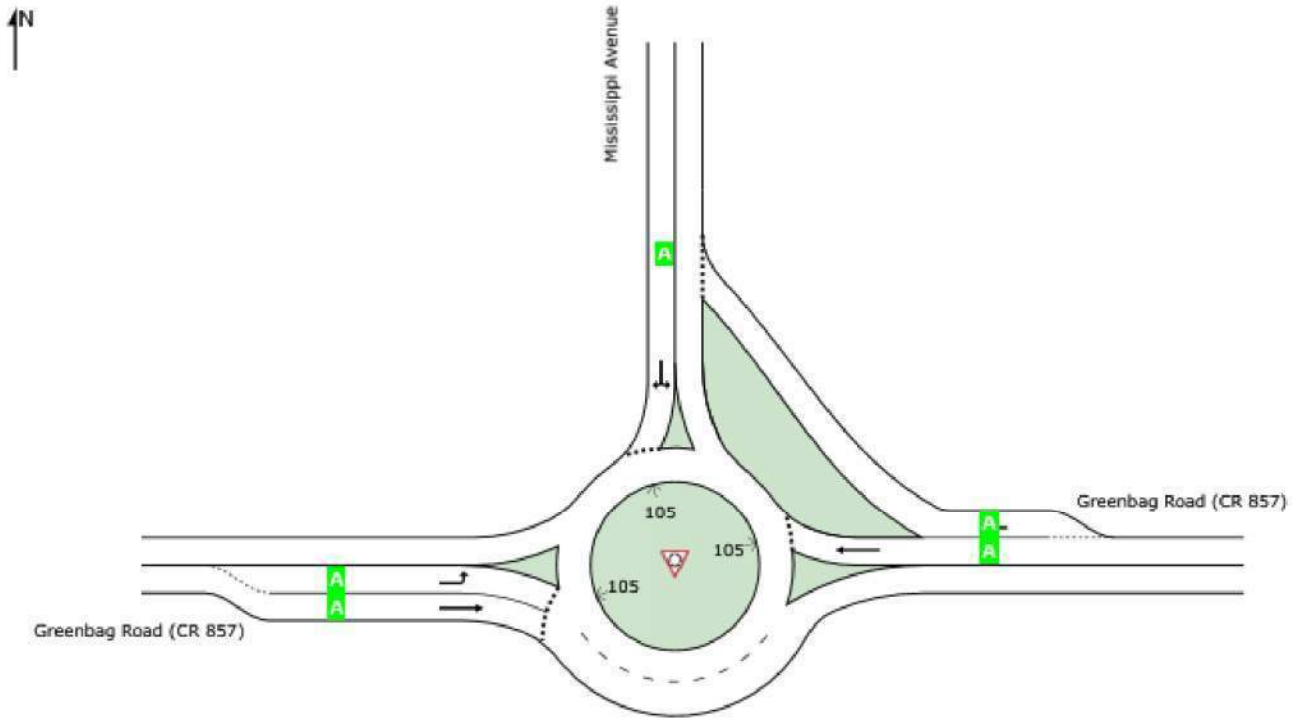
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	A	A	A	A



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

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QUEUE DISTANCE (%ILE)

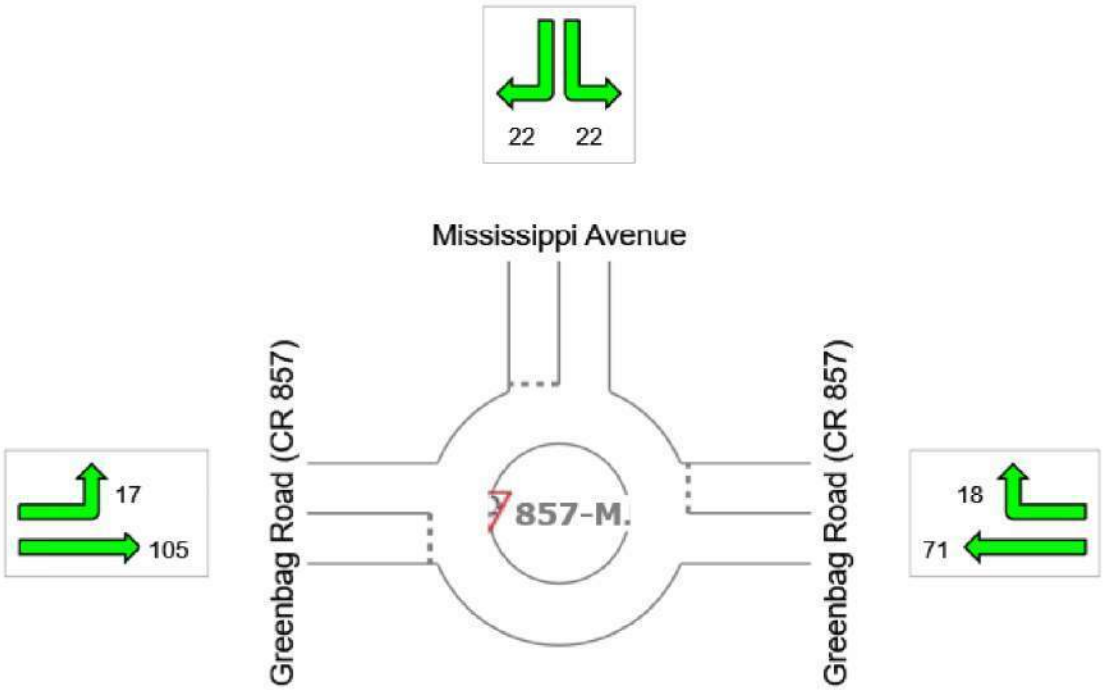
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches			Intersection
	East	North	West	
Vehicle Queue (%ile)	71	22	105	105



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857-Miss [Greenbag & Mississippi - PM Peak - Modified 2]

Roundabout - Single Lane
With EB Greenbag Rd Left Turn Lane and Through Lane
With WB Greenbag Rd Right Turn Lane (by-pass) and Through
Site Category: PM Peak
Roundabout

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Roundabouts

Roundabout Basic Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
East: Greenbag Road (CR 857)										
105.0*	28.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N
North: Mississippi Avenue										
105.0*	28.0*	161.0*	65.0*	30.0*	1	1	14.00*	1600	NA	0.0N
West: Greenbag Road (CR 857)										
105.0*	46.0*	179.0*	65.0*	30.0*	1	2	14.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

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Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
East: Greenbag Road (CR 857)													
W	T1	1	Dominant	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
N	R2	2	Excl. Slip	203	1.01	205	0.0	0.0	N	-	16.5	0.00	0.000
North: Mississippi Avenue													
E	L2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
W	R2	1	Dominant	539	1.02	549	0.0	0.0	N	-	25.7	0.00	0.000
West: Greenbag Road (CR 857)													

N	L2	1	Subdominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000
E	T1	2	Dominant	59	1.00	59	0.0	0.0	N	-	16.0	0.00	0.000

Roundabout Capacity Model: US HCM 6

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Roundabout Gap Acceptance Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
East: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	T1	1	Dominant	0.00	0.000	N	1.02	4.54	109.7	2.54
N	R2	2	Excl. Slip	0.00	0.000	N	1.00	4.54	109.7	2.54
North: Mississippi Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.00	4.98	187.6	2.61
W	R2	1	Dominant	0.00	0.000	N	1.01	4.98	187.6	2.61
West: Greenbag Road (CR 857)										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.01	4.54	106.9	2.54
E	T1	2	Dominant	0.00	0.000	N	1.01	4.54	106.9	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

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Roundabout Flow Rates
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	203	205	100.0%
Total	203	205	
North: Mississippi Avenue			
1	539	549	100.0%
Total	539	549	
West: Greenbag Road (CR 857)			
1	59	59	100.0%
Total	59	59	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the SIDRA Standard roundabout capacity model.

EXITING LANE FLOW RATES

Lane No.	Exiting Flow Rate veh/h	pcu/h	Percent
East: Greenbag Road (CR 857)			
1	203	205	100.0%
Total	203	205	

APPROACH LANE FLOW RATES

Lane No.	Approach Flows (veh/h) Out	To Downst	Total
East: Greenbag Road (CR 857)			
1	0	539	539
2	191	0	191
Total	191	539	730

```
  North: Mississippi Avenue
  1            99       59      158
  Total        99       59      158
--------------------------------------
  West: Greenbag Road (CR 857)
  1             0      203      203
  2           720        0      720
  Total       720      203      923
--------------------------------------
```

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Movements

Intersection Negotiation and Travel Data
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-----------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed   Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s     veh-mi/h    veh-mi/h   veh-h/h
-----------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1       36.7    34.0    3362.1#   67.4#     343.0       343.0      10.1
            North    R2       36.5    34.9    3269.1#   63.9#     118.5       118.5       3.4
-----------------------------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2       25.3    24.2    3331.6#   94.0#      37.3        37.3       1.5
             West    R2       24.1    23.0    3331.6#   98.6#      62.4        62.4       2.7
-----------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2       34.9    33.4    3464.3#   70.8#     133.3       133.3       4.0
             East    T1       36.9    33.4    3365.6#   68.7#     459.2       459.2      13.8
-----------------------------------------------------------------------------------------------
 ALL VEHICLES:                35.5    32.5    3362.5#   70.5#    1153.8      1153.8      35.5
-----------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                           Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed   Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
East: Greenbag Road (CR 857)
             West    T1     218.2   25.7  162.1   1600     488     NA
            North    R2     156.0   22.6   69.1   1600     488     NA
-------------------------------------------------------------------------
North: Mississippi Avenue
             East    L2      62.8   16.0  246.6   1600     488     NA
             West    R2     131.9   21.2   62.2   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road (CR 857)
            North    L2      67.3   16.5  264.3   1600     488     NA
             East    T1     175.9   23.7  165.6   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            ------------   ------------   Move-up   Geom
 Mov        Cruise  Negn   Negn Cruise    Speed     Delay
 ID   Turn   mph     mph    mph   mph      mph       sec
-----------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1    40.0   25.7   25.7  40.0     29.4      0.0
   16  R2    40.0   22.6   22.6  40.0     29.2      0.0
-----------------------------------------------------------
North: Mississippi Avenue
    7  L2    25.0   16.0   16.0  25.0     18.6      0.0
   14  R2    25.0   21.2   21.2  25.0     18.6      0.0
-----------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2    40.0   16.5   16.5  40.0     26.5      0.0
    2  T1    40.0   23.7   23.7  40.0     38.1      0.0
-----------------------------------------------------------
```

```
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


MOVEMENT CAPACITY PARAMETERS

--------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
--------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1  #     539    203    205    1155   0.85     82  0.466
   16  R2  #     191    203    205    1178   0.85    423  0.162
--------------------------------------------------------------
North: Mississippi Avenue
    7  L2  #      59    539    549     293   0.85    321  0.202
   14  R2  #      99    539    549     490   0.85    321  0.202
--------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2  #     203     59     59    1332   0.85    457  0.153
    2  T1  #     720     59     59    1332   0.85     57  0.541*
--------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate               (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1   1.22    1.46     8.1   0.34   183.8 13.05    343.0    10.1     34.0
   16  R2   0.24    0.28     4.5   0.22    42.2  3.72    118.5     3.4     34.9
-------------------------------------------------------------------------------------------
North: Mississippi Avenue
    7  L2   0.11    0.13     6.7   0.55    32.8  2.14     37.3     1.5     24.2
   14  R2   0.19    0.22     6.8   0.55    54.8  3.69     62.4     2.7     23.0
-------------------------------------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2   0.22    0.27     4.0   0.07    13.8  4.18    133.3     4.0     33.4
    2  T1   1.71    2.05     8.5   0.13    96.7 17.08    459.2    13.8     33.4
-------------------------------------------------------------------------------------------
```

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Fuel Consumption, Emissions and Cost
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Total   Total    Total    Total    Total    Total
                  $/h     gal/h    kg/h     kg/h     kg/h     kg/h
-----------------------------------------------------------------
East: Greenbag Road (CR 857)
    6  T1         157.59   19.4   174.0    0.21    0.016    0.272
   16  R2          47.34    4.0    35.3    0.05    0.003    0.012
                 ---------------------------------------------
                  204.93   23.4   209.3    0.26    0.019    0.284
-----------------------------------------------------------------
North: Mississippi Avenue
    7  L2          18.98    1.3    11.5    0.01    0.001    0.006
   14  R2          32.18    3.0    27.2    0.02    0.002    0.021
                 ---------------------------------------------
                   51.16    4.3    38.7    0.03    0.003    0.026
-----------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2          55.88    3.5    31.1    0.04    0.003    0.018
    2  T1         173.25   10.9    97.2    0.14    0.009    0.053
                 ---------------------------------------------
                  229.13   14.4   128.2    0.18    0.012    0.071
-----------------------------------------------------------------
 INTERSECTION:    485.22   42.1   376.2    0.46    0.035    0.382
-----------------------------------------------------------------


FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

-----------------------------------------------------------------
 Mov  Turn        Cost    Fuel     CO2      CO       HC       NOX
 ID               Rate    Eff.     Rate     Rate     Rate     Rate
                  $/mi    mpg      g/km     g/km     g/km     g/km
-----------------------------------------------------------------
```

```
East: Greenbag Road (CR 857)
    6  T1           0.29   17.7   315.2    0.38   0.029   0.492
   16  R2           0.25   29.9   185.0    0.25   0.017   0.064
                 ----------------------------------------------
                   0.28   19.7   281.7    0.35   0.026   0.382
--------------------------------------------------------------
North: Mississippi Avenue
    7  L2           0.32   28.8   192.1    0.12   0.016   0.098
   14  R2           0.32   20.5   270.3    0.19   0.022   0.205
                 ----------------------------------------------
                   0.32   23.0   241.0    0.16   0.020   0.165
--------------------------------------------------------------
West: Greenbag Road (CR 857)
    5  L2           0.26   38.3   144.7    0.19   0.014   0.084
    2  T1           0.23   42.1   131.5    0.18   0.012   0.072
                 ----------------------------------------------
                   0.24   41.2   134.5    0.19   0.013   0.075
--------------------------------------------------------------
 INTERSECTION:     0.26   27.4   202.6    0.25   0.019   0.205
--------------------------------------------------------------
```

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Lanes

Lane Performance and Capacity Information
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE PERFORMANCE

---------------------------------------------------------------
                                          Q u e u e
          Flow   Cap   Deg.  Aver.  Eff.   95% Back     Lane
 Lane                  Satn  Delay  Stop  ------------  Length
 No.      veh/h veh/h    x    sec   Rate    veh     ft     ft
---------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1         539  1155  0.466    8.1  0.34    2.8   70.5  1600.0
 2         191  1178  0.162    4.5  0.22    0.7   17.7   350.0T
---------------------------------------------------------------
 North: Mississippi Avenue
 1         158   783  0.202    6.8  0.55    0.9   21.9  1600.0
---------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1         203  1332  0.153    4.0  0.07    0.7   17.0   225.0T
 2         720  1332  0.541    8.5  0.13    4.2  104.9  1600.0
---------------------------------------------------------------
  T  Short lane due to specification of Turn Bay


LANE FLOW AND CAPACITY INFORMATION

----------------------------------------
 Lane   Total     Min   Tot   Deg.  Lane
 No.    Arv Flow  Cap   Cap   Satn  Util
         veh/h   veh/h veh/h    x     %
----------------------------------------
 East: Greenbag Road (CR 857)
 1        539     150  1155   0.466  100
 2        191     150  1178   0.162  100
----------------------------------------
 North: Mississippi Avenue
 1        158     150   783   0.202  100
----------------------------------------
 West: Greenbag Road (CR 857)
 1        203     150  1332   0.153  100
 2        720     150  1332   0.541  100
----------------------------------------

  The capacity values of Continuous Lanes are obtained by adjusting the basic
  saturation flow for lane width, grade, movement class and turning vehicle effects.
  Saturation flow scale applies if specified.
```

Go to Table Links (Top)

Lane, Approach and Intersection Performance
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

------------------------------------------------------------
 Lane   Arrival        Adj.    Deg   Aver.   Longest   Lane
 No.    Flow     %HV   Basic   Sat   Delay   Queue     Length
        (veh/h)       Satf.    x     sec       ft       ft
------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1        539      2          0.466    8.1     71      1600
 2        191      0          0.162    4.5     18       350
         ----------------------------------------------------
          730      1          0.466    7.2     71
------------------------------------------------------------
 North: Mississippi Avenue
 1        158      1          0.202    6.8     22      1600
```

```
        ----------------------------------------------------
          158      1          0.202    6.8     22
-------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1        203      1          0.153    4.0     17      225
 2        720      1          0.541    8.5    105     1600
        ----------------------------------------------------
          924      1          0.541    7.5    105
=============================================================
 ALL VEHICLES
         Total     %           Max   Aver.    Max
         Flow     HV            X    Delay   Queue
         1812      1          0.541    7.3    105
=============================================================
Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled
      intersections apply only to continuous lanes.
```

Go to Table Links (Top)

Driver Characteristics
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout

-----------------------------------------------------------
                                          Average  Driver
 Lane    Satn     Satn     Satn     Satn     Queue  Response
 No.     Speed    Flow     Hdwy   Spacing    Space    Time
          mph     veh/h    sec      ft        ft      sec
-----------------------------------------------------------
 East: Greenbag Road (CR 857)
 1       25.7    1420     2.54    95.59    25.40    1.86
 2      NA - Short Lane
-----------------------------------------------------------
 North: Mississippi Avenue
 1       19.3    1380     2.61    73.84    25.13    1.72
-----------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      NA - Short Lane
 2       23.7    1420     2.54    88.12    25.20    1.81
-----------------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

Go to Table Links (Top)

Lane Delays
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                            ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green            dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 East: Greenbag Road (CR 857)
 1      0.466    NA      NA     3.1   5.4   2.7   8.1   6.8   4.9   0.0   4.9   0.0    8.1
 2      0.162    NA      NA     3.1   3.9   0.6   4.5   4.8   2.8   0.0   2.8   0.0    4.5
-------------------------------------------------------------------------------------------------
 North: Mississippi Avenue
 1      0.202    NA      NA     4.6   5.6   1.2   6.8   4.3   4.3   0.0   4.3   0.0    6.8
-------------------------------------------------------------------------------------------------
 West: Greenbag Road (CR 857)
 1      0.153    NA      NA     2.7   3.5   0.5   4.0   5.0   3.1   0.0   3.1   0.0    4.0
 2      0.541    NA      NA     2.7   5.4   3.1   8.5   6.5   6.6   0.0   6.6   0.0    8.5
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

Go to Table Links (Top)

Lane Queues
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


BACK OF QUEUE (VEHICLES)
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (veh) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.0	1.1	0.0	1.1	2.8	0.02	0.04	0.0	NA
2	0.162	NA	NA	0.0	0.3	0.0	0.3	0.7	0.02	0.05	NA	0.0
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	0.4	0.0	0.4	0.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	0.3	0.0	0.3	0.7	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	1.7	0.0	1.7	4.2	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.0	28.4	0.0	28.4	70.5	0.02	0.04	0.0	NA
2	0.162	NA	NA	0.0	7.1	0.0	7.1	17.7	0.02	0.05	NA	0.0
North: Mississippi Avenue												
1	0.202	NA	NA	0.0	8.8	0.0	8.8	21.9	0.01	0.01	0.0	NA
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.0	6.8	0.0	6.8	17.0	0.03	0.08	NA	0.0
2	0.541	NA	NA	0.0	42.2	0.0	42.2	104.9	0.03	0.07	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.466	NA	NA	0.0	1.2	2.2
2	0.162	NA	NA	0.0	0.2	0.4
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	0.3	0.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	0.2	0.4
2	0.541	NA	NA	0.0	1.7	3.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
East: Greenbag Road (CR 857)						
1	0.466	NA	NA	0.0	31.0	56.2
2	0.162	NA	NA	0.0	5.9	10.8
North: Mississippi Avenue						
1	0.202	NA	NA	0.0	7.5	13.5
West: Greenbag Road (CR 857)						
1	0.153	NA	NA	0.0	5.6	10.2
2	0.541	NA	NA	0.0	43.1	78.1

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

Go to Table Links (Top)

Lane Queue Percentiles
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.466	1.1	1.4	2.0	2.4	2.8	3.1	3.3
2	0.162	0.3	0.4	0.5	0.6	0.7	0.8	0.8
North: Mississippi Avenue								
1	0.202	0.4	0.5	0.6	0.7	0.9	1.0	1.0
West: Greenbag Road (CR 857)								
1	0.153	0.3	0.4	0.5	0.6	0.7	0.7	0.8
2	0.541	1.7	2.2	3.1	3.5	4.2	4.6	5.0

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
East: Greenbag Road (CR 857)								
1	0.466	28.4	36.7	51.8	60.0	70.5	78.3	84.2
2	0.162	7.1	9.2	13.0	15.0	17.7	19.6	21.1
North: Mississippi Avenue								
1	0.202	8.8	11.4	16.1	18.7	21.9	24.3	26.2
West: Greenbag Road (CR 857)								
1	0.153	6.8	8.9	12.5	14.5	17.0	18.9	20.3
2	0.541	42.2	54.6	77.0	89.2	104.9	116.4	125.1

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

Go to Table Links (Top)

Lane Stops
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
East: Greenbag Road (CR 857)												
1	0.466	NA	NA	0.34	0.00	0.00	0.34	183.8	0.00	0.0	0.48	0.48
2	0.162	NA	NA	0.22	0.00	0.00	0.22	42.2	0.00	0.0	0.34	0.34
North: Mississippi Avenue												
1	0.202	NA	NA	0.55	0.00	0.00	0.55	87.6	0.00	0.0	0.59	0.59
West: Greenbag Road (CR 857)												
1	0.153	NA	NA	0.07	0.00	0.00	0.07	13.8	0.00	0.0	0.17	0.17
2	0.541	NA	NA	0.13	0.00	0.00	0.13	96.7	0.00	0.0	0.30	0.30

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

Go to Table Links (Top)

Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag & Mississippi - PM Peak - Modified 2

Site ID: 857-Miss
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From EAST To:	W	N	
Turn:	T1	R2	TOT
Flow Rate	538.7	191.4	730.1
%HV (all designations)	2.0	0.0	1.5
From NORTH To:	**E**	**W**	
Turn:	L2	R2	TOT
Flow Rate	59.1	98.9	158.1
%HV (all designations)	0.0	1.0	0.6
From WEST To:	**N**	**E**	
Turn:	L2	T1	TOT
Flow Rate	203.2	720.4	923.7

```
 %HV (all designations)        1.0     1.0     1.0
-------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


FLOW RATES for Light Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate           527.9   191.4   719.3
 Mov Class %          98.0   100.0    98.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate            59.1    97.9   157.1
 Mov Class %         100.0    99.0    99.4
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate           201.2   713.2   914.4
 Mov Class %          99.0    99.0    99.0
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

FLOW RATES for Heavy Vehicles (veh/h)

-------------------------------------------
 From EAST To:          W       N
 Turn:                  T1      R2     TOT
-------------------------------------------
 Flow Rate            10.8     0.0    10.8
 Mov Class %           2.0     0.0     1.5
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From NORTH To:         E       W
 Turn:                  L2      R2     TOT
-------------------------------------------
 Flow Rate             0.0     1.0     1.0
 Mov Class %           0.0     1.0     0.6
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------
 From WEST To:          N       E
 Turn:                  L2      T1     TOT
-------------------------------------------
 Flow Rate             2.0     7.2     9.2
 Mov Class %           1.0     1.0     1.0
 Flow Scale           1.00    1.00       -
 Peak Flow Factor     0.93    0.93       -
 Residual Demand       0.0     0.0     0.0
-------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-----------------------------------------
```

```
 From EAST To:        W       N
 Turn:                T1      R2     TOT
----------------------------------------
 Lane  1
   LV              527.9       *   527.9
   HV               10.8       *    10.8
   Total           538.7       *   538.7
 Lane  2
   LV                 *   191.4   191.4
   Total              *   191.4   191.4
----------------------------------------
 Approach          538.7   191.4   730.1
----------------------------------------
 From NORTH To:       E       W
 Turn:                L2      R2     TOT
----------------------------------------
 Lane  1
   LV               59.1    97.9   157.1
   HV                  *     1.0     1.0
   Total            59.1    98.9   158.1
----------------------------------------
 Approach           59.1    98.9   158.1
----------------------------------------
 From WEST To:        N       E
 Turn:                L2      T1     TOT
----------------------------------------
 Lane  1
   LV              201.2       *   201.2
   HV                2.0       *     2.0
   Total           203.2       *   203.2
 Lane  2
   LV                 *   713.2   713.2
   HV                 *     7.2     7.2
   Total              *   720.4   720.4
----------------------------------------
 Approach          203.2   720.4   923.7
----------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

----------------------------------------
Movement Class:       LV      HV     TOT
----------------------------------------
 Exit: EAST
Lane:  1           772.4     7.2   779.6
Total              772.4     7.2   779.6
----------------------------------------
 Exit: NORTH
Lane:  1           392.6     2.0   394.6
Total              392.6     2.0   394.6
----------------------------------------
 Exit: WEST
Lane:  1           625.9    11.8   637.6
Total              625.9    11.8   637.6
----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
```

```
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag & Mississippi - PM Peak - Modified 2

```
Site ID: 857-Miss
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

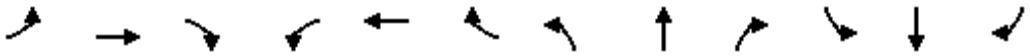
Go to Table Links (Top)

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Thursday, April 11, 2019 10:17:57 AM
Project: C:\Users\msouthern\Desktop\Projects\18-141 WVDOH Greenbag Road PIE Study\06 Traffic\B - Analyses\2019-04-11 Updated Mississippi\Greenbag & Mississippi Roundabout HCM 6th Ed - Single Lane.sip8

ENCLOSURE

- Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) Capacity and Queue Analyses
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Traffic Signal Improvement – With Left Turn and Right Turn Lanes on All Approaches
    - 2048 Design Year Conditions with Proposed Roundabout Improvement – With Eastbound Left Turn Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.930			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1628	0	1678	1728	0	1788	1750	0	1684	1411	0
Flt Permitted	0.160			0.350			0.421			0.258		
Satd. Flow (perm)	264	1628	0	618	1728	0	792	1750	0	457	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			2			45			168	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	438	0	34	538	0	208	410	0	92	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

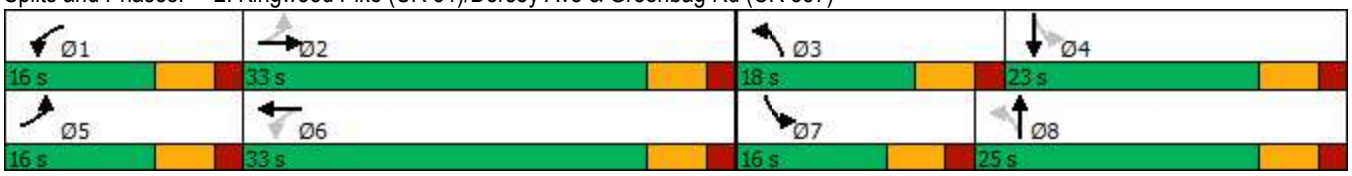


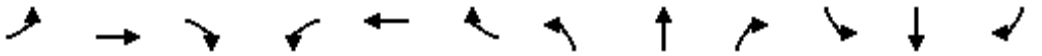
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	16.0	24.0		16.0	24.0		16.0	16.0		16.0	16.0	
Total Split (s)	16.0	33.0		16.0	33.0		18.0	25.0		16.0	23.0	
Total Split (%)	17.8%	36.7%		17.8%	36.7%		20.0%	27.8%		17.8%	25.6%	
Maximum Green (s)	10.0	27.0		10.0	27.0		12.0	19.0		10.0	17.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	36.2	31.3		32.8	27.7		28.2	19.5		22.3	13.9	
Actuated g/C Ratio	0.44	0.38		0.40	0.34		0.35	0.24		0.27	0.17	
v/c Ratio	0.31	0.70		0.10	0.91		0.51	0.91		0.37	0.52	
Control Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.6	31.8		13.7	52.2		23.5	56.2		22.4	13.3	
LOS	B	C		B	D		C	E		C	B	
Approach Delay		29.5			49.9			45.2			16.2	
Approach LOS		C			D			D			B	
Queue Length 50th (ft)	22	215		10	291		77	202		32	13	
Queue Length 95th (ft)	47	#387		26	#531		134	#408		66	74	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	282	627		399	588		426	452		289	433	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.27	0.70		0.09	0.91		0.49	0.91		0.32	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 81.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 38.3 Intersection LOS: D
Intersection Capacity Utilization 76.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

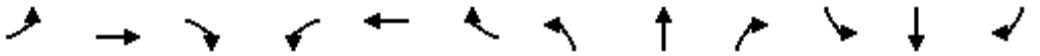




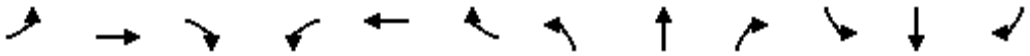
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1569	1584	1584	1904	1874	1874	2160	2160	2160	1611	1611	1611
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	7	5	7	7	1	1	1	0	0	0
Cap, veh/h	211	486	46	241	576	23	399	247	218	226	38	228
Arrive On Green	0.05	0.34	0.34	0.03	0.32	0.32	0.11	0.23	0.23	0.06	0.19	0.19
Sat Flow, veh/h	1495	1425	135	1813	1788	73	2057	1059	933	1535	199	1197
Grp Volume(v), veh/h	75	0	438	34	0	538	208	0	410	92	0	196
Grp Sat Flow(s),veh/h/ln	1495	0	1560	1813	0	1861	2057	0	1992	1535	0	1396
Q Serve(g_s), s	2.4	0.0	18.9	0.9	0.0	20.2	5.8	0.0	14.6	3.5	0.0	9.7
Cycle Q Clear(g_c), s	2.4	0.0	18.9	0.9	0.0	20.2	5.8	0.0	14.6	3.5	0.0	9.7
Prop In Lane	1.00		0.09	1.00		0.04	1.00		0.47	1.00		0.86
Lane Grp Cap(c), veh/h	211	0	532	241	0	599	399	0	465	226	0	266
V/C Ratio(X)	0.35	0.00	0.82	0.14	0.00	0.90	0.52	0.00	0.88	0.41	0.00	0.74
Avail Cap(c_a), veh/h	335	0	574	426	0	684	514	0	516	337	0	323
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	22.1	17.7	0.0	23.7	20.9	0.0	27.1	22.7	0.0	28.0
Incr Delay (d2), s/veh	1.0	0.0	8.9	0.3	0.0	13.6	1.1	0.0	15.2	1.2	0.0	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	7.5	0.4	0.0	10.2	2.6	0.0	8.2	1.3	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	0.0	31.0	17.9	0.0	37.3	22.0	0.0	42.3	23.9	0.0	34.9
LnGrp LOS	B	A	C	B	A	D	C	A	D	C	A	C
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		29.3			36.2			35.5			31.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	31.1	13.9	20.0	9.9	29.6	10.7	23.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	27.0	12.0	17.0	10.0	27.0	10.0	19.0
Max Q Clear Time (g_c+I1), s	2.9	20.9	7.8	11.7	4.4	22.2	5.5	16.6
Green Ext Time (p_c), s	0.0	1.3	0.2	0.5	0.1	1.4	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	33.5
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	200		0	150		0	150		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.990			0.931			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1709	0	1762	1820	0	1736	1726	0	1667	1651	0
Flt Permitted	0.258			0.091			0.198			0.480		
Satd. Flow (perm)	460	1709	0	169	1820	0	362	1726	0	842	1651	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			4			33			27	
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	750	0	131	505	0	79	163	0	149	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

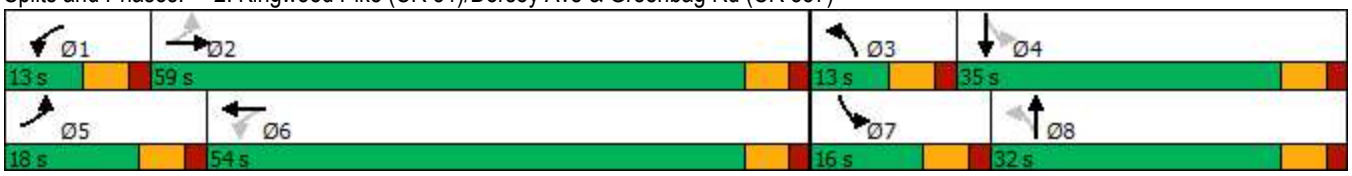


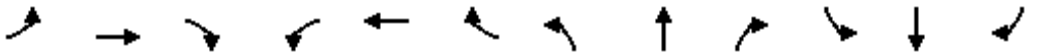
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	13.0	24.0		13.0	24.0		13.0	13.0		13.0	13.0	
Total Split (s)	18.0	59.0		13.0	54.0		13.0	32.0		16.0	35.0	
Total Split (%)	15.0%	49.2%		10.8%	45.0%		10.8%	26.7%		13.3%	29.2%	
Maximum Green (s)	12.0	53.0		7.0	48.0		7.0	26.0		10.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effct Green (s)	62.4	51.9		55.6	48.6		29.3	22.5		36.0	28.3	
Actuated g/C Ratio	0.54	0.45		0.48	0.42		0.25	0.19		0.31	0.25	
v/c Ratio	0.46	0.97		0.74	0.66		0.46	0.45		0.45	0.94	
Control Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.4	56.7		44.9	32.9		35.9	36.4		33.1	72.9	
LOS	B	E		D	C		D	D		C	E	
Approach Delay		49.6			35.4			36.3			62.1	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	61	554		47	314		41	86		82	289	
Queue Length 95th (ft)	97	#811		#143	438		77	151		134	#479	
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	200			150			150			125		
Base Capacity (vph)	384	799		178	774		176	417		334	438	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.94		0.74	0.65		0.45	0.39		0.45	0.91	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 115.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 47.3 Intersection LOS: D
Intersection Capacity Utilization 87.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

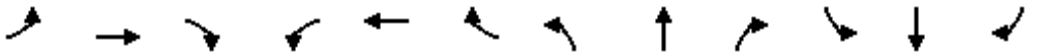




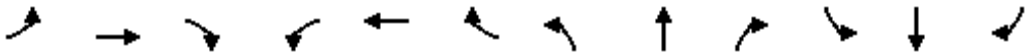
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1688	1673	1673	1979	1964	1964	2115	2130	2130	1597	1611	1611
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	1	0	1	1	4	3	3	1	0	0
Cap, veh/h	367	564	160	164	781	56	150	218	186	330	220	150
Arrive On Green	0.07	0.45	0.45	0.05	0.43	0.43	0.04	0.21	0.21	0.09	0.25	0.25
Sat Flow, veh/h	1608	1253	356	1884	1810	131	2015	1062	905	1521	894	608
Grp Volume(v), veh/h	164	0	750	131	0	505	79	0	163	149	0	400
Grp Sat Flow(s),veh/h/ln	1608	0	1609	1884	0	1940	2015	0	1967	1521	0	1502
Q Serve(g_s), s	6.6	0.0	53.0	4.5	0.0	23.5	3.6	0.0	8.4	9.0	0.0	29.0
Cycle Q Clear(g_c), s	6.6	0.0	53.0	4.5	0.0	23.5	3.6	0.0	8.4	9.0	0.0	29.0
Prop In Lane	1.00		0.22	1.00		0.07	1.00		0.46	1.00		0.41
Lane Grp Cap(c), veh/h	367	0	725	164	0	837	150	0	405	330	0	370
V/C Ratio(X)	0.45	0.00	1.03	0.80	0.00	0.60	0.53	0.00	0.40	0.45	0.00	1.08
Avail Cap(c_a), veh/h	412	0	725	173	0	837	181	0	435	330	0	370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	32.3	27.6	0.0	25.7	36.9	0.0	40.5	32.6	0.0	44.3
Incr Delay (d2), s/veh	0.9	0.0	42.6	21.5	0.0	1.2	2.8	0.0	0.6	1.0	0.0	69.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	27.9	2.9	0.0	10.7	1.8	0.0	4.0	3.4	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	75.0	49.1	0.0	26.9	39.8	0.0	41.1	33.6	0.0	114.3
LnGrp LOS	B	A	F	D	A	C	D	A	D	C	A	F
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		65.1			31.5			40.7			92.4	
Approach LOS		E			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	59.0	11.2	35.0	14.7	56.7	16.0	30.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	53.0	7.0	29.0	12.0	48.0	10.0	26.0
Max Q Clear Time (g_c+I1), s	6.5	55.0	5.6	31.0	8.6	25.5	11.0	10.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	3.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	59.8
HCM 6th LOS	E



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (vph)	69	368	35	31	476	19	191	201	177	85	26	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	250		250	200		325	250		250	350		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1567	1665	1273	1678	1734	1577	1788	1882	1600	1684	1772	1357
Flt Permitted	0.187			0.378			0.381			0.889		
Satd. Flow (perm)	308	1665	1273	668	1734	1577	717	1882	1600	1576	1772	1357
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109			192			168
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	7%	19%	5%	7%	0%	1%	1%	1%	0%	0%	11%
Adj. Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	400	38	34	517	21	208	218	192	92	28	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

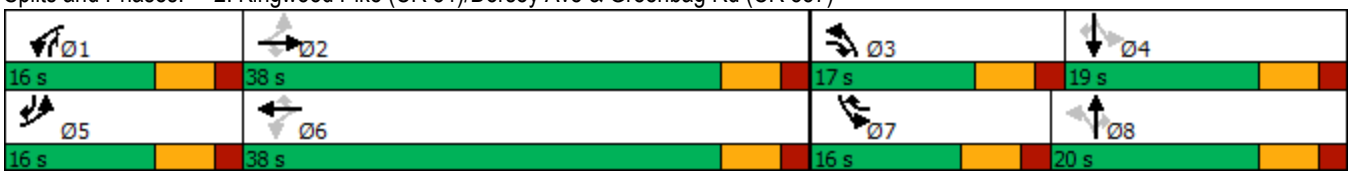


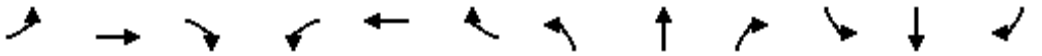
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	16.0	24.0	16.0	16.0	24.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	16.0	38.0	17.0	16.0	38.0	16.0	17.0	20.0	16.0	16.0	19.0	16.0
Total Split (%)	17.8%	42.2%	18.9%	17.8%	42.2%	17.8%	18.9%	22.2%	17.8%	17.8%	21.1%	17.8%
Maximum Green (s)	10.0	32.0	11.0	10.0	32.0	10.0	11.0	14.0	10.0	10.0	13.0	10.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	None	None	Min	None	None	None	None	None	None	None
Act Effct Green (s)	36.3	28.4	52.2	33.7	27.0	42.3	22.4	12.8	25.8	13.4	8.8	14.6
Actuated g/C Ratio	0.46	0.36	0.67	0.43	0.35	0.54	0.29	0.16	0.33	0.17	0.11	0.19
v/c Ratio	0.28	0.66	0.04	0.09	0.86	0.02	0.47	0.71	0.29	0.33	0.14	0.43
Control Delay	13.3	28.1	0.1	11.1	41.5	0.1	26.0	48.3	5.1	29.3	36.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	28.1	0.1	11.1	41.5	0.1	26.0	48.3	5.1	29.3	36.0	7.6
LOS	B	C	A	B	D	A	C	D	A	C	D	A
Approach Delay		23.8			38.2			27.4			17.3	
Approach LOS		C			D			C			B	
Queue Length 50th (ft)	20	177	0	9	256	0	84	115	0	48	15	0
Queue Length 95th (ft)	41	281	0	23	#442	0	147	#225	46	72	39	44
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	250		250	200		325	250		250	350		275
Base Capacity (vph)	323	741	898	458	751	934	463	357	727	319	312	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.54	0.04	0.07	0.69	0.02	0.45	0.61	0.26	0.29	0.09	0.39

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 78.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.1 Intersection LOS: C
Intersection Capacity Utilization 64.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)

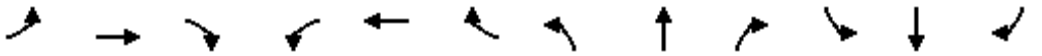




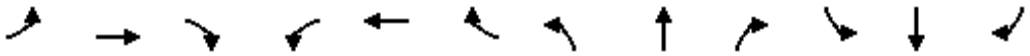
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Future Volume (veh/h)	69	368	35	31	476	19	191	201	177	85	26	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1569	1584	1406	1904	1874	1979	2160	2160	2160	1611	1611	1448
Adj Flow Rate, veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	8	7	19	5	7	0	1	1	1	0	0	11
Cap, veh/h	237	547	545	288	607	654	530	437	434	302	252	260
Arrive On Green	0.06	0.34	0.34	0.03	0.32	0.32	0.11	0.20	0.20	0.07	0.16	0.16
Sat Flow, veh/h	1495	1584	1192	1813	1874	1677	2057	2160	1831	1535	1611	1227
Grp Volume(v), veh/h	75	400	38	34	517	21	208	218	192	92	28	168
Grp Sat Flow(s),veh/h/ln	1495	1584	1192	1813	1874	1677	2057	2160	1831	1535	1611	1227
Q Serve(g_s), s	2.2	15.1	1.2	0.8	17.6	0.5	5.6	6.1	6.1	3.4	1.0	8.5
Cycle Q Clear(g_c), s	2.2	15.1	1.2	0.8	17.6	0.5	5.6	6.1	6.1	3.4	1.0	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	547	545	288	607	654	530	437	434	302	252	260
V/C Ratio(X)	0.32	0.73	0.07	0.12	0.85	0.03	0.39	0.50	0.44	0.30	0.11	0.65
Avail Cap(c_a), veh/h	373	743	692	491	879	897	631	443	439	425	307	302
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.3	19.6	10.4	15.7	21.5	12.8	20.3	24.1	22.2	22.0	24.7	24.5
Incr Delay (d2), s/veh	0.8	2.4	0.1	0.2	5.5	0.0	0.5	0.9	0.7	0.6	0.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.2	0.3	0.3	7.7	0.2	2.4	2.9	2.4	1.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	22.0	10.4	15.9	27.1	12.9	20.8	25.0	22.9	22.6	24.9	28.3
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	C	C
Approach Vol, veh/h		513			572			618			288	
Approach Delay, s/veh		20.4			25.9			22.9			26.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.4	29.5	13.6	16.7	9.8	28.1	10.5	19.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	32.0	11.0	13.0	10.0	32.0	10.0	14.0
Max Q Clear Time (g_c+I1), s	2.8	17.1	7.6	10.5	4.2	19.6	5.4	8.1
Green Ext Time (p_c), s	0.0	2.1	0.2	0.2	0.1	2.5	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (vph)	146	520	148	117	419	30	70	78	67	133	212	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		6%			-2%			-7%			7%	
Storage Length (ft)	250		250	200		325	250		250	350		275
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1692	1764	1514	1762	1837	1577	1736	1846	1584	1667	1772	1477
Flt Permitted	0.285			0.163			0.442			0.696		
Satd. Flow (perm)	508	1764	1514	302	1837	1577	808	1846	1584	1221	1772	1477
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			166			109			109			162
Link Speed (mph)		40			40			45			35	
Link Distance (ft)		1682			1223			1203			1288	
Travel Time (s)		28.7			20.8			18.2			25.1	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	4%	3%	2%	1%	0%	2%
Adj. Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	584	166	131	471	34	79	88	75	149	238	162
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		75			55			60			65	
Two way Left Turn Lane		Yes										
Headway Factor	1.09	1.09	1.09	1.03	1.03	1.03	1.00	1.00	1.00	1.09	1.09	1.09
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

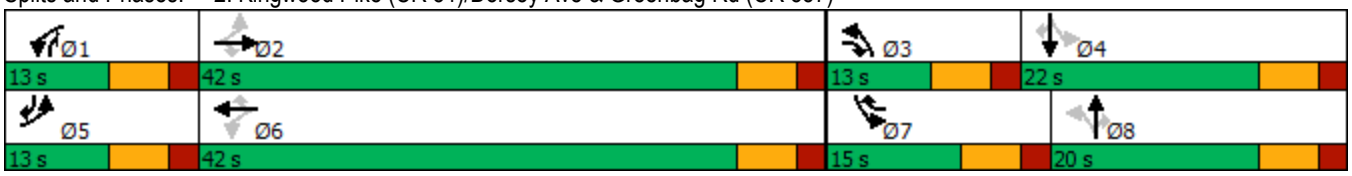


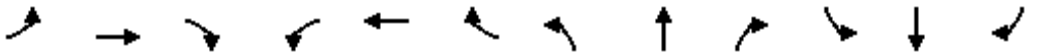
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	13.0	24.0	13.0	13.0	24.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	13.0	42.0	13.0	13.0	42.0	15.0	13.0	20.0	13.0	15.0	22.0	13.0
Total Split (%)	14.4%	46.7%	14.4%	14.4%	46.7%	16.7%	14.4%	22.2%	14.4%	16.7%	24.4%	14.4%
Maximum Green (s)	7.0	36.0	7.0	7.0	36.0	9.0	7.0	14.0	7.0	9.0	16.0	7.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min	None	None	Min	None	None	None	None	None	None	None
Act Effct Green (s)	38.2	31.2	44.0	37.9	31.0	45.7	21.2	15.9	28.8	23.0	14.5	27.6
Actuated g/C Ratio	0.46	0.37	0.53	0.45	0.37	0.55	0.25	0.19	0.34	0.28	0.17	0.33
v/c Ratio	0.50	0.89	0.19	0.51	0.69	0.04	0.28	0.25	0.12	0.39	0.78	0.27
Control Delay	16.3	42.0	2.3	17.9	28.3	0.1	24.7	35.7	2.6	25.8	53.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	42.0	2.3	17.9	28.3	0.1	24.7	35.7	2.6	25.8	53.0	5.2
LOS	B	D	A	B	C	A	C	D	A	C	D	A
Approach Delay		30.2			24.6			21.8			31.5	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	44	291	0	34	211	0	31	45	0	62	129	0
Queue Length 95th (ft)	76	#466	26	62	312	0	64	89	15	110	#236	41
Internal Link Dist (ft)		1602			1143			1123			1208	
Turn Bay Length (ft)	250		250	200		325	250		250	350		275
Base Capacity (vph)	332	769	881	261	801	920	283	357	620	392	343	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.76	0.19	0.50	0.59	0.04	0.28	0.25	0.12	0.38	0.69	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 83.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Kingwood Pike (CR 81)/Dorsey Ave & Greenbag Rd (CR 857)





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Future Volume (veh/h)	146	520	148	117	419	30	70	78	67	133	212	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1688	1673	1688	1979	1964	1979	2115	2130	2145	1597	1611	1582
Adj Flow Rate, veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	1	0	0	1	0	4	3	2	1	0	2
Cap, veh/h	370	653	635	264	726	797	240	265	344	345	284	351
Arrive On Green	0.09	0.39	0.39	0.06	0.37	0.37	0.05	0.12	0.12	0.11	0.18	0.18
Sat Flow, veh/h	1608	1673	1430	1884	1964	1677	2015	2130	1818	1521	1611	1340
Grp Volume(v), veh/h	164	584	166	131	471	34	79	88	75	149	238	162
Grp Sat Flow(s),veh/h/ln	1608	1673	1430	1884	1964	1677	2015	2130	1818	1521	1611	1340
Q Serve(g_s), s	4.7	24.9	5.6	3.2	15.2	0.8	2.6	2.9	2.7	6.4	10.9	7.7
Cycle Q Clear(g_c), s	4.7	24.9	5.6	3.2	15.2	0.8	2.6	2.9	2.7	6.4	10.9	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	653	635	264	726	797	240	265	344	345	284	351
V/C Ratio(X)	0.44	0.89	0.26	0.50	0.65	0.04	0.33	0.33	0.22	0.43	0.84	0.46
Avail Cap(c_a), veh/h	380	791	752	315	928	969	317	391	452	365	338	396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.5	21.8	13.3	17.4	19.9	10.7	27.2	30.5	26.1	25.1	30.3	23.6
Incr Delay (d2), s/veh	0.8	11.1	0.2	1.4	1.0	0.0	0.8	0.7	0.3	0.9	14.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	10.6	1.6	1.3	6.4	0.3	1.2	1.4	1.1	2.3	5.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	32.9	13.6	18.9	21.0	10.7	27.9	31.2	26.4	26.0	44.8	24.5
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	D	C
Approach Vol, veh/h		914			636			242			549	
Approach Delay, s/veh		26.2			20.0			28.7			33.7	
Approach LOS		C			B			C			C	

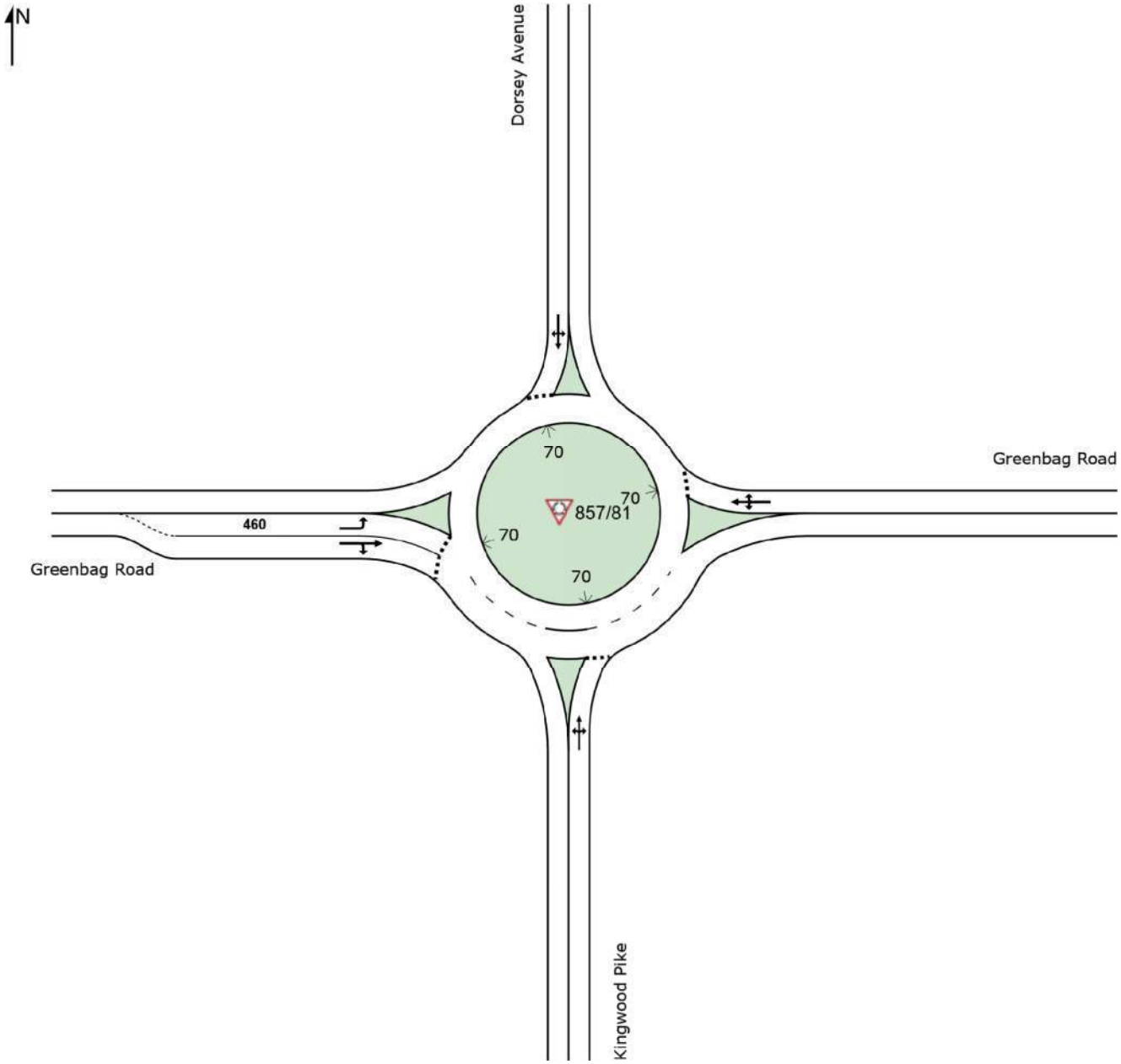
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	35.7	10.1	19.5	12.5	34.2	14.0	15.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	36.0	7.0	16.0	7.0	36.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	5.2	26.9	4.6	12.9	6.7	17.2	8.4	4.9
Green Ext Time (p_c), s	0.0	2.8	0.0	0.6	0.0	2.7	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C

SITE LAYOUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout



MOVEMENT SUMMARY

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	208	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.9
8	T1	218	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	28.0
18	R2	192	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.4
Approach		618	1.0	0.733	18.7	LOS B	8.7	220.0	0.84	1.16	1.74	27.8
East: Greenbag Road												
1	L2	34	5.0	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.7
6	T1	517	7.0	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.8
16	R2	21	0.0	0.744	20.4	LOS C	9.5	251.3	0.86	1.22	1.80	27.2
Approach		572	6.6	0.744	20.7	LOS C	9.5	251.3	0.86	1.22	1.80	27.8
North: Dorsey Avenue												
7	L2	92	0.0	0.503	14.6	LOS B	2.9	76.5	0.76	0.89	1.16	29.5
4	T1	28	0.0	0.503	14.6	LOS B	2.9	76.5	0.76	0.89	1.16	29.6
14	R2	168	11.0	0.503	15.2	LOS B	2.9	76.5	0.76	0.89	1.16	28.9
Approach		289	6.4	0.503	15.0	LOS B	2.9	76.5	0.76	0.89	1.16	29.1
West: Greenbag Road												
5	L2	75	8.0	0.066	3.7	LOS A	0.2	6.5	0.27	0.14	0.27	32.8
2	T1	400	7.0	0.383	7.0	LOS A	1.9	51.7	0.37	0.23	0.37	33.4
12	R2	38	15.0	0.383	7.2	LOS A	1.9	51.7	0.37	0.23	0.37	32.3
Approach		513	7.7	0.383	6.5	LOS A	1.9	51.7	0.35	0.22	0.35	33.2
All Vehicles		1992	5.1	0.744	15.6	LOS B	9.5	251.3	0.71	0.89	1.32	29.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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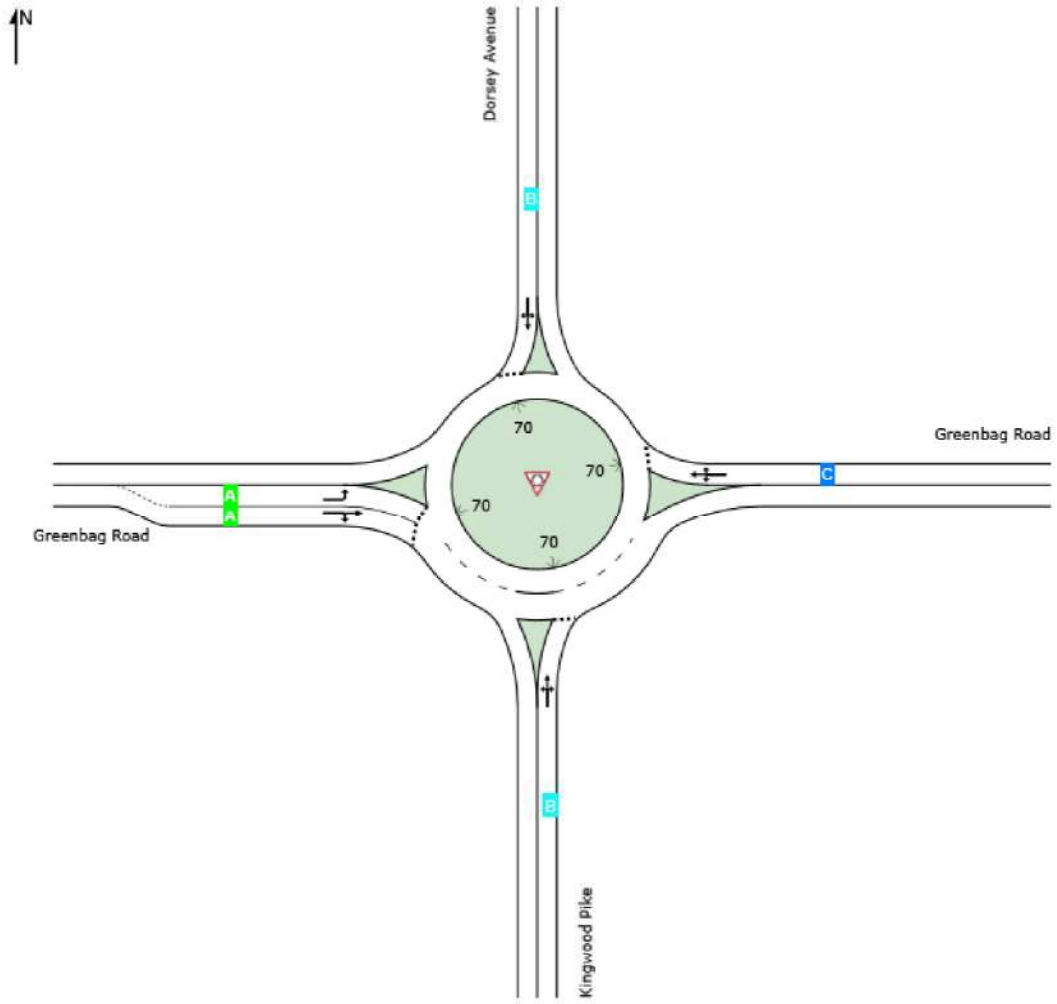
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	C	B	A	B



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

QUEUE DISTANCE (%ILE)

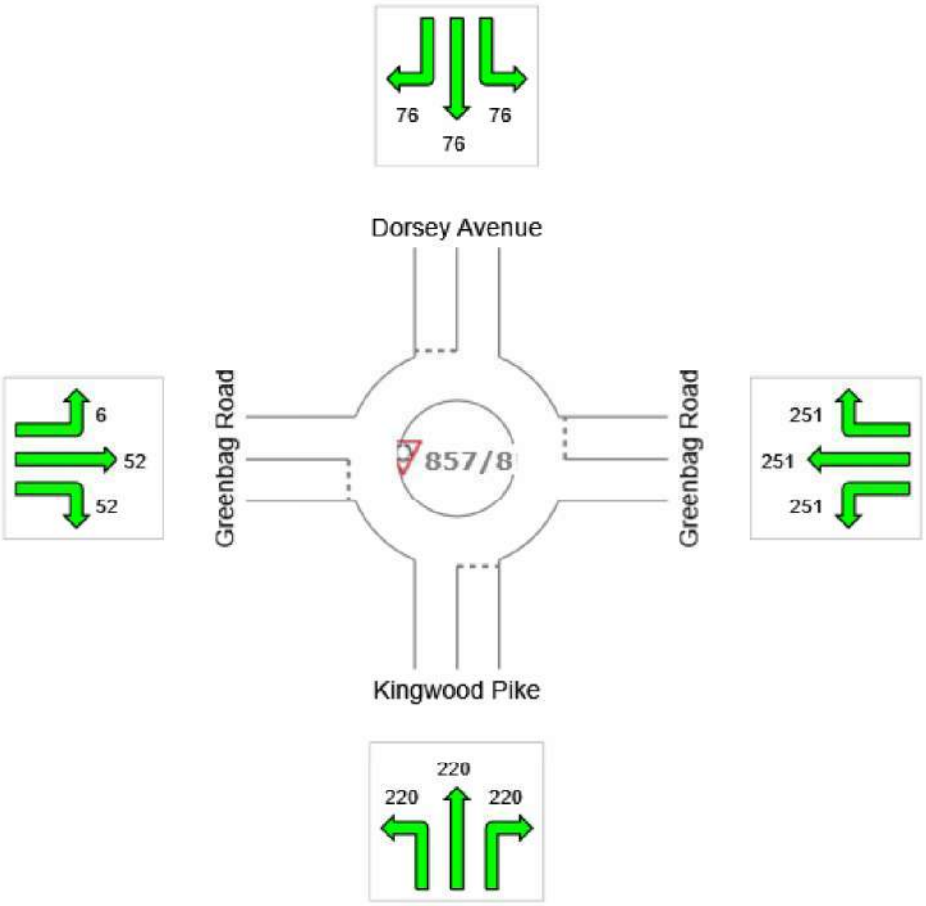
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	220	251	76	52	251



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: AM Peak
Roundabout

OUTPUT TABLE LINKS

- Roundabouts
  - Roundabout Basic Parameters
  - Roundabout Circulating / Exiting Stream Parameters
  - Roundabout Gap Acceptance Parameters
  - Roundabout Flow Rates
- Movements
  - Intersection Negotiation and Travel Data
  - Movement Capacity and Performance Parameters
  - Fuel Consumption, Emissions and Cost
- Lanes
  - Lane Performance and Capacity Information
  - Lane, Approach and Intersection Performance
  - Driver Characteristics
  - Lane Delays
  - Lane Queues
  - Lane Queue Percentiles
  - Lane Stops
- Flow Rates
  - Origin-Destination Flow Rates (Total)
  - Origin-Destination Flow Rates by Movement Class
  - Lane Flow Rates
- Other
  - Parameter Settings Summary
  - Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0*	44.0*	142.0*	65.0*	30.0*	2	1	11.00*	1600	NA	0.0N
East: Greenbag Road										
70.0*	43.0*	141.0*	65.0*	30.0*	1	1	12.00*	1600	NA	0.0N
North: Dorsey Avenue										
70.0*	28.0*	142.0*	65.0*	30.0*	1	1	11.00*	1600	NA	0.0N
West: Greenbag Road										
70.0*	28.0*	141.0*	65.0*	30.0*	1	2	12.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
N	T1	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
E	R2	1	Dominant	567	1.06	601	0.0	0.0	N	-	19.6	0.00	0.000
East: Greenbag Road													

```
  S   L2   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
  W   T1   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
  N   R2   1 Dominant       501  1.02   511    0.0    0.0    N       -      17.2    0.00    0.000
-------------------------------------------------------------------------------------------------
North: Dorsey Avenue
  E   L2   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
  S   T1   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
  W   R2   1 Dominant       759  1.05   799    0.0    0.0    N       -      19.5    0.00    0.000
-------------------------------------------------------------------------------------------------
West: Greenbag Road
  N   L2   1 Subdominant    154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
  E   T1   2 Dominant       154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
  S   R2   2 Dominant       154  1.01   156    0.0    0.0    N       -      16.3    0.00    0.000
-------------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6
```

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout

-------------------------------------------------------------------------------------------
Dest  Turn  Lane  Lane                                          Critical Gap
             No.  Type      In-Bunch  Prop.  Priority  HVE for ------------  Follow-up
                           Headway  Bunched  Sharing   Entry   Headway   Dist   Headway
                             sec                                 sec       ft     sec
-------------------------------------------------------------------------------------------
South: Kingwood Pike
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  W    L2    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
  N    T1    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
  E    R2    1 Dominant       0.00    0.000      N       1.01     4.33   124.7     2.54
-------------------------------------------------------------------------------------------
East: Greenbag Road
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  S    L2    1 Dominant       0.00    0.000      N       1.05     4.98   125.6     2.61
  W    T1    1 Dominant       0.00    0.000      N       1.07     4.98   125.6     2.61
  N    R2    1 Dominant       0.00    0.000      N       1.00     4.98   125.6     2.61
-------------------------------------------------------------------------------------------
North: Dorsey Avenue
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  E    L2    1 Dominant       0.00    0.000      N       1.00     4.98   142.2     2.61
  S    T1    1 Dominant       0.00    0.000      N       1.00     4.98   142.2     2.61
  W    R2    1 Dominant       0.00    0.000      N       1.11     4.98   142.2     2.61
-------------------------------------------------------------------------------------------
West: Greenbag Road
Model Calibration Factor (HCM 6): 1.00
Entry/Circ. Flow Adjustment (HCM 6): None
  N    L2    1 Subdominant    0.00    0.000      N       1.08     4.54   108.7     2.54
  E    T1    2 Dominant       0.00    0.000      N       1.07     4.54   108.7     2.54
  S    R2    2 Dominant       0.00    0.000      N       1.15     4.54   108.7     2.54
-------------------------------------------------------------------------------------------
  Roundabout Capacity Model: US HCM 6

  Dist (Distance): Spacing, i.e. distance between the front ends of two
                   successive vehicles across all lanes in the circulating
                   or exiting stream
```

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


CIRCULATING LANE FLOW RATES

----------------------------------------
  Lane          Circulating Flow Rate
  No.          veh/h   pcu/h   Percent
----------------------------------------
  South: Kingwood Pike
  1              75      81     13.5%
  2             492     520     86.5%
  Total         567     601
----------------------------------------
  East: Greenbag Road
  1             501     511    100.0%
  Total         501     511
----------------------------------------
  North: Dorsey Avenue
  1             759     799    100.0%
  Total         759     799
----------------------------------------
  West: Greenbag Road
  1             154     156    100.0%
  Total         154     156
----------------------------------------
  The US HCM 6 roundabout capacity model option is in use.
  This model considers only the total circulating flow and not the flow rates
  in individual circulating lanes.  To model the effects of flow distribution
  in circulating lanes on the entry capacity results, you should use the
```

```
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  South: Kingwood Pike
  1           192      426      618
  Total       192      426      618
---------------------------------------
  East: Greenbag Road
  1            21      551      572
  Total        21      551      572
---------------------------------------
  North: Dorsey Avenue
  1           168      121      289
  Total       168      121      289
---------------------------------------
  West: Greenbag Road
  1             0       75       75
  2            38      400      438
  Total        38      475      513
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed  Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s    veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------------
South: Kingwood Pike
             West    L2       31.5    27.9    3325.7#   81.2#     130.8       130.8      4.7
            North    T1       31.5    28.0    3325.7#   81.1#     137.6       137.6      4.9
             East    R2       30.7    27.4    3325.7#   82.9#     121.2       121.2      4.4
-------------------------------------------------------------------------------------------------------
East: Greenbag Road
            South    L2       31.3    27.7    3332.3#   82.0#      21.3        21.3      0.8
             West    T1       31.4    27.8    3332.3#   81.7#     326.5       326.5     11.7
            North    R2       30.6    27.2    3332.3#   83.5#      13.0        13.0      0.5
-------------------------------------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2       33.6    29.5    3312.5#   76.5#      58.0        58.0      2.0
            South    T1       33.7    29.6    3312.5#   76.3#      17.7        17.7      0.6
             West    R2       32.8    28.9    3312.5#   78.3#     105.7       105.7      3.7
-------------------------------------------------------------------------------------------------------
West: Greenbag Road
            North    L2       34.0    32.8    3387.2#   70.5#      48.1        48.1      1.5
             East    T1       36.0    33.4    3324.9#   67.8#     251.9       251.9      7.5
            South    R2       34.7    32.3    3324.9#   70.1#      24.0        24.0      0.7
-------------------------------------------------------------------------------------------------------
 ALL VEHICLES:               32.7    29.2    3327.8#   77.7#    1255.7      1255.7     43.0
-------------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                          Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed  Dist    Dist   Dist   Dist
 Approach  Exit      Turn    ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
South: Kingwood Pike
             West    L2      47.8   14.5  187.8   1600     488     NA
            North    T1     123.9   20.8  128.6   1600     488     NA
             East    R2      84.2   17.9   55.3   1600     488     NA
-------------------------------------------------------------------------
East: Greenbag Road
            South    L2      50.9   14.8  199.8   1600     488     NA
             West    T1     141.2   21.8  131.2   1600     488     NA
            North    R2      83.8   17.9   54.9   1600     488     NA
-------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2      50.8   14.8  199.6   1600     488     NA
            South    T1     163.1   23.0  133.5   1600     488     NA
             West    R2     111.9   20.0   54.9   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road
            North    L2      47.7   14.4  187.2   1600     488     NA
```

```
            East    T1     140.0   21.7  131.0   1600     488     NA
           South    R2      97.7   19.0   54.7   1600     488     NA
-------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-----------------------------------------------------------
            App. Speeds    Exit Speeds    Queue
            -----------    -----------   Move-up   Geom
 Mov        Cruise  Negn    Negn Cruise    Speed    Delay
 ID   Turn   mph    mph     mph   mph       mph      sec
-----------------------------------------------------------
South: Kingwood Pike
    3  L2     40.0   14.5   14.5  40.0     18.2      0.0
    8  T1     40.0   20.8   20.8  40.0     18.2      0.0
   18  R2     40.0   17.9   17.9  40.0     18.2      0.0
-----------------------------------------------------------
East: Greenbag Road
    1  L2     40.0   14.8   14.8  40.0     19.7      0.0
    6  T1     40.0   21.8   21.8  40.0     19.7      0.0
   16  R2     40.0   17.9   17.9  40.0     19.7      0.0
-----------------------------------------------------------
North: Dorsey Avenue
    7  L2     40.0   14.8   14.8  40.0     16.4      0.0
    4  T1     40.0   23.0   23.0  40.0     16.4      0.0
   14  R2     40.0   20.0   20.0  40.0     16.4      0.0
-----------------------------------------------------------
West: Greenbag Road
    5  L2     40.0   14.4   14.4  40.0     23.2      0.0
    2  T1     40.0   21.7   21.7  40.0     34.2      0.0
   12  R2     40.0   19.0   19.0  40.0     34.2      0.0
-----------------------------------------------------------
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
               Flow   Flow   Flow           Satn   Cap.
               veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #     208    567    601     283   0.85     16  0.733
    8  T1  #     218    567    601     298   0.85     16  0.733
   18  R2  #     192    567    601     262   0.85     16  0.733
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #      34    501    511      45   0.85     14  0.744*
    6  T1  #     517    501    511     695   0.85     14  0.744*
   16  R2  #      21    501    511      28   0.85     14  0.744*
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #      92    759    799     184   0.85     69  0.503
    4  T1  #      28    759    799      56   0.85     69  0.503
   14  R2  #     168    759    799     335   0.85     69  0.503
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #      75    154    156    1141   0.85   1193  0.066
    2  T1  #     400    154    156    1045   0.85    122  0.383
   12  R2  #      38    154    156      99   0.85    122  0.383
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   1.08    1.30    18.7   1.16   240.6 12.71    130.8     4.7     27.9
    8  T1   1.14    1.36    18.7   1.16   253.2 13.01    137.6     4.9     28.0
   18  R2   1.00    1.20    18.7   1.16   222.9 12.29    121.2     4.4     27.4
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.19    0.23    20.7   1.22    41.0  8.64     21.3     0.8     27.7
    6  T1   2.98    3.58    20.7   1.22   629.4 22.32    326.5    11.7     27.8
   16  R2   0.12    0.14    20.4   1.22    25.1  4.42     13.0     0.5     27.2
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

7	L2	0.37	0.45	14.6	0.89	82.0	3.45	58.0	2.0	29.5
4	T1	0.11	0.14	14.6	0.89	25.1	1.87	17.7	0.6	29.6
14	R2	0.71	0.86	15.2	0.89	149.5	6.53	105.7	3.7	28.9
West: Greenbag Road										
5	L2	0.08	0.09	3.7	0.14	10.7	1.54	48.1	1.5	32.8
2	T1	0.78	0.93	7.0	0.23	93.3	9.16	251.9	7.5	33.4
12	R2	0.08	0.09	7.2	0.23	8.9	2.29	24.0	0.7	32.3

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	68.53	4.0	35.3	0.04	0.004	0.024
8	T1	72.12	4.2	37.1	0.04	0.004	0.025
18	R2	64.37	5.5	48.7	0.06	0.005	0.038
		205.02	13.6	121.1	0.14	0.012	0.087
East: Greenbag Road							
1	L2	11.09	1.4	12.8	0.01	0.001	0.032
6	T1	164.22	9.3	83.3	0.10	0.010	0.146
16	R2	6.55	0.4	3.3	0.00	0.000	0.005
		181.86	11.1	99.4	0.11	0.011	0.183
North: Dorsey Avenue							
7	L2	37.05	4.2	37.5	0.04	0.003	0.081
4	T1	11.46	1.6	13.9	0.02	0.001	0.027
14	R2	66.86	6.2	55.7	0.06	0.006	0.148
		115.37	11.9	107.0	0.12	0.010	0.256
West: Greenbag Road							
5	L2	26.74	2.4	21.9	0.02	0.002	0.067
2	T1	153.70	21.6	195.6	0.19	0.015	0.736
12	R2	15.04	2.9	27.1	0.02	0.002	0.126
		195.48	27.0	244.7	0.24	0.019	0.928
INTERSECTION:		697.73	63.6	572.2	0.61	0.053	1.455

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.33	33.0	167.6	0.18	0.017	0.114
8	T1	0.33	33.0	167.6	0.18	0.017	0.114
18	R2	0.33	22.2	249.7	0.31	0.024	0.195
		0.33	28.7	193.1	0.22	0.019	0.139
East: Greenbag Road							
1	L2	0.32	15.1	375.3	0.42	0.034	0.926
6	T1	0.31	35.2	158.5	0.18	0.018	0.278
16	R2	0.31	35.5	156.8	0.17	0.017	0.255
		0.31	32.6	171.2	0.20	0.019	0.316
North: Dorsey Avenue							
7	L2	0.40	13.8	401.7	0.46	0.037	0.872
4	T1	0.40	11.4	486.4	0.56	0.048	0.932
14	R2	0.39	17.0	327.2	0.34	0.033	0.873
		0.40	15.2	366.6	0.40	0.036	0.878
West: Greenbag Road							
5	L2	0.35	19.7	283.3	0.29	0.027	0.861
2	T1	0.38	11.6	482.6	0.47	0.037	1.815
12	R2	0.39	8.2	702.3	0.59	0.048	3.264
		0.37	12.0	469.3	0.45	0.036	1.780
INTERSECTION:		0.35	19.7	283.1	0.30	0.026	0.720

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	618	843	0.733	18.7	1.16	8.7	220.0	1600.0
East: Greenbag Road								
1	572	768	0.744	20.7	1.22	9.5	251.3	1600.0
North: Dorsey Avenue								
1	289	574	0.503	15.0	0.89	2.9	76.5	1600.0
West: Greenbag Road								
1	75	1141	0.066	3.7	0.14	0.2	6.5	460.0T
2	438	1144	0.383	7.0	0.23	1.9	51.7	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	618	150	843	0.733	100
East: Greenbag Road					
1	572	150	768	0.744	100
North: Dorsey Avenue					
1	289	150	574	0.503	100
West: Greenbag Road					
1	75	75	1141	0.066	100
2	438	150	1144	0.383	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	618	1		0.733	18.7	220	1600
	618	1		0.733	18.7	220	
East: Greenbag Road							
1	572	7		0.744	20.7	251	1600
	572	7		0.744	20.7	251	
North: Dorsey Avenue							
1	289	6		0.503	15.0	76	1600
	289	6		0.503	15.0	76	
West: Greenbag Road							
1	75	8		0.066	3.7	6	460
2	438	8		0.383	7.0	52	1600
	513	8		0.383	6.5	52	

ALL VEHICLES

Total Flow	% HV	Max X	Aver. Delay	Max Queue
1992	5	0.744	15.6	251

Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled

```
     intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout

-----------------------------------------------------
                                        Average  Driver
 Lane    Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       17.8   1420    2.54    66.05    25.20    1.57
-----------------------------------------------------
 East: Greenbag Road
 1       21.3   1380    2.61    81.31    26.33    1.76
-----------------------------------------------------
 North: Dorsey Avenue
 1       18.6   1380    2.61    71.23    26.28    1.65
-----------------------------------------------------
 West: Greenbag Road
 1      NA - Short Lane
 2       21.5   1420    2.54    79.92    26.54    1.69
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green           dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.733    NA      NA     4.3   7.9  10.8  18.7   4.7  14.8   5.7   9.1   0.0   18.7
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.744    NA      NA     4.7   8.4  12.3  20.7   5.9  15.7   6.2   9.4   0.0   20.7
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.503    NA      NA     6.3   8.8   6.2  15.0   4.2  11.8   2.4   9.4   0.0   15.0
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.066    NA      NA     3.2   3.5   0.2   3.7   4.6   2.5   0.0   2.5   0.0    3.7
 2      0.383    NA      NA     3.1   5.1   1.9   7.0   6.0   4.8   0.0   4.8   0.0    7.0
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)    Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green           No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.733    NA      NA     1.3    1.8   1.7    3.5    8.7  0.06   0.14    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.744    NA      NA     1.5    1.9   2.0    3.8    9.5  0.06   0.16    0.0    NA
-------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1    0.503    NA      NA     0.3    0.9   0.3    1.2    2.9  0.02   0.05    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
West: Greenbag Road												
1	0.066	NA	NA	0.0	0.1	0.0	0.1	0.2	0.01	0.01	NA	0.0
2	0.383	NA	NA	0.0	0.8	0.0	0.8	1.9	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Stor. Ratio Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.733	NA	NA	34.0	44.5	44.0	88.5	220.0	0.06	0.14	0.0	NA
East: Greenbag Road												
1	0.744	NA	NA	40.0	48.9	52.2	101.1	251.3	0.06	0.16	0.0	NA
North: Dorsey Avenue												
1	0.503	NA	NA	8.1	23.4	7.3	30.8	76.5	0.02	0.05	0.0	NA
West: Greenbag Road												
1	0.066	NA	NA	0.0	2.6	0.0	2.6	6.5	0.01	0.01	NA	0.0
2	0.383	NA	NA	0.0	20.8	0.0	20.8	51.7	0.01	0.03	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.733	NA	NA	1.3	3.2	5.8
East: Greenbag Road						
1	0.744	NA	NA	1.5	3.3	6.0
North: Dorsey Avenue						
1	0.503	NA	NA	0.3	1.2	2.2
West: Greenbag Road						
1	0.066	NA	NA	0.0	0.1	0.1
2	0.383	NA	NA	0.0	0.9	1.5

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.733	NA	NA	34.0	81.0	147.0
East: Greenbag Road						
1	0.744	NA	NA	40.0	86.7	157.2
North: Dorsey Avenue						
1	0.503	NA	NA	8.1	31.6	57.3
West: Greenbag Road						
1	0.066	NA	NA	0.0	2.1	3.7
2	0.383	NA	NA	0.0	22.6	41.0

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								

1	0.733	3.5	4.5	6.4	7.4	8.7	9.7	10.4
East: Greenbag Road								
1	0.744	3.8	5.0	7.0	8.1	9.5	10.6	11.4
North: Dorsey Avenue								
1	0.503	1.2	1.5	2.1	2.5	2.9	3.2	3.5
West: Greenbag Road								
1	0.066	0.1	0.1	0.2	0.2	0.2	0.3	0.3
2	0.383	0.8	1.0	1.4	1.7	1.9	2.2	2.3

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	Percentile Back of Queue (feet) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								
1	0.733	88.5	114.6	161.6	187.1	220.0	244.2	262.5
East: Greenbag Road								
1	0.744	101.1	130.9	184.6	213.7	251.3	279.0	299.9
North: Dorsey Avenue								
1	0.503	30.7	39.8	56.2	65.0	76.5	84.9	91.2
West: Greenbag Road								
1	0.066	2.6	3.4	4.8	5.5	6.5	7.2	7.7
2	0.383	20.8	26.9	38.0	44.0	51.7	57.4	61.7

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.733	NA	NA	0.84	0.32	0.00	1.16	716.6	0.90	554.6	0.84	1.74
East: Greenbag Road												
1	0.744	NA	NA	0.86	0.35	0.00	1.22	695.5	0.94	537.6	0.86	1.80
North: Dorsey Avenue												
1	0.503	NA	NA	0.76	0.13	0.00	0.89	256.6	0.40	116.5	0.76	1.16
West: Greenbag Road												
1	0.066	NA	NA	0.14	0.00	0.00	0.14	10.7	0.00	0.0	0.27	0.27
2	0.383	NA	NA	0.23	0.00	0.00	0.23	102.2	0.00	0.0	0.37	0.37

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

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Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	207.6	218.5	192.4	618.5
%HV (all designations)	1.0	1.0	1.0	1.0
From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	33.7	517.4	20.7	571.7
%HV (all designations)	5.0	7.0	0.0	6.6
From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	168.5	289.1

%HV (all designations)	0.0	0.0	11.0	6.4

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	75.0	400.0	38.0	513.0
%HV (all designations)	8.0	7.0	15.0	7.7

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

Site ID: 857/81
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	205.5	216.3	190.5	612.3
Mov Class %	99.0	99.0	99.0	99.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	32.0	481.2	20.7	533.8
Mov Class %	95.0	93.0	100.0	93.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	92.4	28.3	149.9	270.6
Mov Class %	100.0	100.0	89.0	93.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	69.0	372.0	32.3	473.3
Mov Class %	92.0	93.0	85.0	92.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	2.1	2.2	1.9	6.2
Mov Class %	1.0	1.0	1.0	1.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	1.7	36.2	0.0	37.9
Mov Class %	5.0	7.0	0.0	6.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	0.0	18.5	18.5
Mov Class %	0.0	0.0	11.0	6.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	6.0	28.0	5.7	39.7
Mov Class %	8.0	7.0	15.0	7.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.92	0.92	0.92	-
Residual Demand	0.0	0.0	0.0	0.0

```
--------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV             205.5   216.3   190.5   612.3
   HV               2.1     2.2     1.9     6.2
   Total          207.6   218.5   192.4   618.5
-------------------------------------------------
 Approach         207.6   218.5   192.4   618.5
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              32.0   481.2    20.7   533.8
   HV               1.7    36.2       *    37.9
   Total           33.7   517.4    20.7   571.7
-------------------------------------------------
 Approach          33.7   517.4    20.7   571.7
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              92.4    28.3   149.9   270.6
   HV                 *       *    18.5    18.5
   Total           92.4    28.3   168.5   289.1
-------------------------------------------------
 Approach          92.4    28.3   168.5   289.1
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:               L2      T1      R2     TOT
-------------------------------------------------
 Lane  1
   LV              69.0       *       *    69.0
   HV               6.0       *       *     6.0
   Total           75.0       *       *    75.0
 Lane  2
   LV                 *   372.0    32.3   404.3
   HV                 *    28.0     5.7    33.7
   Total              *   400.0    38.0   438.0
-------------------------------------------------
 Approach          75.0   400.0    38.0   513.0
-------------------------------------------------
  *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
Lane:  1           654.9    29.9   684.8
Total              654.9    29.9   684.8
-----------------------------------------
 Exit: NORTH
Lane:  1           305.9     8.2   314.1
Total              305.9     8.2   314.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1            92.6     7.4   100.0
Total               92.6     7.4   100.0
-----------------------------------------
 Exit: EAST
```

```
Lane:  1           654.9    29.9   684.8
Total              654.9    29.9   684.8
-----------------------------------------
 Exit: NORTH
Lane:  1           305.9     8.2   314.1
Total              305.9     8.2   314.1
-----------------------------------------
 Exit: WEST
Lane:  1           836.7    56.8   893.5
Total              836.7    56.8   893.5
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - AM Peak - Alt

```
Site ID: 857/81
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

Go to Table Links (Top)

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Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:25:49 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\LOS & Q\2048 Build\2019-04-04 Revised Roundabouts\Greenbag & Dorsey\Greenbag & Dorsey Roundabout HCM 6 - With Luckey to Remain.sip8

MOVEMENT SUMMARY

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Kingwood Pike												
3	L2	79	4.0	0.378	11.0	LOS B	1.7	43.1	0.67	0.73	0.87	30.9
8	T1	88	3.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.9
18	R2	75	2.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.2
Approach		242	3.0	0.378	10.9	LOS B	1.7	43.1	0.67	0.73	0.87	30.7
East: Greenbag Road												
1	L2	131	0.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.2
6	T1	471	1.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.2
16	R2	34	0.0	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	29.4
Approach		636	0.7	0.654	13.7	LOS B	8.3	209.5	0.77	0.88	1.22	30.1
North: Dorsey Avenue												
7	L2	149	1.0	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.3
4	T1	238	0.0	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.4
14	R2	162	2.0	0.811	28.1	LOS C	10.8	270.8	0.94	1.38	2.24	24.9
Approach		549	0.9	0.811	28.0	LOS C	10.8	270.8	0.94	1.38	2.24	25.2
West: Greenbag Road												
5	L2	164	0.0	0.186	5.9	LOS A	0.8	19.0	0.53	0.48	0.53	31.8
2	T1	584	1.0	0.855	27.2	LOS C	17.2	432.3	1.00	1.56	2.51	25.8
12	R2	166	0.0	0.855	27.2	LOS C	17.2	432.3	1.00	1.56	2.51	25.3
Approach		915	0.6	0.855	23.4	LOS C	17.2	432.3	0.91	1.37	2.16	26.6
All Vehicles		2342	1.0	0.855	20.6	LOS C	17.2	432.3	0.86	1.17	1.79	27.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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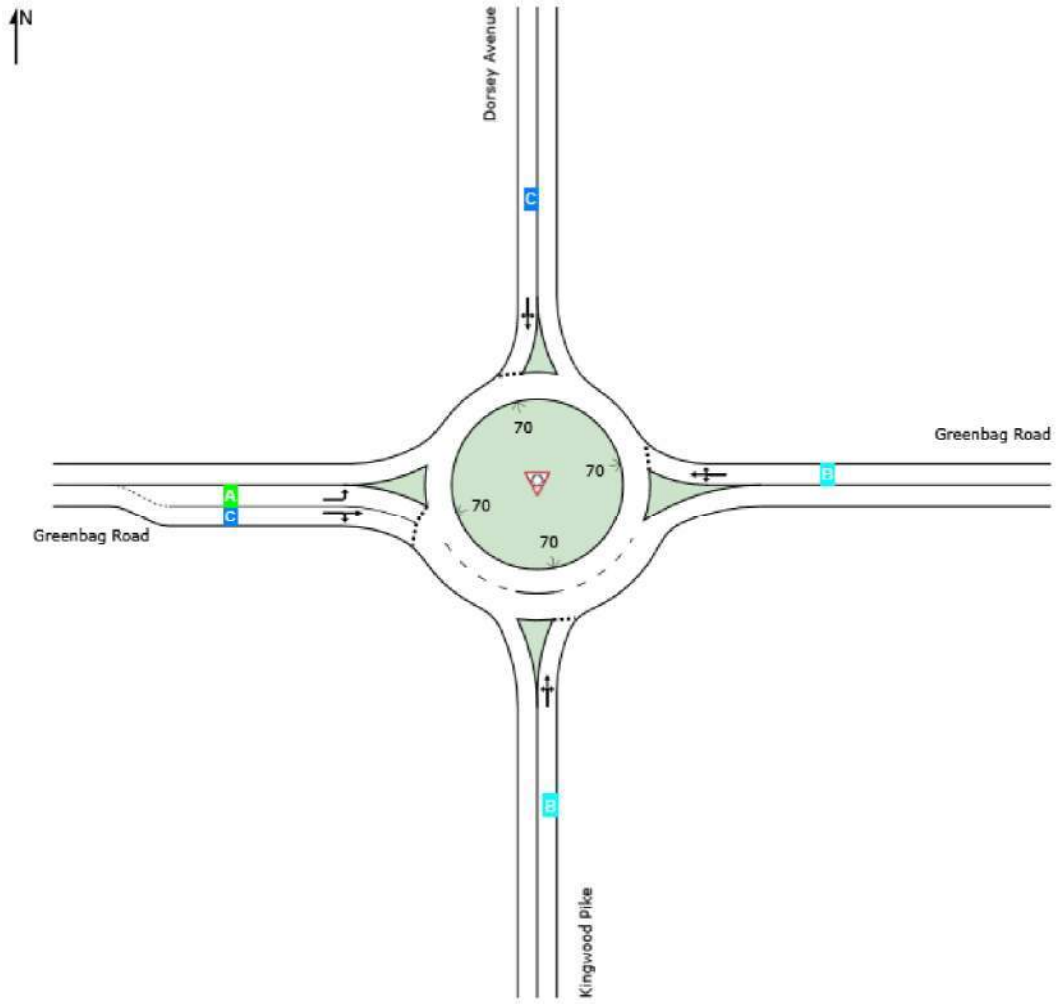
LANE LEVEL OF SERVICE

Lane Level of Service

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	B	C	C	C



Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

QUEUE DISTANCE (%ILE)

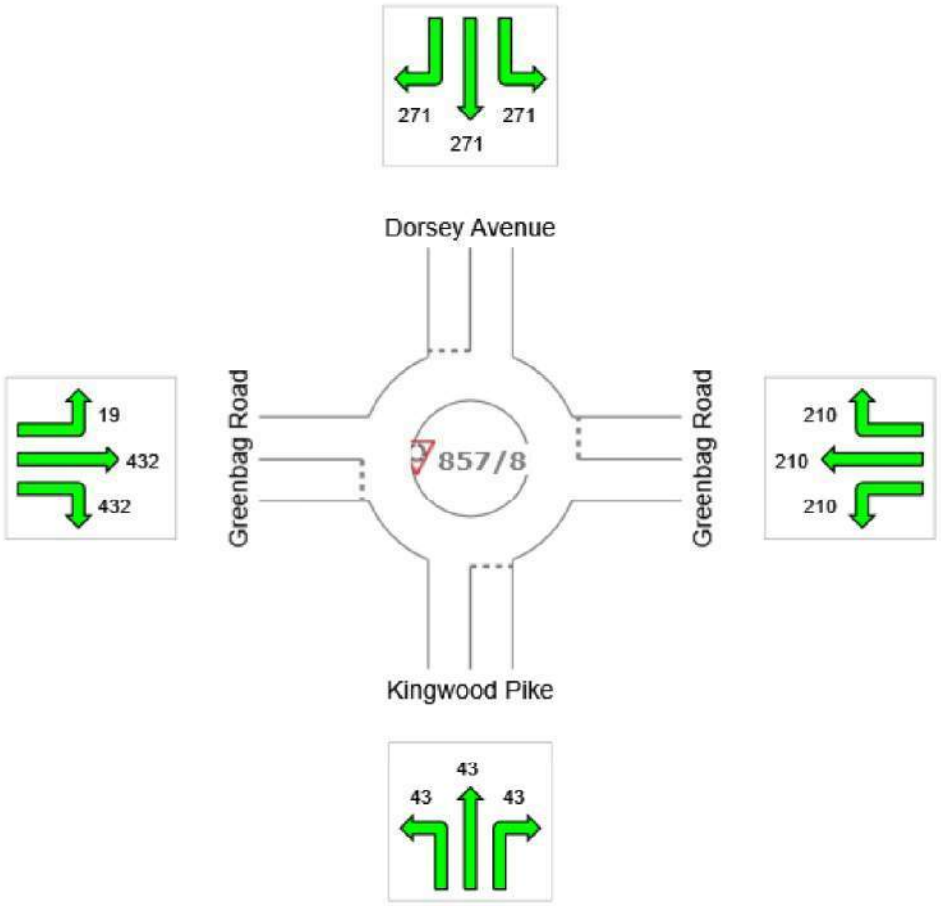
Largest 95% Back of Queue Distance for any lane used by vehicle movement (feet)

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

All Movement Classes

	Approaches				Intersection
	South	East	North	West	
Vehicle Queue (%ile)	43	210	271	432	432



Colour code based on Queue Storage Ratio

[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [> 1.0]

DETAILED OUTPUT

Site: 857/81 [Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt]

2048 Design Year With Luckey Lane to Remain
Roundabout
Site Category: PM Peak
Roundabout

OUTPUT TABLE LINKS

- Roundabouts
  - Roundabout Basic Parameters
  - Roundabout Circulating / Exiting Stream Parameters
  - Roundabout Gap Acceptance Parameters
  - Roundabout Flow Rates
- Movements
  - Intersection Negotiation and Travel Data
  - Movement Capacity and Performance Parameters
  - Fuel Consumption, Emissions and Cost
- Lanes
  - Lane Performance and Capacity Information
  - Lane, Approach and Intersection Performance
  - Driver Characteristics
  - Lane Delays
  - Lane Queues
  - Lane Queue Percentiles
  - Lane Stops
- Flow Rates
  - Origin-Destination Flow Rates (Total)
  - Origin-Destination Flow Rates by Movement Class
  - Lane Flow Rates
- Other
  - Parameter Settings Summary
  - Diagnostics

Roundabouts

Roundabout Basic Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Central Island Diam	Circ Width	Insc Diam.	Entry Radius	Entry Angle	Circ Lanes	Entry Lanes	Av.Entry Lane Width	App Dist	Prop Queued Upstr Signal	Extra Bunching
ft	ft	ft	ft	deg			ft	ft		%
South: Kingwood Pike										
70.0*	44.0*	142.0*	65.0*	30.0*	2	1	11.00*	1600	NA	0.0N
East: Greenbag Road										
70.0*	43.0*	141.0*	65.0*	30.0*	1	1	12.00*	1600	NA	0.0N
North: Dorsey Avenue										
70.0*	28.0*	142.0*	65.0*	30.0*	1	1	11.00*	1600	NA	0.0N
West: Greenbag Road										
70.0*	28.0*	141.0*	65.0*	30.0*	1	2	12.00*	1600	NA	0.0N

Roundabout Capacity Model: US HCM 6
* These parameters do not affect estimated capacity values in the HCM 6 Capacity Model.
NA Not Applicable (single Site analysis or unconnected Site in Network analysis).
N Program option resulted in zero value (single Site analysis or unconnected Site in Network analysis).

Go to Table Links (Top)

Roundabout Circulating / Exiting Stream Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	Opng Flow veh/h	HVE pcu/ veh	Adj. Flow pcu/h	%Near Lane Only	%Exit Flow Incl.	Cap. Const. Effect	O-D Factor	Aver Speed mph	In-Bunch Headway sec	Prop. Bunched
South: Kingwood Pike													
W	L2	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
N	T1	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
E	R2	1	Dominant	898	1.01	905	0.0	0.0	N	-	19.2	0.00	0.000
East: Greenbag Road													

S	L2	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
W	T1	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
N	R2	1	Dominant	330	1.02	336	0.0	0.0	N	-	16.1	0.00	0.000
North: Dorsey Avenue													
E	L2	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
S	T1	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
W	R2	1	Dominant	681	1.01	689	0.0	0.0	N	-	19.6	0.00	0.000
West: Greenbag Road													
N	L2	1	Subdominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000
E	T1	2	Dominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000
S	R2	2	Dominant	519	1.00	521	0.0	0.0	N	-	18.6	0.00	0.000

Roundabout Capacity Model: US HCM 6

Go to Table Links (Top)

Roundabout Gap Acceptance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Dest	Turn	Lane No.	Lane Type	In-Bunch Headway sec	Prop. Bunched	Priority Sharing	HVE for Entry	Critical Gap Headway sec	Critical Gap Dist ft	Follow-up Headway sec
South: Kingwood Pike										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
W	L2	1	Dominant	0.00	0.000	N	1.04	4.33	122.2	2.54
N	T1	1	Dominant	0.00	0.000	N	1.03	4.33	122.2	2.54
E	R2	1	Dominant	0.00	0.000	N	1.02	4.33	122.2	2.54
East: Greenbag Road										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
S	L2	1	Dominant	0.00	0.000	N	1.00	4.98	117.7	2.61
W	T1	1	Dominant	0.00	0.000	N	1.01	4.98	117.7	2.61
N	R2	1	Dominant	0.00	0.000	N	1.00	4.98	117.7	2.61
North: Dorsey Avenue										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
E	L2	1	Dominant	0.00	0.000	N	1.01	4.98	143.1	2.61
S	T1	1	Dominant	0.00	0.000	N	1.00	4.98	143.1	2.61
W	R2	1	Dominant	0.00	0.000	N	1.02	4.98	143.1	2.61
West: Greenbag Road										
Model Calibration Factor (HCM 6): 1.00										
Entry/Circ. Flow Adjustment (HCM 6): None										
N	L2	1	Subdominant	0.00	0.000	N	1.00	4.54	123.8	2.54
E	T1	2	Dominant	0.00	0.000	N	1.01	4.54	123.8	2.54
S	R2	2	Dominant	0.00	0.000	N	1.00	4.54	123.8	2.54

Roundabout Capacity Model: US HCM 6

Dist (Distance): Spacing, i.e. distance between the front ends of two successive vehicles across all lanes in the circulating or exiting stream

Go to Table Links (Top)

Roundabout Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

CIRCULATING LANE FLOW RATES

Lane No.	Circulating Flow Rate veh/h	pcu/h	Percent
South: Kingwood Pike			
1	164	164	18.1%
2	734	741	81.9%
Total	898	905	
East: Greenbag Road			
1	330	336	100.0%
Total	330	336	
North: Dorsey Avenue			
1	681	689	100.0%
Total	681	689	
West: Greenbag Road			
1	519	521	100.0%
Total	519	521	

The US HCM 6 roundabout capacity model option is in use.
This model considers only the total circulating flow and not the flow rates in individual circulating lanes. To model the effects of flow distribution in circulating lanes on the entry capacity results, you should use the

```
  SIDRA Standard roundabout capacity model.


APPROACH LANE FLOW RATES

---------------------------------------
  Lane        Approach Flows (veh/h)
  No.         Out  To Downst  Total
---------------------------------------
  South: Kingwood Pike
  1            75      167      242
  Total        75      167      242
---------------------------------------
  East: Greenbag Road
  1            34      602      636
  Total        34      602      636
---------------------------------------
  North: Dorsey Avenue
  1           162      387      549
  Total       162      387      549
---------------------------------------
  West: Greenbag Road
  1             0      164      164
  2           166      585      751
  Total       166      749      915
---------------------------------------
```

Go to Table Links (Top)

Movements

Intersection Negotiation and Travel Data
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


TRAVEL SPEED, TRAVEL DISTANCE AND TRAVEL TIME

-------------------------------------------------------------------------------------------------------
                          Running  Travel   Travel   Travel  Total Travel Distance  Tot.Trav.
 From      To                Speed   Speed  Distance   Time   Dem Flows   Arv Flows     Time
 Approach  Exit      Turn     mph     mph       ft        s    veh-mi/h    veh-mi/h   veh-h/h
-------------------------------------------------------------------------------------------------------
South: Kingwood Pike
             West    L2       34.0    30.9    3324.6#   73.4#      49.5        49.5      1.6
            North    T1       34.0    30.9    3324.6#   73.3#      55.2        55.2      1.8
             East    R2       33.1    30.2    3324.6#   75.0#      47.4        47.4      1.6
-------------------------------------------------------------------------------------------------------
East: Greenbag Road
            South    L2       32.9    30.2    3341.4#   75.4#      83.2        83.2      2.8
             West    T1       32.9    30.2    3341.4#   75.5#     297.9       297.9      9.9
            North    R2       32.0    29.4    3341.4#   77.4#      21.3        21.3      0.7
-------------------------------------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2       30.6    25.3    3328.6#   89.6#      94.2        94.2      3.7
            South    T1       30.8    25.4    3328.6#   89.4#     150.2       150.2      5.9
             West    R2       30.0    24.9    3328.6#   91.2#     102.0       102.0      4.1
-------------------------------------------------------------------------------------------------------
West: Greenbag Road
            North    L2       33.5    31.8    3387.2#   72.5#     105.2       105.2      3.3
             East    T1       29.7    25.8    3314.0#   87.5#     366.7       366.7     14.2
            South    R2       29.1    25.3    3314.0#   89.2#     104.4       104.4      4.1
-------------------------------------------------------------------------------------------------------
 ALL VEHICLES:               31.4    27.5    3331.1#   82.5#    1477.3      1477.3     53.7
-------------------------------------------------------------------------------------------------------
  "Running Speed" is the average speed excluding stopped periods.

  Travel Time values include cruise times and intersection delays including
  acceleration, deceleration and idling delays.

  #  Travel Distance and Travel Time values include travel on the External Exit section based
     on the Exit Distance or user-specified Downstream Distance value as applicable.


INTERSECTION NEGOTIATION DATA

-------------------------------------------------------------------------
                          Negn  Negn    Negn    App    Exit  Downstr
 From      To              Radius Speed   Dist    Dist   Dist   Dist
 Approach  Exit      Turn     ft    mph     ft      ft     ft     ft
-------------------------------------------------------------------------
South: Kingwood Pike
             West    L2      47.8   14.5  187.8   1600     488     NA
            North    T1     123.9   20.8  128.6   1600     488     NA
             East    R2      84.2   17.9   55.3   1600     488     NA
-------------------------------------------------------------------------
East: Greenbag Road
            South    L2      50.9   14.8  199.8   1600     488     NA
             West    T1     141.2   21.8  131.2   1600     488     NA
            North    R2      83.8   17.9   54.9   1600     488     NA
-------------------------------------------------------------------------
North: Dorsey Avenue
             East    L2      50.8   14.8  199.6   1600     488     NA
            South    T1     163.1   23.0  133.5   1600     488     NA
             West    R2     111.9   20.0   54.9   1600     488     NA
-------------------------------------------------------------------------
West: Greenbag Road
            North    L2      47.7   14.4  187.2   1600     488     NA
```

```
            East    T1     140.0   21.7  131.0   1600     488     NA
           South    R2      97.7   19.0   54.7   1600     488     NA
------------------------------------------------------------------------

  Maximum Negotiation (Design) Speed =  30.0 mph

  NA Downstream Distance does not apply if:
     - Exit is an internal leg of a network
     - "Program" option was specified
     - Distance specified was less than the Exit Negotiation Distance
     - Distance specified was greater than the exit leg length


MOVEMENT SPEEDS AND GEOMETRIC DELAY

-------------------------------------------------------
           App. Speeds    Exit Speeds    Queue
           -----------    -----------   Move-up   Geom
 Mov       Cruise  Negn   Negn Cruise    Speed    Delay
 ID   Turn   mph    mph    mph   mph      mph       sec
-------------------------------------------------------
South: Kingwood Pike
    3  L2    40.0   14.5   14.5  40.0     15.6      0.0
    8  T1    40.0   20.8   20.8  40.0     15.6      0.0
   18  R2    40.0   17.9   17.9  40.0     15.6      0.0
-------------------------------------------------------
East: Greenbag Road
    1  L2    40.0   14.8   14.8  40.0     23.1      0.0
    6  T1    40.0   21.8   21.8  40.0     23.1      0.0
   16  R2    40.0   17.9   17.9  40.0     23.1      0.0
-------------------------------------------------------
North: Dorsey Avenue
    7  L2    40.0   14.8   14.8  40.0     17.0      0.0
    4  T1    40.0   23.0   23.0  40.0     17.0      0.0
   14  R2    40.0   20.0   20.0  40.0     17.0      0.0
-------------------------------------------------------
West: Greenbag Road
    5  L2    40.0   14.4   14.4  40.0     19.2      0.0
    2  T1    40.0   21.7   21.7  40.0     19.3      0.0
   12  R2    40.0   19.0   19.0  40.0     19.3      0.0
-------------------------------------------------------
  HCM Delay Formula option used: Geometric Delay is not included in Control Delay.
```

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Movement Capacity and Performance Parameters
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


MOVEMENT CAPACITY PARAMETERS

-----------------------------------------------------------------
 Mov  Turn Mov         Opng Movement  Total  Prac.  Prac.  Deg.
 ID        Cl.  Arv          Adjust.  Cap.  Deg.   Spare  Satn
              Flow   Flow   Flow           Satn   Cap.
              veh/h  veh/h  pcu/h   veh/h   xp      %      x
-----------------------------------------------------------------
South: Kingwood Pike
    3  L2  #      79    898    905     208   0.85    125  0.378
    8  T1  #      88    898    905     232   0.85    125  0.378
   18  R2  #      75    898    905     199   0.85    125  0.378
-----------------------------------------------------------------
East: Greenbag Road
    1  L2  #     131    330    336     201   0.85     30  0.654
    6  T1  #     471    330    336     720   0.85     30  0.654
   16  R2  #      34    330    336      52   0.85     30  0.654
-----------------------------------------------------------------
North: Dorsey Avenue
    7  L2  #     149    681    689     184   0.85      5  0.811
    4  T1  #     238    681    689     294   0.85      5  0.811
   14  R2  #     162    681    689     200   0.85      5  0.811
-----------------------------------------------------------------
West: Greenbag Road
    5  L2  #     164    519    521     884   0.85    358  0.186
    2  T1  #     584    519    521     683   0.85     -1  0.855*
   12  R2  #     166    519    521     194   0.85     -1  0.855*
-----------------------------------------------------------------
  *  Maximum degree of saturation
  # Combined Movement Capacity parameters are shown for all Movement Classes.


MOVEMENT PERFORMANCE

-------------------------------------------------------------------------------------
 Mov  Turn Total    Total   Aver.  Eff.  Total  Perf. Tot.Trav. Tot.Trav. Aver.
 ID        Delay    Delay   Delay  Stop  Stops  Index Distance    Time    Speed
        (veh-h/h)(pers-h/h)(sec)  Rate                (veh-mi/h)(veh-h/h) (mph)
-------------------------------------------------------------------------------------
South: Kingwood Pike
    3  L2   0.24    0.29    11.0   0.73    57.8  3.15     49.5     1.6     30.9
    8  T1   0.27    0.32    10.9   0.73    64.4  3.36     55.2     1.8     30.9
   18  R2   0.23    0.27    10.9   0.73    55.3  3.07     47.4     1.6     30.2
-------------------------------------------------------------------------------------
East: Greenbag Road
    1  L2   0.50    0.60    13.7   0.88   116.2  6.58     83.2     2.8     30.2
    6  T1   1.79    2.15    13.7   0.88   416.0 18.25    297.9     9.9     30.2
   16  R2   0.13    0.15    13.7   0.88    29.8  4.18     21.3     0.7     29.4
-------------------------------------------------------------------------------------
North: Dorsey Avenue
```

7	L2	1.16	1.40	28.0	1.38	205.5	13.32	94.2	3.7	25.3
4	T1	1.85	2.22	28.0	1.38	327.6	11.75	150.2	5.9	25.4
14	R2	1.26	1.51	28.1	1.38	222.5	13.71	102.0	4.1	24.9
West: Greenbag Road										
5	L2	0.27	0.32	5.9	0.48	79.3	3.65	105.2	3.3	31.8
2	T1	4.42	5.30	27.2	1.56	911.7	32.48	366.7	14.2	25.8
12	R2	1.26	1.51	27.2	1.56	259.5	12.22	104.4	4.1	25.3

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Fuel Consumption, Emissions and Cost
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

FUEL CONSUMPTION, EMISSIONS AND COST (TOTAL)

Mov ID	Turn	Cost Total $/h	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h
South: Kingwood Pike							
3	L2	23.32	1.5	13.2	0.01	0.001	0.016
8	T1	25.98	1.6	14.7	0.02	0.002	0.018
18	R2	22.67	2.1	19.3	0.02	0.002	0.025
		71.98	5.3	47.2	0.05	0.005	0.060
East: Greenbag Road							
1	L2	39.01	4.5	40.5	0.05	0.004	0.021
6	T1	135.52	7.6	68.1	0.07	0.007	0.031
16	R2	9.70	0.5	4.9	0.01	0.000	0.002
		184.23	12.7	113.4	0.13	0.012	0.054
North: Dorsey Avenue							
7	L2	65.06	6.5	57.8	0.07	0.006	0.052
4	T1	104.74	12.5	111.2	0.14	0.012	0.085
14	R2	69.71	5.5	49.2	0.05	0.005	0.043
		239.51	24.5	218.3	0.26	0.023	0.179
West: Greenbag Road							
5	L2	55.94	4.2	37.3	0.04	0.004	0.016
2	T1	241.29	24.4	217.7	0.26	0.022	0.206
12	R2	69.40	8.5	75.3	0.09	0.008	0.060
		366.63	37.1	330.2	0.40	0.034	0.283
INTERSECTION:		862.34	79.6	709.1	0.85	0.074	0.576

FUEL CONSUMPTION, EMISSIONS AND COST (RATE)

Mov ID	Turn	Cost Rate $/mi	Fuel Eff. mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km
South: Kingwood Pike							
3	L2	0.29	33.5	165.8	0.19	0.017	0.207
8	T1	0.29	33.5	165.6	0.18	0.017	0.204
18	R2	0.30	22.0	252.6	0.31	0.023	0.327
		0.29	28.8	192.8	0.22	0.019	0.243
East: Greenbag Road							
1	L2	0.29	18.3	302.2	0.39	0.031	0.156
6	T1	0.28	39.0	142.0	0.15	0.015	0.065
16	R2	0.28	39.0	141.8	0.15	0.014	0.062
		0.28	31.6	175.1	0.20	0.018	0.083
North: Dorsey Avenue							
7	L2	0.43	14.5	381.5	0.46	0.039	0.340
4	T1	0.43	12.0	460.3	0.57	0.049	0.351
14	R2	0.42	18.5	299.8	0.33	0.033	0.262
		0.43	14.1	391.6	0.47	0.042	0.322
West: Greenbag Road							
5	L2	0.33	25.1	220.0	0.25	0.024	0.095
2	T1	0.41	15.0	368.9	0.45	0.038	0.349
12	R2	0.41	12.3	448.0	0.55	0.048	0.360
		0.40	15.6	356.0	0.43	0.037	0.305
INTERSECTION:		0.36	18.6	298.3	0.36	0.031	0.242

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Lanes

Lane Performance and Capacity Information
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

LANE PERFORMANCE

Lane No.	Flow veh/h	Cap veh/h	Deg. Satn x	Aver. Delay sec	Eff. Stop Rate	Queue 95% Back veh	Queue 95% Back ft	Lane Length ft
South: Kingwood Pike								
1	242	639	0.378	10.9	0.73	1.7	43.1	1600.0
East: Greenbag Road								
1	636	972	0.654	13.7	0.88	8.3	209.5	1600.0
North: Dorsey Avenue								
1	549	678	0.811	28.0	1.38	10.8	270.8	1600.0
West: Greenbag Road								
1	164	884	0.186	5.9	0.48	0.8	19.0	460.0T
2	751	877	0.855	27.2	1.56	17.2	432.3	1600.0

T Short lane due to specification of Turn Bay

LANE FLOW AND CAPACITY INFORMATION

Lane No.	Total Arv Flow veh/h	Min Cap veh/h	Tot Cap veh/h	Deg. Satn x	Lane Util %
South: Kingwood Pike					
1	242	150	639	0.378	100
East: Greenbag Road					
1	636	150	972	0.654	100
North: Dorsey Avenue					
1	549	150	678	0.811	100
West: Greenbag Road					
1	164	150	884	0.186	100
2	751	150	877	0.855	100

The capacity values of Continuous Lanes are obtained by adjusting the basic saturation flow for lane width, grade, movement class and turning vehicle effects. Saturation flow scale applies if specified.

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Lane, Approach and Intersection Performance
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Arrival Flow (veh/h)	%HV	Adj. Basic Satf.	Deg Sat x	Aver. Delay sec	Longest Queue ft	Lane Length ft
South: Kingwood Pike							
1	242	3		0.378	10.9	43	1600
	242	3		0.378	10.9	43	
East: Greenbag Road							
1	636	1		0.654	13.7	210	1600
	636	1		0.654	13.7	210	
North: Dorsey Avenue							
1	549	1		0.811	28.0	271	1600
	549	1		0.811	28.0	271	
West: Greenbag Road							
1	164	0		0.186	5.9	19	460
2	751	1		0.855	27.2	432	1600
	915	1		0.855	23.4	432	
ALL VEHICLES							
	Total Flow	% HV		Max X	Aver. Delay	Max Queue	
	2342	1		0.855	20.6	432	

Peak flow period = 15 minutes.

Queue values in this table are 95% queue (feet)
Note: Basic Saturation Flows at roundabouts or sign-controlled

```
     intersections apply only to continuous lanes.
```

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Driver Characteristics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout

-----------------------------------------------------
                                        Average  Driver
 Lane    Satn    Satn    Satn    Satn    Queue  Response
 No.    Speed   Flow    Hdwy   Spacing   Space    Time
         mph    veh/h   sec      ft       ft      sec
-----------------------------------------------------
 South: Kingwood Pike
 1       17.8   1420    2.54    66.28    25.60    1.56
-----------------------------------------------------
 East: Greenbag Road
 1       20.2   1380    2.61    77.10    25.15    1.76
-----------------------------------------------------
 North: Dorsey Avenue
 1       19.9   1380    2.61    76.11    25.17    1.75
-----------------------------------------------------
 West: Greenbag Road
 1      NA - Short Lane
 2       21.1   1420    2.54    78.54    25.16    1.72
-----------------------------------------------------

  Saturation Flow and Saturation Headway are derived from follow-up headway.
```

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Lane Delays
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE DELAYS

-------------------------------------------------------------------------------------------------
                              ------------------  Delay (seconds/veh)  -------------------
         Deg.  % Arv   Prog.    Min   Stop-line Delay  Acc.   Queuing   Stopd
 Lane    Satn  During  Factor   Del   1st   2nd Total  Dec.  Total MvUp (Idle) Geom Control
 No.       x   Green           dm    d1    d2   dSL   dn    dq   dqm    di    dig   dic
-------------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1      0.378    NA      NA     5.6   7.5   3.4  10.9   4.7   7.8   1.1   6.6   0.0   10.9
-------------------------------------------------------------------------------------------------
 East: Greenbag Road
 1      0.654    NA      NA     3.7   7.0   6.7  13.7   5.4   9.5   3.2   6.3   0.0   13.7
-------------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1      0.811    NA      NA     5.3   9.4  18.7  28.0   4.9  23.4   7.8  15.6   0.0   28.0
-------------------------------------------------------------------------------------------------
 West: Greenbag Road
 1      0.186    NA      NA     4.1   5.0   0.9   5.9   4.6   3.5   0.0   3.5   0.0    5.9
 2      0.855    NA      NA     4.1   8.4  18.8  27.2   5.8  21.5  10.0  11.5   0.0   27.2
-------------------------------------------------------------------------------------------------
  HCM Delay Formula option used (Exclude Geometric Delay option applies). Control
  Delay does not include Geometric Delay, and Stop-line Delay is treated as being
  same as Control Delay.
  dm: Minimum delay for gap acceptance cases
  dSL: Stop-line delay (=d1+d2)
  dn: Average stop-start delay for all vehicles queued and unqueued
  dq: Queuing delay (the part of the stop-line delay that includes
      stopped delay and queue move-up delay)
  dqm: Queue move-up delay
  di: Stopped delay (stopped (idling) time at near-zero speed)
  dig: Geometric delay
  dic: Control delay
```

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Lane Queues
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


BACK OF QUEUE (VEHICLES)

-------------------------------------------------------------------------------------------
       Deg.  % Arv   Prog.   Ovrfl.    Back of Queue (veh)    Queue Stor.  Prob.  Prob.
 Lane  Satn  During  Factor  Queue   ----------------------     Ratio     Block  SL Ov.
 No.     x   Green           No     Nb1   Nb2    Nb     95%   Av.    95%     %      %
-------------------------------------------------------------------------------------------
 South: Kingwood Pike
 1    0.378    NA      NA     0.1    0.6   0.1    0.7    1.7  0.01   0.03    0.0    NA
-------------------------------------------------------------------------------------------
 East: Greenbag Road
 1    0.654    NA      NA     0.9    1.9   1.4    3.4    8.3  0.05   0.13    0.0    NA
-------------------------------------------------------------------------------------------
 North: Dorsey Avenue
 1    0.811    NA      NA     1.9    2.0   2.3    4.3   10.8  0.07   0.17    0.0    NA
```

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Ratio Stor. Av.	95%	Prob. Block %	Prob. SL Ov. %
West: Greenbag Road												
1	0.186	NA	NA	0.0	0.3	0.0	0.3	0.8	0.02	0.04	NA	0.0
2	0.855	NA	NA	3.1	2.6	4.3	6.9	17.2	0.11	0.27	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

BACK OF QUEUE (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Back of Queue (ft) Nb1	Nb2	Nb	95%	Queue Ratio Stor. Av.	95%	Prob. Block %	Prob. SL Ov. %
South: Kingwood Pike												
1	0.378	NA	NA	2.7	15.1	2.2	17.3	43.1	0.01	0.03	0.0	NA
East: Greenbag Road												
1	0.654	NA	NA	23.4	48.6	35.7	84.3	209.5	0.05	0.13	0.0	NA
North: Dorsey Avenue												
1	0.811	NA	NA	48.7	51.0	58.0	109.0	270.8	0.07	0.17	0.0	NA
West: Greenbag Road												
1	0.186	NA	NA	0.0	7.7	0.0	7.7	19.0	0.02	0.04	NA	0.0
2	0.855	NA	NA	78.0	66.2	107.8	174.0	432.3	0.11	0.27	0.0	NA

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

OTHER QUEUE RESULTS (VEHICLES)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.378	NA	NA	0.1	0.7	1.3
East: Greenbag Road						
1	0.654	NA	NA	0.9	2.4	4.4
North: Dorsey Avenue						
1	0.811	NA	NA	1.9	4.3	7.8
West: Greenbag Road						
1	0.186	NA	NA	0.0	0.3	0.5
2	0.855	NA	NA	3.1	5.7	10.3

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

OTHER QUEUE RESULTS (DISTANCE)

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	Ovrfl. Queue No	Cyc-Av. Queue Nc	95%
South: Kingwood Pike						
1	0.378	NA	NA	2.7	18.8	34.0
East: Greenbag Road						
1	0.654	NA	NA	23.4	60.8	110.3
North: Dorsey Avenue						
1	0.811	NA	NA	48.7	107.7	195.3
West: Greenbag Road						
1	0.186	NA	NA	0.0	6.7	12.2
2	0.855	NA	NA	78.0	142.7	258.9

HCM Delay Formula option used:
Cycle-Average Queue is calculated using average delay from the HCM equation.
(i.e. HCM delays are treated as stop-line delays for this purpose).

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Lane Queue Percentiles
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

LANE QUEUE PERCENTILES (VEHICLES)

Lane No.	Deg. Satn x	Percentile Back of Queue (veh) 50%	70%	85%	90%	95%	98%	100%
South: Kingwood Pike								

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
1	0.378	0.7	0.9	1.2	1.4	1.7	1.9	2.0
East: Greenbag Road								
1	0.654	3.4	4.3	6.1	7.1	8.3	9.2	9.9
North: Dorsey Avenue								
1	0.811	4.3	5.6	7.9	9.1	10.8	11.9	12.8
West: Greenbag Road								
1	0.186	0.3	0.4	0.6	0.6	0.8	0.8	0.9
2	0.855	6.9	9.0	12.6	14.6	17.2	19.1	20.5

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

LANE QUEUE PERCENTILES (DISTANCE)

Lane No.	Deg. Satn x	50%	70%	85%	90%	95%	98%	100%
		Percentile Back of Queue (feet)						
South: Kingwood Pike								
1	0.378	17.3	22.4	31.6	36.6	43.1	47.8	51.4
East: Greenbag Road								
1	0.654	84.3	109.2	153.9	178.2	209.5	232.6	250.0
North: Dorsey Avenue								
1	0.811	108.9	141.1	198.9	230.3	270.8	300.5	323.1
West: Greenbag Road								
1	0.186	7.7	9.9	14.0	16.2	19.0	21.1	22.7
2	0.855	173.9	225.2	317.5	367.6	432.3	479.8	515.8

SIDRA Standard models are used for Back of Queue estimation since HCM only gives Cycle-Average Queues for unsignalised intersections.

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Lane Stops
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

Lane No.	Deg. Satn x	% Arv During Green	Prog. Factor	-- Effective Stop Rate -- he1	he2	Geom. hig	Overall h	Total Stops H	Queue Move-up Rate hqm	Total Queue Move-ups Hqm	Prop. Queued pq	Aver. Num. of Cycles to Depart
South: Kingwood Pike												
1	0.378	NA	NA	0.67	0.06	0.00	0.73	177.5	0.19	47.0	0.67	0.87
East: Greenbag Road												
1	0.654	NA	NA	0.69	0.19	0.00	0.88	561.9	0.44	281.7	0.77	1.22
North: Dorsey Avenue												
1	0.811	NA	NA	0.94	0.43	0.00	1.38	755.7	1.29	710.9	0.94	2.24
West: Greenbag Road												
1	0.186	NA	NA	0.48	0.00	0.00	0.48	79.3	0.00	0.0	0.53	0.53
2	0.855	NA	NA	1.00	0.56	0.00	1.56	1171.2	1.52	1137.2	1.00	2.51

hig is the average value for all movements in a shared lane
hqm is average queue move-up rate for all vehicles queued and unqueued

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Flow Rates

Origin-Destination Flow Rates (Total)
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

TOTAL FLOW RATES for All Movement Classes (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	78.7	87.6	75.3	241.6
%HV (all designations)	4.0	3.0	2.0	3.0
From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	470.8	33.7	636.0
%HV (all designations)	0.0	1.0	0.0	0.7
From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	149.4	238.2	161.8	549.4

%HV (all designations)	1.0	0.0	2.0	0.9

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	584.3	166.3	914.6
%HV (all designations)	0.0	1.0	0.0	0.6

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes = 60 minutes
Peak Flow Period = 15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in network analysis.

Go to Table Links (Top)

Origin-Destination Flow Rates by Movement Class
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

Site ID: 857/81
Roundabout

FLOW RATES for Light Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	75.5	85.0	73.8	234.3
Mov Class %	96.0	97.0	98.0	97.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	131.5	466.1	33.7	631.2
Mov Class %	100.0	99.0	100.0	99.3
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	147.9	238.2	158.6	544.7
Mov Class %	99.0	100.0	98.0	99.1
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	164.0	578.4	166.3	908.8
Mov Class %	100.0	99.0	100.0	99.4
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

FLOW RATES for Heavy Vehicles (veh/h)

From SOUTH To:	W	N	E	
Turn:	L2	T1	R2	TOT
Flow Rate	3.1	2.6	1.5	7.3
Mov Class %	4.0	3.0	2.0	3.0
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From EAST To:	S	W	N	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	4.7	0.0	4.7
Mov Class %	0.0	1.0	0.0	0.7
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From NORTH To:	E	S	W	
Turn:	L2	T1	R2	TOT
Flow Rate	1.5	0.0	3.2	4.7
Mov Class %	1.0	0.0	2.0	0.9
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

From WEST To:	N	E	S	
Turn:	L2	T1	R2	TOT
Flow Rate	0.0	5.8	0.0	5.8
Mov Class %	0.0	1.0	0.0	0.6
Flow Scale	1.00	1.00	1.00	-
Peak Flow Factor	0.89	0.89	0.89	-
Residual Demand	0.0	0.0	0.0	0.0

```
-----------------------------------------------------

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Lane Flow Rates
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


LANE FLOW RATES AT STOP LINE (veh/h)

-------------------------------------------------
 From SOUTH To:       W       N       E
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV               75.5    85.0    73.8   234.3
   HV                3.1     2.6     1.5     7.3
   Total            78.7    87.6    75.3   241.6
-------------------------------------------------
 Approach           78.7    87.6    75.3   241.6
-------------------------------------------------
 From EAST To:        S       W       N
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              131.5   466.1    33.7   631.2
   HV                  *     4.7       *     4.7
   Total           131.5   470.8    33.7   636.0
-------------------------------------------------
 Approach          131.5   470.8    33.7   636.0
-------------------------------------------------
 From NORTH To:       E       S       W
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              147.9   238.2   158.6   544.7
   HV                1.5       *     3.2     4.7
   Total           149.4   238.2   161.8   549.4
-------------------------------------------------
 Approach          149.4   238.2   161.8   549.4
-------------------------------------------------
 From WEST To:        N       E       S
 Turn:                L2      T1      R2      TOT
-------------------------------------------------
 Lane  1
   LV              164.0       *       *   164.0
   Total           164.0       *       *   164.0
 Lane  2
   LV                  *   578.4   166.3   744.7
   HV                  *     5.8       *     5.8
   Total               *   584.3   166.3   750.6
-------------------------------------------------
 Approach          164.0   584.3   166.3   914.6
-------------------------------------------------
   *  Movement not allocated to the lane


EXIT LANE FLOW RATES

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
   *  Movement not allocated to the lane


DOWNSTREAM LANE FLOW RATES FOR EXIT ROADS

-----------------------------------------
Movement Class:       LV      HV     TOT
-----------------------------------------
 Exit: SOUTH
Lane:  1           536.0       *   536.0
Total              536.0       *   536.0
-----------------------------------------
 Exit: EAST
Lane:  1           800.1     8.8   809.0
```

```
Total              800.1     8.8   809.0
-----------------------------------------
 Exit: NORTH
Lane:  1           282.8     2.6   285.4
Total              282.8     2.6   285.4
-----------------------------------------
 Exit: WEST
Lane:  1           700.1    11.1   711.2
Total              700.1    11.1   711.2
-----------------------------------------
  *  Movement not allocated to the lane

Flow rates shown above are Arrival Flow Rates (veh/h) based on the following input specifications:
Unit Time for Volumes =  60 minutes
Peak Flow Period =  15 minutes
Effects of Volume Factors (Peak Flow Factor, Flow Scale, Growth Rate) are included.
Arrival Flow Rates may be less than Demand Flow Rates if capacity constraint applies in
network analysis.
```

Go to Table Links (Top)

Other

Parameter Settings Summary
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


* Basic Parameters:
  Intersection Type: Roundabout
    US HCM 6 Roundabout Capacity Model used
  Driving on the right-hand side of the road
  Input data specified in US units
  Model Defaults: US HCM (Customary)
  Peak Flow Period (for performance): 15 minutes
  Unit time (for volumes): 60 minutes.
  HCM Delay Model option used
  HCM Queue Model option used
  Level of Service based on: Delay (SIDRA)
  Queue percentile: 95%
```

Go to Table Links (Top)

Diagnostics
Site: Greenbag Rd & Dorsey Ave-Kingwood Pike - PM Peak - Alt

```
Site ID: 857/81
Roundabout


Lane Flow-Capacity Iterations:

  Site Model Variability Index (Iterations 3 to N):   0.0%
  Number of Iterations: 3 (Maximum: 10)

Other Diagnostic Messages (if any):
```

Go to Table Links (Top)

SIDRA INTERSECTION 8.0 | Copyright © 2000-2019 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: STAHL SHAEFFER ENGINEERING LLC | Processed: Wednesday, April 03, 2019 11:27:43 AM
Project: X:\Clients\WVDOH\18-141 Greenbag Road\06 Traffic\B - Analyses\LOS & Q\2048 Build\2019-04-04 Revised Roundabouts\Greenbag & Dorsey\Greenbag & Dorsey Roundabout HCM 6 - With Luckey to Remain.sip8

STAHL SHEAFFER ENGINEERING

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August 28, 2019

Mr. Donald Meadows
West Virginia Division of Highways
Traffic Engineering - Operations
Building 5, Room A-550
1900 Kanawha Blvd. E.
Charleston, WV 25305

TRANSMITTAL VIA E-MAIL ONLY

RE: Turn Lane Warrant Study
Greenbag Road (CR 857) and Bluegrass Village Driveway
City of Morgantown, Monongalia County, West Virginia

Dear Mr. Meadows:

Stahl Sheaffer Engineering, LLC (Stahl Sheaffer) has completed a turn lane warrant study for the Greenbag Road (CR 857) and Bluegrass Village Driveway intersection, which is located approximately 800-feet west of the Greenbag Road (CR 857) and Dorsey Avenue/Kingwood Pike (CR 81) intersection in the City of Morgantown, Monongalia County. This evaluation was completed to determine if turn lanes would be required at the intersection of Greenbag Road with Bluegrass Village Driveway and to incorporate these potential turn lane improvements in conjunction with the proposed Greenbag Road and Dorsey Avenue/Kingwood Pike intersection improvements. The following sections of this correspondence details the turn lane warrant evaluation of the Greenbag Road and Bluegrass Village Driveway intersection.

Study Area

The intersection of Greenbag Road and Bluegrass Village Driveway is a T-intersection that operates as two-way stop controlled (TWSC), with a stop sign on the southbound Bluegrass Village Driveway and free-flowing on Greenbag Road. All approaches to this intersection currently provide a single lane to accommodate all applicable movements. Bluegrass Village Driveway provides access to the Bluegrass Village Mobile Home Park, which facilitates 186 mobile homes. An aerial image of the existing intersection and Bluegrass Village Mobile Home Park are included in the enclosure provided with this correspondence.

Traffic Volume Development

2048 Design Year weekday AM and weekday PM peak hour traffic volumes were developed for the intersection of Greenbag Road and Bluegrass Village Driveway through utilization of the following:

- Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*, Land Use 240, Mobile Home Park, to project traffic associated with the existing 186 dwelling units at the

Bluegrass Village Mobile Home Park. The anticipated site generated traffic volumes associated with the Bluegrass Village Mobile Home Park was projected as follows:

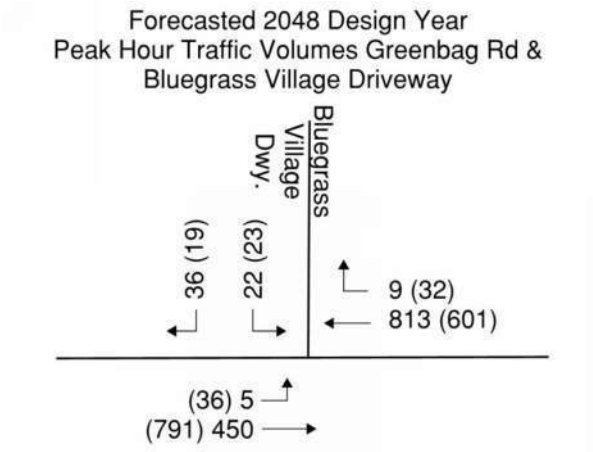
Development Component	Size	ITE Land Use	Weekday 24-Hour Traffic	Anticipated Site Generated Traffic Volume					
				AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Mobile Home Park	186 Units	240	1,019	14	58	72	68	42	110

- 2018 existing peak hour traffic volumes obtained from the *Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study*, dated Revised February 2019, prepared by Stahl Sheaffer, to project the existing Bluegrass Village Mobile Home Park distribution. The 2018 existing peak hour traffic volumes were obtained from Figure 3, from the Greenbag Road PIE Traffic Study, for the intersections of Greenbag Road with Mississippi Avenue and Greenbag Road with Dorsey Avenue/Kingwood Pike. The vehicle trip distribution at the intersection of Greenbag Road and Bluegrass Village Driveway was determined as follows:

Direction	AM Peak Hour		PM Peak Hour	
	Entering Distribution	Exiting Distribution	Entering Distribution	Exiting Distribution
To/From West Via Greenbag Road	36%	62%	53%	45%
To/From East Via Greenbag Road	64%	38%	47%	55%
TOTAL	100%	100%	100%	100%

- 2048 design year peak hour traffic volumes for the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike obtained from the aforementioned Greenbag Road PIE Traffic Study, to forecast 2048 design year volumes along Greenbag Road at Bluegrass Village Driveway.

Based on the information detailed above, the forecasted 2048 design year weekday AM and weekday PM peak hour traffic volumes at the intersection of Greenbag Road and Bluegrass Village Driveway was forecasted as follows:



Detailed calculations summarizing the Bluegrass Village Mobile Home Park trip generation and distribution, as well as the forecasted 2048 design year weekday AM and weekday PM peak hour traffic volumes are included in the enclosure provided with this correspondence.

Turn Lane Warrant Analysis

Stahl Sheaffer evaluated left turn and right turn lane warrants at the intersection of Greenbag Road and Bluegrass Village Driveway in accordance with the procedure in the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets* and in the National Cooperative Highway Report Program (NCHRP) Report 457.

Based on this evaluation, an eastbound left turn lane is warranted during the weekday PM peak hour and should provide a minimum of 125 feet of vehicular storage, exclusive of taper. A westbound right turn lane is not warranted.

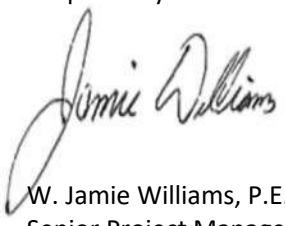
Copies of the turn lane warrant evaluation worksheets are included in the enclosure provided with this correspondence.

Conclusion

Based on the turn lane warrant evaluation for the intersection of Greenbag Road and Bluegrass Village Driveway, an eastbound left turn lane is warranted and should provide a minimum of 125 feet of vehicular storage, exclusive of taper.

This concludes Stahl Sheaffer's turn lane warrant study for the intersection of Greenbag Road and Bluegrass Village Driveway. If you have any questions, feel free to call or e-mail jwilliams@sse-llc.com.

Respectfully Submitted,



W. Jamie Williams, P.E.
Senior Project Manager, Stahl Sheaffer Engineering, LLC

ENCLOSURE

cc: (all via e-mail only)
18-141/Project File

STAHL SHEAFFER ENGINEERING

Enclosure

- Study Area – Aerial Image
- Bluegrass Village Trip Generation
- Bluegrass Village Trip Distribution
- 2048 Design Year Peak Hour Traffic Volumes – Greenbag Road and Bluegrass Village Driveway
- Turn Lane Warrant Worksheets

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Study Area – Aerial Image

- Based on aerial image, the existing Bluegrass Village Mobile Home Park includes 186 dwelling units.
- The aerial image is provided on the following page.


Schoolbus Dr
Dorsey Ln
Avalon St
Macomb St
Philip St
Dorsey Ave
Mountain View Manor
Green Bag Road
Kingwood Pike
81
857
Smith Dr
Clifford Ave
Fay Rd
Clyoe Ct
Dalton St
Jenkins Ln
Virginia Ct
40
7
18
9
33
14
14
13
21
17
Bluegrass Village Mobile Home Park
Legend:
10 - Number of Mobile Home Units Per Block (186 Total Mobile Home Units)
- Greenbag Road (CR 857) and Bluegrass Village Driveway - TWSC Intersection
Google Earth
© 2018 Europa Technologies
© 2018 Google
900 ft
N

STAHL SHEAFFER ENGINEERING

Bluegrass Village Trip Generation

- Vehicular Trip Generation
    - Vehicular trip generation for the Bluegrass Village Mobile Home Park was determined using the average rates and equations contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition*.
    - ITE Land Use 240, Mobile Home Park, was used to determine the anticipated trip generation for the existing 186 Mobile Home Park dwellings.
    - Anticipated trip generation for the existing Bluegrass Village Mobile Home Park is projected as follows:
        - Average Weekday Daily: 1,019 Vehicle Trips
        - Weekday AM Peak Hour: 72 Total Trips (14 Trips Entering and 58 Trips Exiting)
        - Weekday PM Peak Hour: 110 Total Trips (68 Trips Entering and 42 Trips Exiting)
    - Vehicular trip generation summary table and calculations are included on the following pages.

TABLE 1
TRIP GENERATION SUMMARY
Turn Lane Warrant Study
Greenbag Road (CR 857) and Bluegrass Village Driveway
City of Morgantown, Monongalia County, West Virginia

Development Component	Size	ITE Land Use	Weekday 24-Hour Traffic	Anticipated Site Generated Traffic Volume[(1)]					
				AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Mobile Home Park	186 Occupied Dwelling Units	240	1019	14	58	72	68	42	110

(1) Anticipated site generated traffic volumes based on data presented in the Institute of Transportation Engineers (ITE)*Trip Generation, 10th Edition* .

Source: Analysis by Stahl Sheaffer Engineering, LLC.

ITE LAND USE 240, MOBILE HOME PARK

Source: Institute of Transportation Engineers (ITE) *Trip Generation, 10th Edition* .

SETTING/LOCATION: General Urban/Suburban

WEEKDAY

SIZE:	X =	186	Occupied Dwelling Units								
EQ:	Ln(T) =	0.65	Ln	(X)	+	3.53					
	=	0.65	Ln	186.000	+	3.53	DIRECTIONAL DISTRIBUTION:				
	=	1019.161					50%	Enter /	50%	Exit	
	T =	1019	WEEKDAY TRIPS				510	Enter /	509	Exit	

AM PEAK HOUR OF ADJACENT STREET TRAFFIC

SIZE:	X =	186	Occupied Dwelling Units								
EQ:	T =	0.30	(X)	+	16.58						
	=	0.30	186	+	16.58	DIRECTIONAL DISTRIBUTION:					
	=	72.38				20%	Enter /	80%	Exit		
	T =	72	AM PK HR TRIPS			14	Enter /	58	Exit		

PM PEAK HOUR OF ADJACENT STREET TRAFFIC

SIZE:	X =	186	Occupied Dwelling Units								
RATE:	T =	0.58	(X)	+	2.38						
	=	0.58	186	+	2.38	DIRECTIONAL DISTRIBUTION:					
	=	110.26				62%	Enter /	38%	Exit		
	T =	110	PM PK HR TRIPS			68	Enter /	42	Exit		

Land Use: 240
Mobile Home Park

Description

A mobile home park generally consists of manufactured homes that are sited and installed on permanent foundations. It typically includes community facilities such as recreation rooms, swimming pools, and laundry facilities. Many mobile home parks restrict occupancy to adults.

Additional Data

The sites were surveyed in the 1980s and the 2000s in Delaware, Indiana, Oregon, and Virginia.

Source Numbers

155, 169, 252, 936

Mobile Home Park
(240)

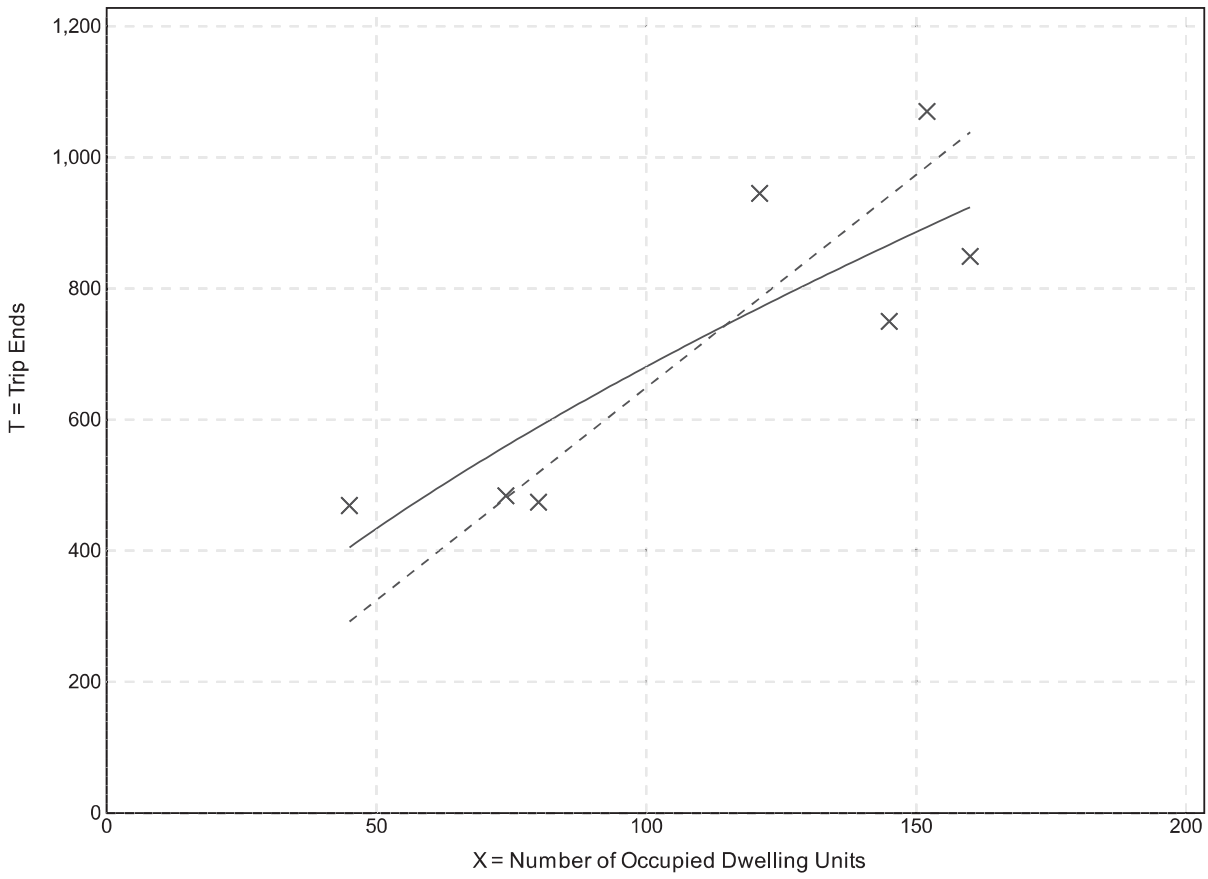
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 7
Avg. Num. of Occupied Dwelling Units: 111
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.49	5.17 - 10.42	1.48

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.65 Ln(X) + 3.53

R^2= 0.75

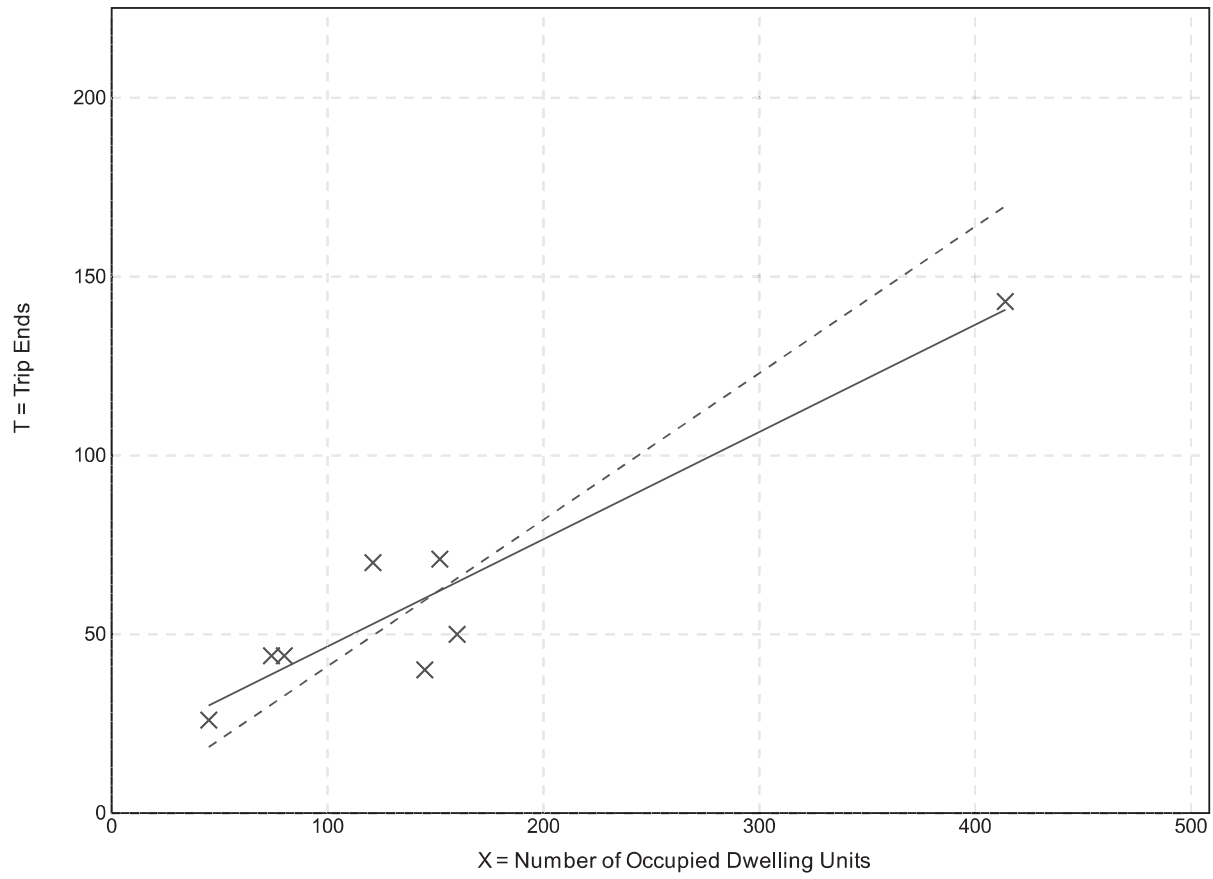
Mobile Home Park
(240)

Vehicle Trip Ends vs:	**Occupied Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	8
Avg. Num. of Occupied Dwelling Units:	149
Directional Distribution:	20% entering, 80% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.41	0.28 - 0.59	0.12

Data Plot and Equation



Fitted Curve Equation: T = 0.30(X) + 16.58

R^2= 0.89

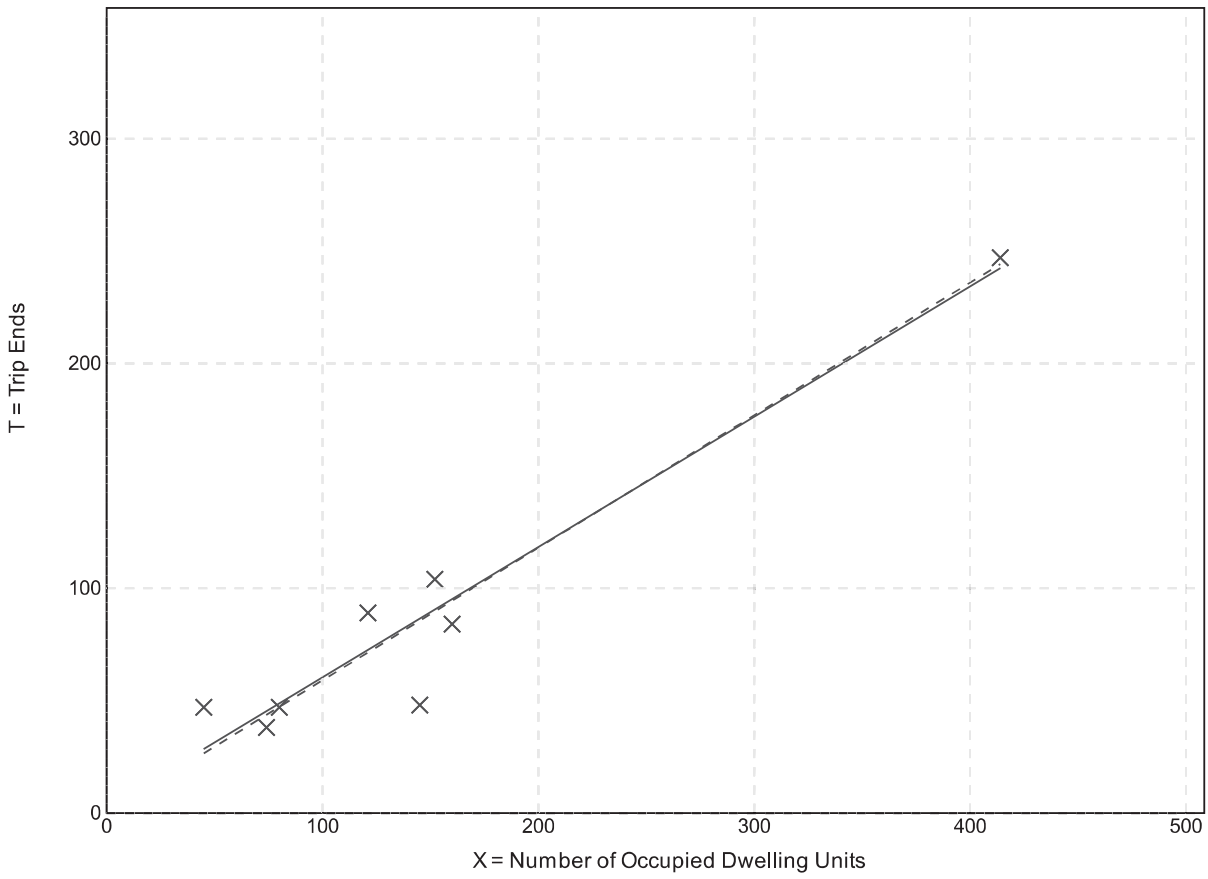
Mobile Home Park
(240)

Vehicle Trip Ends vs:	**Occupied Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	8
Avg. Num. of Occupied Dwelling Units:	149
Directional Distribution:	62% entering, 38% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.59	0.33 - 1.04	0.15

Data Plot and Equation



Mobile Home Park
(240)

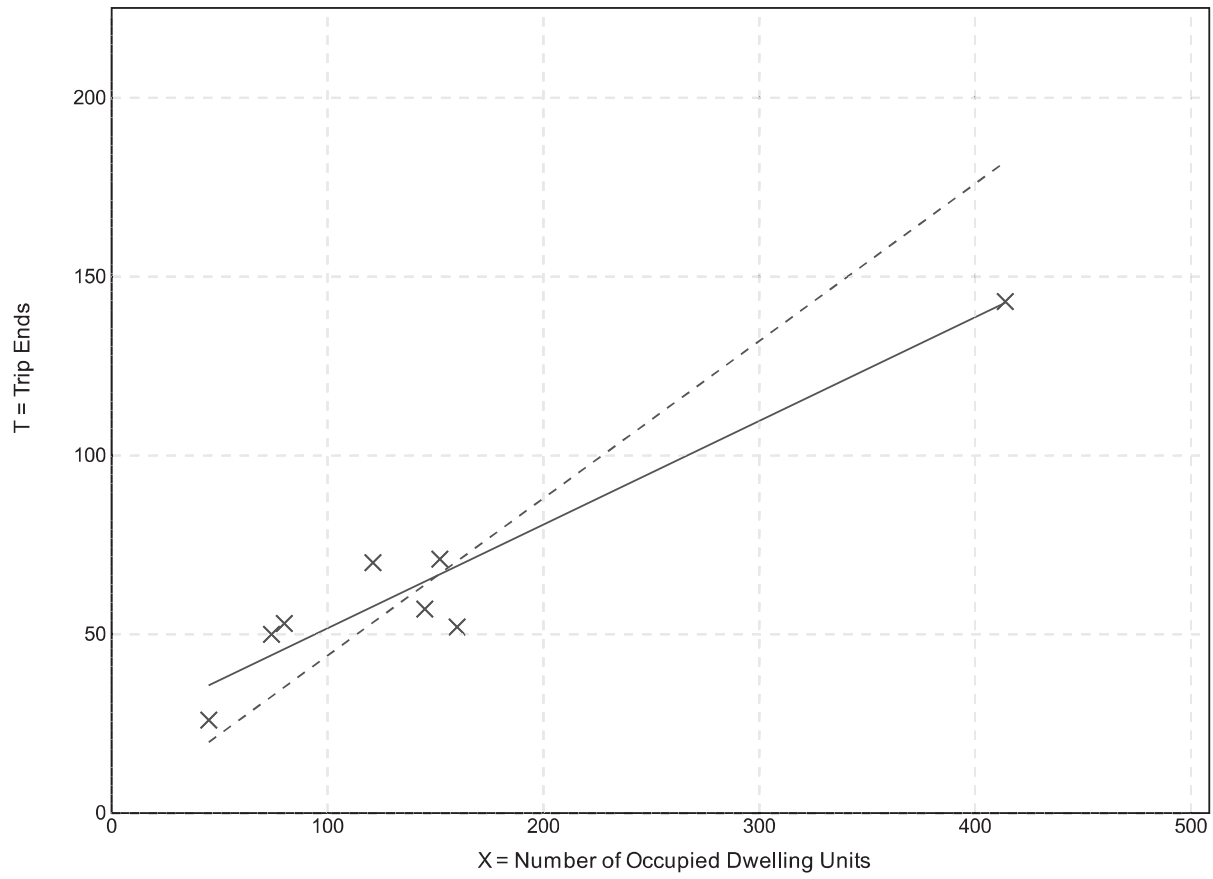
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 8
Avg. Num. of Occupied Dwelling Units: 149
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.33 - 0.68	0.13

Data Plot and Equation



Fitted Curve Equation: T = 0.29(X) + 22.62

R^2= 0.92

Mobile Home Park
(240)

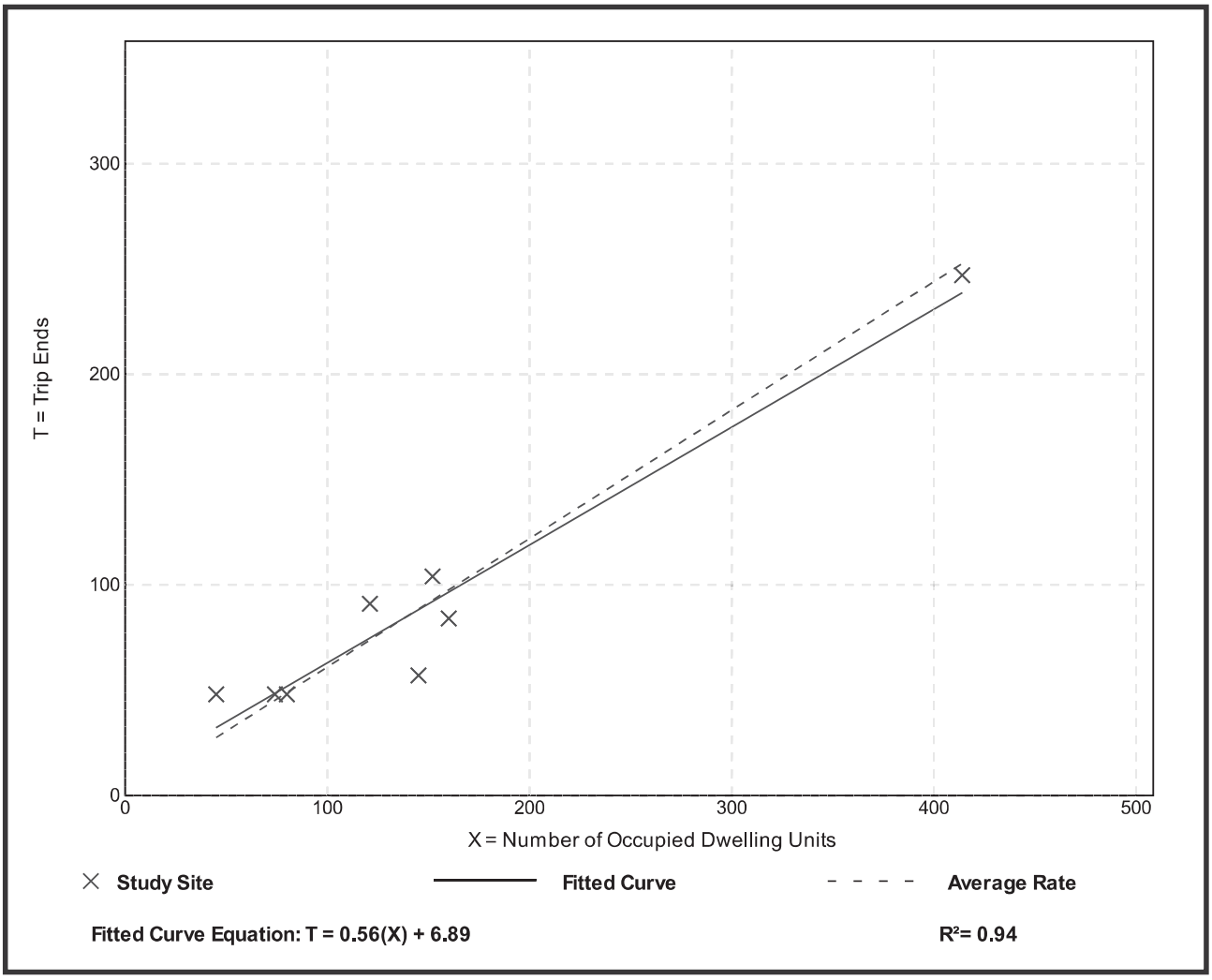
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 8
Avg. Num. of Occupied Dwelling Units: 149
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.39 - 1.07	0.14

Data Plot and Equation



Mobile Home Park
(240)

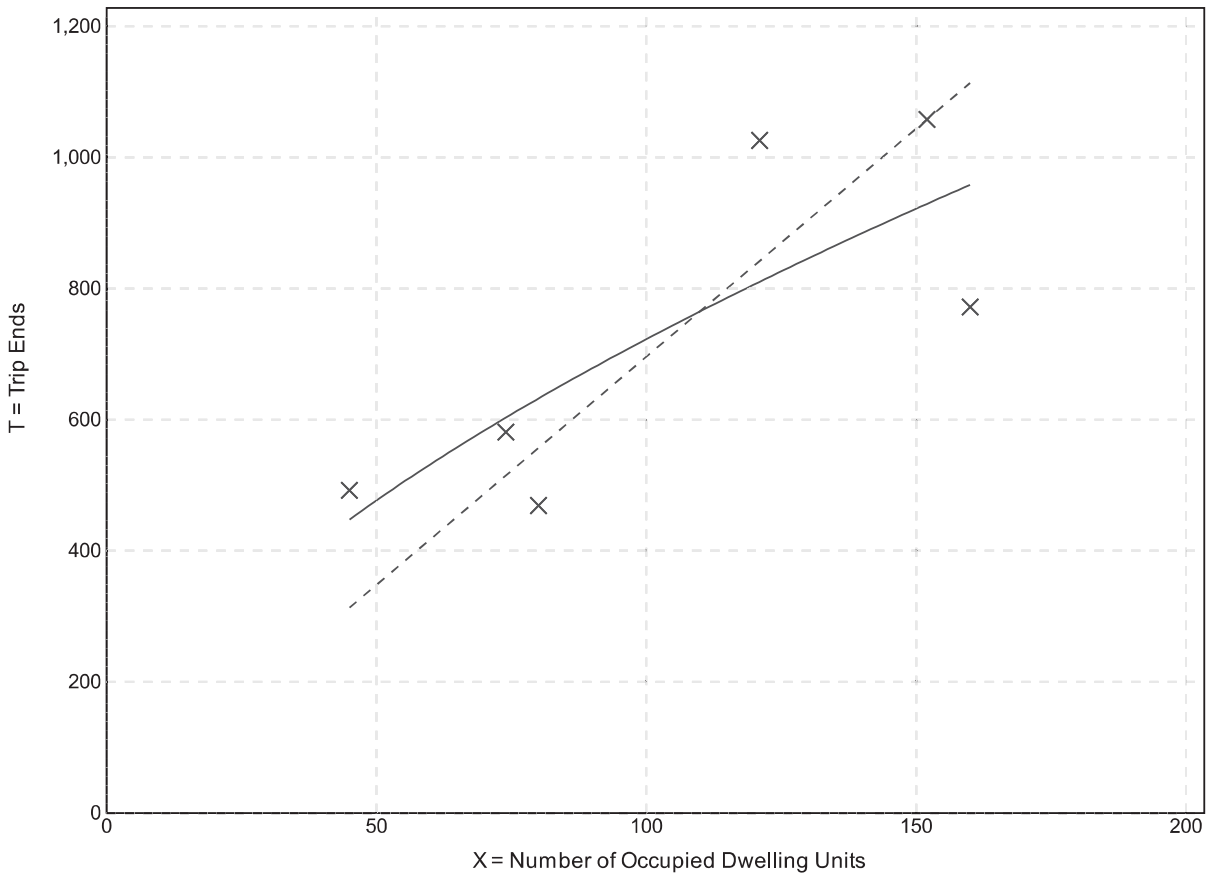
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Saturday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Occupied Dwelling Units: 105
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.96	4.83 - 10.93	1.89

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.60 Ln(X) + 3.82

R^2= 0.66

Mobile Home Park
(240)

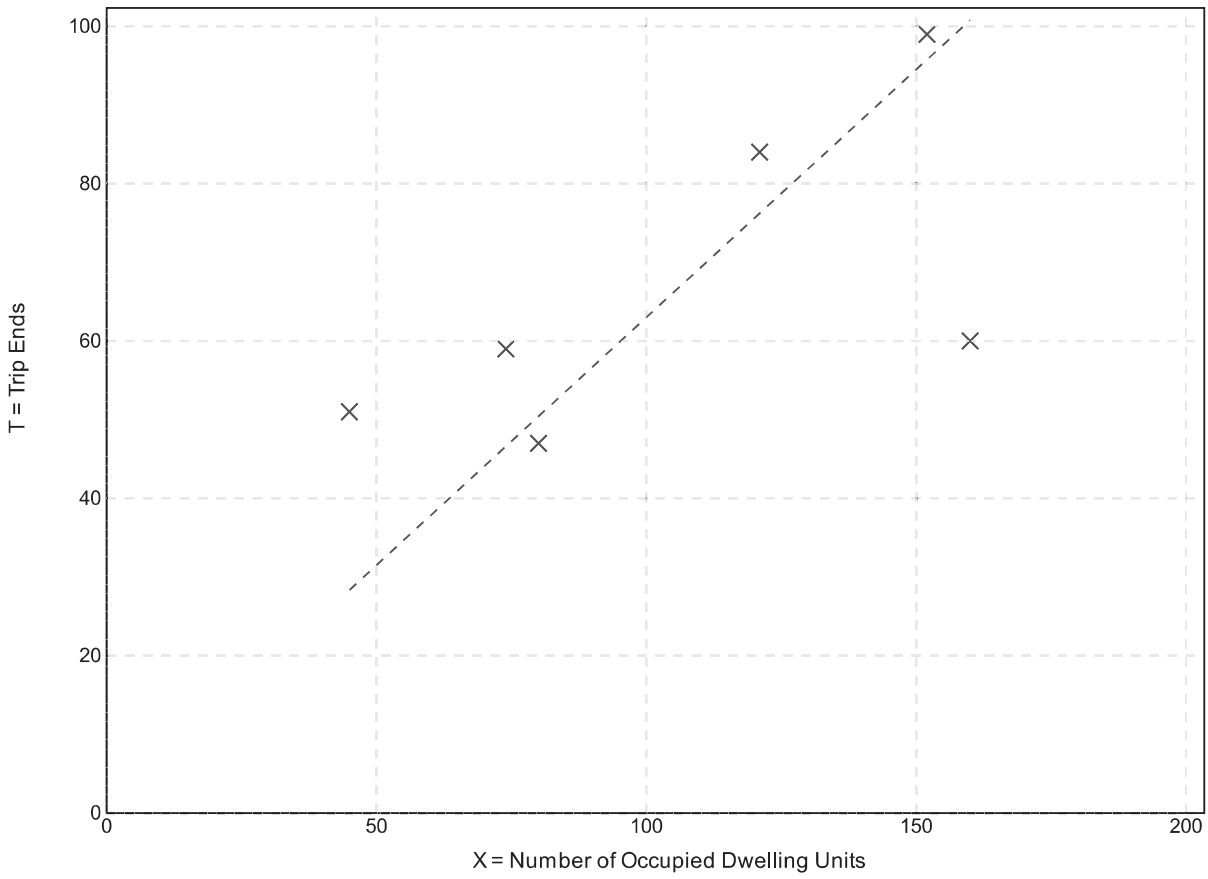
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Saturday, Peak Hour of Generator**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Occupied Dwelling Units: 105
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.63	0.38 - 1.13	0.22

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Mobile Home Park
(240)

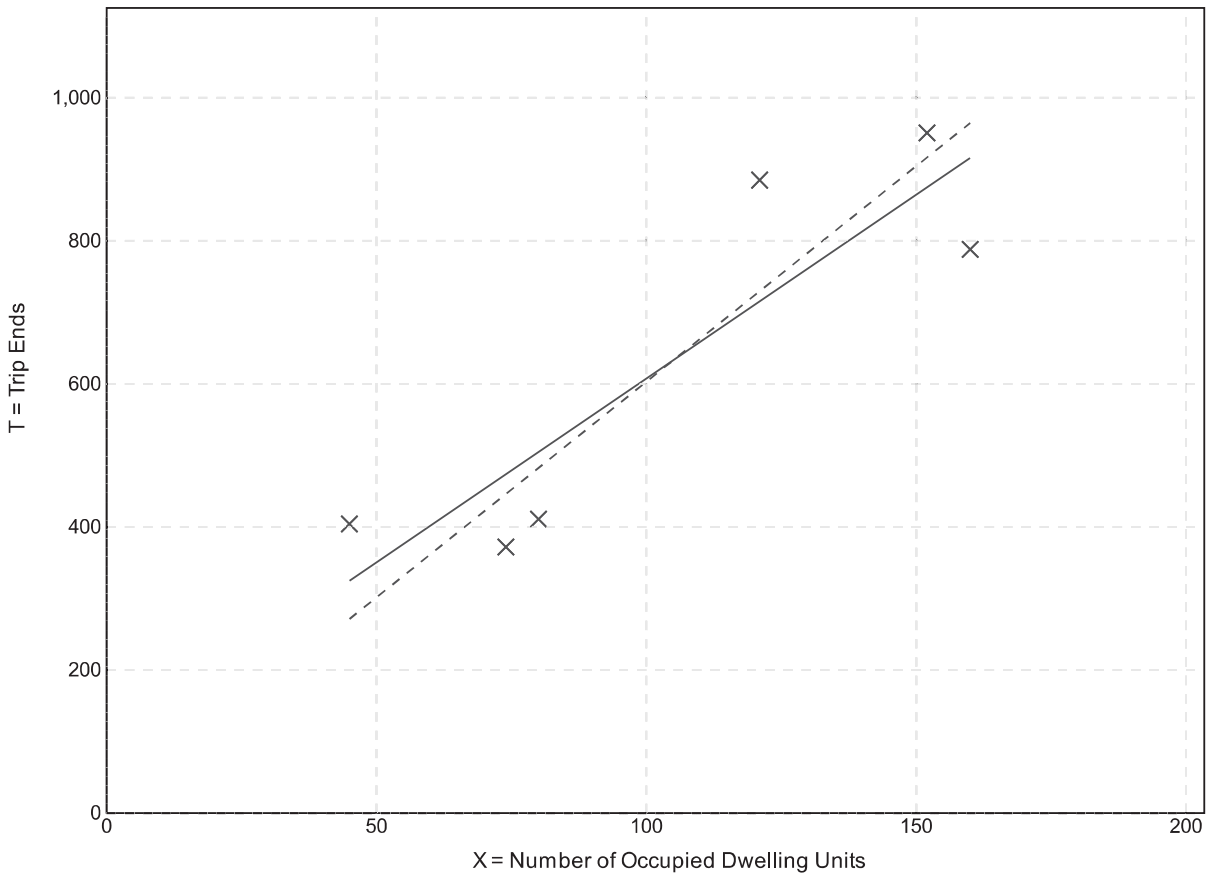
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Sunday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Occupied Dwelling Units: 105
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.03	4.93 - 8.98	1.33

Data Plot and Equation



Fitted Curve Equation: T = 5.14(X) + 93.67

R^2= 0.79

Mobile Home Park
(240)

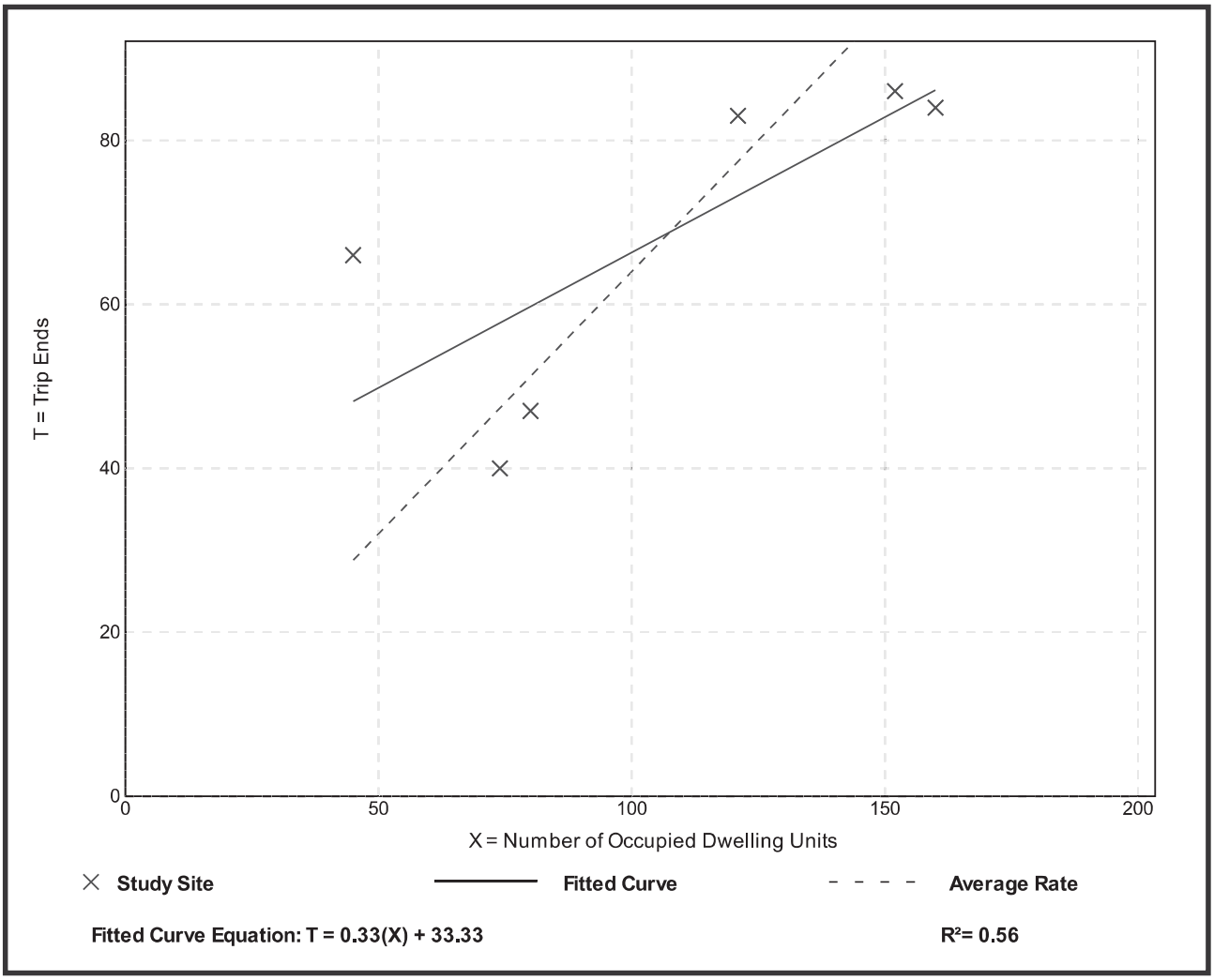
Vehicle Trip Ends vs: **Occupied Dwelling Units**
On a: **Sunday, Peak Hour of Generator**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Occupied Dwelling Units: 105
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.64	0.53 - 1.47	0.26

Data Plot and Equation



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Bluegrass Village Trip Distribution

- Vehicular Trip Distribution
    - Vehicular trip distribution for the Bluegrass Village Mobile Home Park was based on review of 2018 existing weekday AM and weekday PM peak hour traffic volumes at the following intersections:
        - Greenbag Road and Mississippi Avenue
        - Greenbag Road and Dorsey Avenue/Kingwood Pike
    - 2018 existing peak hour traffic volumes were obtained from Figure 3, provided in the *Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study*, dated Revised February 2019 and preprared by Stahl Sheaffer Engineering.
    - Vehiclar trip distribution at the intersection of Greenbag Road and Bluegrass Village Driveway was determined as follows:

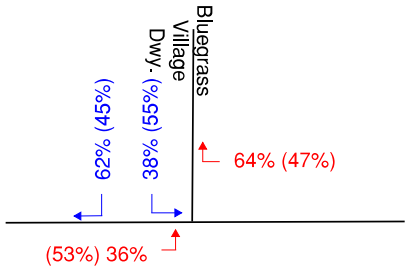
Direction	AM Peak Hour		PM Peak Hour	
	Entering Distribution	Exiting Distribution	Entering Distribution	Exiting Distribution
To/From West Via Greenbag Road	36%	62%	53%	45%
To/From East Via Greenbag Road	64%	38%	47%	55%
TOTAL	100%	100%	100%	100%

    - The vehicular trip generation for the Bluegrass Village Mobile Home Park was applied to the vehicular trip distirbution. The site trips entering and exiting Bluegrass Village was determined as follows:

Direction	AM Peak Hour		PM Peak Hour	
	Entering Site Trips	Exiting Site Trips	Entering Site Trips	Exiting Site Trips
To/From West Via Greenbag Road	5	36	36	19
To/From East Via Greenbag Road	9	22	32	23
TOTAL	14	58	68	42

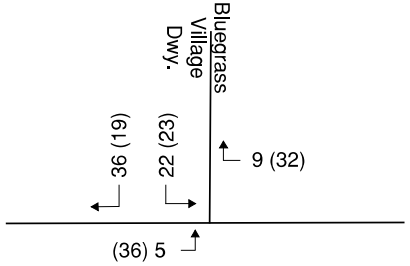
    - Vehicular trip distirbution detailed calculations are included on the following page.

Existing Trip Distribution Percentage
Bluegrass Village Mobile Home Park



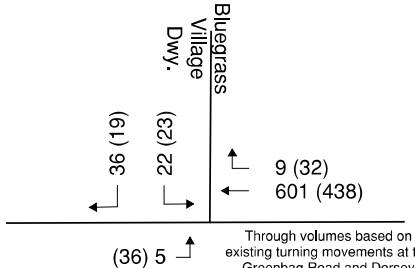
Based on existing peak hour traffic volumes per approaches detailed below.

Existing Site Trips
Bluegrass Village Mobile Home Park

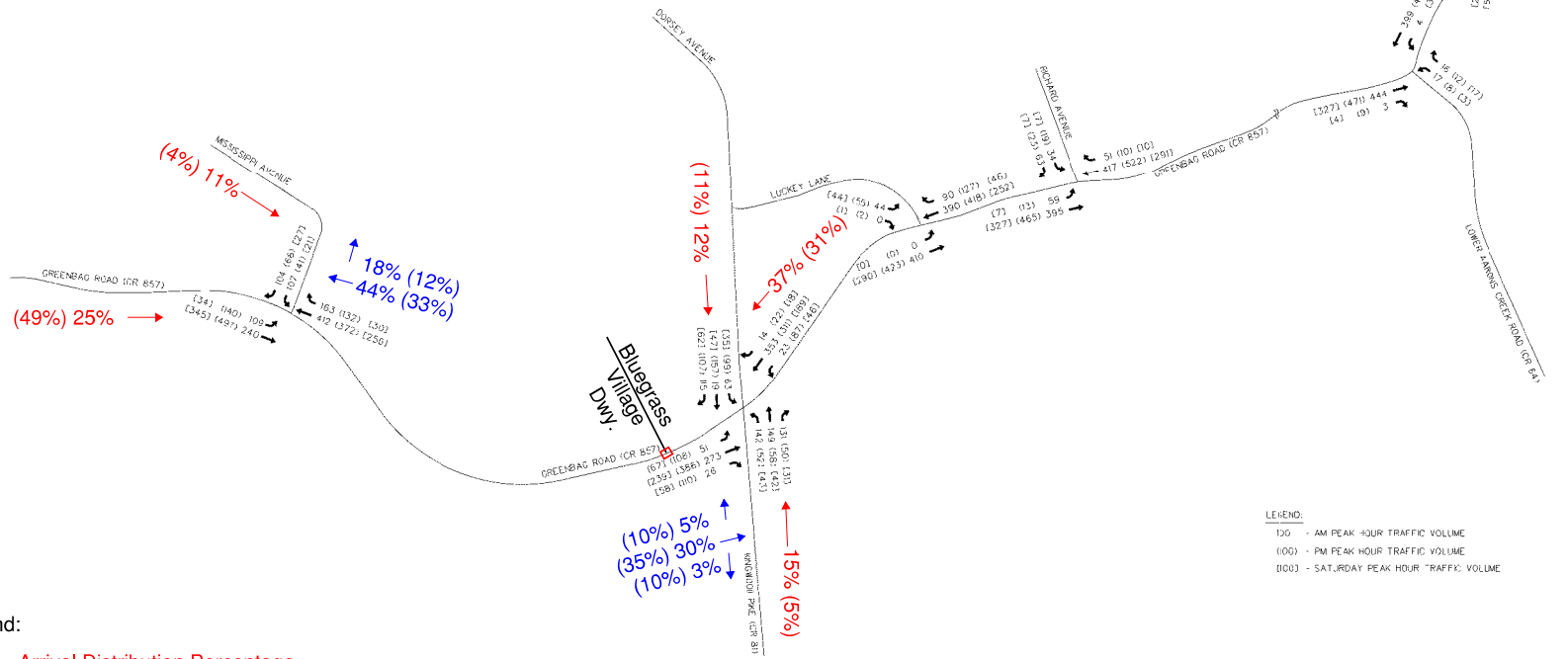


Applied Peak Hour Trip Generation to Existing Trip Distribution.

Existing Peak Hour Traffic Volumes
Greenbag Rd & Bluegrass Village Driveway



Through volumes based on existing turning movements at the Greenbag Road and Dorsey Avenue/Kingwood Pike intersection, minus Bluegrass Village Site Trips.



LEGEND:
100 - AM PEAK HOUR TRAFFIC VOLUME
(100) - PM PEAK HOUR TRAFFIC VOLUME
[100] - SATURDAY PEAK HOUR TRAFFIC VOLUME

Legend:

25% - Arrival Distribution Percentage
25% - Departure Distribution Percentage

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SEAL:

SURVEYOR
CADD MDS
DESIGNER
PROJ. MANAGER WJW
FILE:

DATE DESCRIPTION
REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

2018 EXISTING CONDITIONS PEAK HOUR TRAFFIC VOLUMES

PROJECT NO.
18-141

DATE
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 3

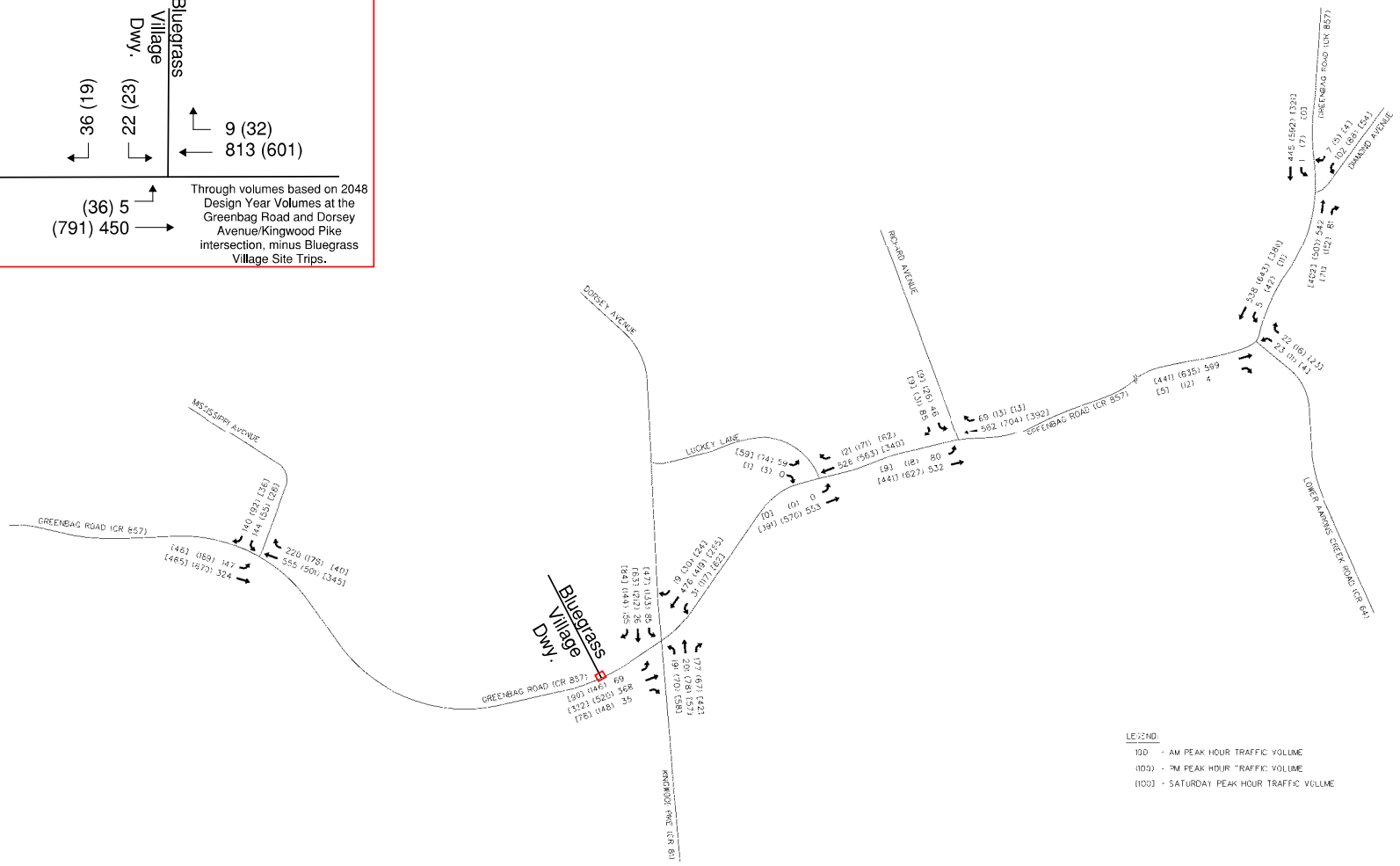
STAHL SHEAFFER ENGINEERING

2048 Design Year Peak Hour Traffic Volumes Greenbag Road and Bluegrass Village Driveway

- The 2048 design year peak hour traffic volumes at the intersection of Greenbag Road and Bluegrass Village Driveway were based on the following:
    - Forecasted site trips entering and exiting Bluegrass Village Driveway
    - 2048 design year peak hour traffic volumes at the intersection of Greenbag Road and Dorsey Avenue/Kingwood Pike, obtained from Figure 5, provided in the *Greenbag Road Preliminary Investigation and Engineering (PIE) Traffic Study*, dated Revised February 2019 and prepared by Stahl Sheaffer Engineering.
- 2048 design year peak hour traffic volumes details are included on the following page.

Forecasted 2048 Design Year
Peak Hour Traffic Volumes Greenbag Rd &
Bluegrass Village Driveway

Through volumes based on 2048 Design Year Volumes at the Greenbag Road and Dorsey Avenue/Kingwood Pike intersection, minus Bluegrass Village Site Trips.



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SEAL:

SURVEYOR
CADD MDS
DESIGNER
PROJ. MANAGER WJW
FILE:

DATE DESCRIPTION
REVISIONS

PROJECT NAME

GREENBAG ROAD (CR 857) PRELIMINARY INVESTIGATION AND ENGINEERING TRAFFIC STUDY

SHEET NAME

FORECASTED 2048 DESIGN YEAR PEAK HOUR TRAFFIC VOLUMES

PROJECT NO.
18-141

DATE
NOVEMBER 2018

SCALE	SHEET NO.
N.T.S.	FIG 5

STAHL SHEAFFER ENGINEERING

Turn Lane Warrant Worksheets

Project:		WVDOH Greenbag Road PIE Traffic Study		**Calculations:**	MDS
Intersection	**Greenbag Road (CR 857) & Bluegrass Village Driveway**				
Mainline	**Name:**	Greenbag Road (CR 857)		**Date:**	8/26/19
	Speed Limit (mph):	40		**Checked by:**	JAG
	Approach Direction:	EB		**Date:**	8/27/19
Side Street	**Name:**	Bluegrass Village Driveway		**Source: AASHTO, *A Policy on the Geometric Design of Highways and Streets*, 2011**	
	Speed Limit (mph):	25			

STAHL SHEAFFER ENGINEERING

Left-Turn Lane Warrant — EB Left Turn Lane — Greenbag Road (CR 857) & Bluegrass Village Driveway

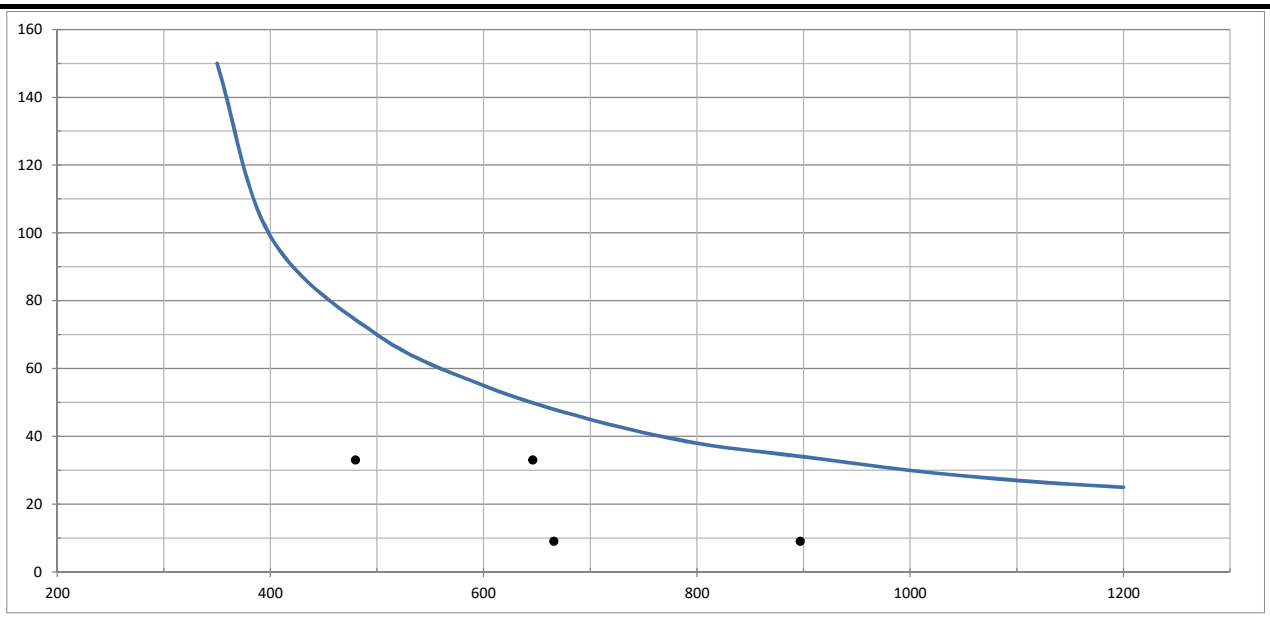
Warrant Satisfied? [ ] No [X] Yes 125-ft storage length"

SCENARIO			2018 Existing Conditions			2048 Design Year Conditions								
			AM Peak	PM Peak		AM Peak	PM Peak							
Traffic Factors	Speed, MPH		40	40		40	40							
	# of Signal Phases (U=Unsignalized)		U	U		U	U							
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40		40	40							
	Left Turn Volume	Left Turn Volume (vph)	5	36		5	36							
		% Heavy Vehiclees	2.0%	2.0%		2.0%	2.0%							
		Adjusted Volume (vph)	5	37		5	37							
	Advancing Volume	Total Volume (vph)	333	617		455	827							
		% Heavy Vehicles	7.8%	0.5%		7.8%	0.5%							
		Adjusted Volume (vph)	372	622		508	833							
		% Adjusted Left-Turns	1%	6%		1%	4%							
	Opposing Volume	Total Volume (vph)	610	470		822	633							
		% Heavy Vehicles	6.1%	1.4%		6.1%	1.4%							
		Adjusted Volume (vph)	666	480		897	646							
	Warranting advancing volume (VA)		729	429		677	416							
Warrant Satisfied?			**NO**	**YES**		**NO**	**YES**							
Calculated Storage (Feet)			**6**	**46**		**6**	**46**							
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			**--**	**125**		**--**	**125**							

Project:	**WVDOH Greenbag Road PIE Traffic Study**					**Calculations:**	MDS
Street	**Name:**	Greenbag Road				**Date:**	8/26/19
	Speed Limit (mph):	40				**Checked by:**	JAG
	Approach Direction:	WB	WBL	WBT	WBR	**Date:**	8/27/19
Intersecting St	**Name:**	Bluegrass Village Driveway				STAHL SHEAFFER ENGINEERING	
	Speed Limit (mph):	25					
Terrain Type (Level, Rolling, or Mountainous):		Rolling		**Factor:**	2.5		
Intersection:	**Greenbag Road & Bluegrass Village Driveway**					Source: NCHRP Report 457	

Right-Turn Lane Warrant (2 LANE ROAD, LESS THAN 45 MPH) **WB Right Turn Lane** **Greenbag Road & Bluegrass Village Driveway**

[X] Radius Only [ ] Full-Width Lane



SCENARIO			2018 Existing Conditions			2048 Design Year Conditions						
			AM Peak	PM Peak		AM Peak	PM Peak					
Traffic Factors	Speed, MPH		40	40		40	40					
	# of Signal Phases (U=Unsignalized)		U	U		U	U					
	Cycles/Hour	If unknown or Unsignalized = 40 cycles per hour (per TED 106-2)	40	40		40	40					
	Approach Total	Volume (vph)	610	470		822	633					
		% Heavy Vehicles	6.1%	1.4%		6.1%	1.4%					
		Adjusted Volume (vph)	666	480		897	646					
	Right Turns	Volume (vph)	9	32		9	32					
		% Heavy Vehicles	2.0%	2.0%		2.0%	2.0%					
		Adjusted Volume (vph)	9	33		9	33					
	Warranting Volume		48	75		34	50					
Warrant Satisfied?			**NO**	**NO**		**NO**	**NO**					
Calculated Storage (Feet)			--	--		--	--					
Required Storage (Feet) *Minimum Required is 125 Feet. Rounded to next 25 Feet. Per AASHTO.*			--	--		--	--					

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Morgantown, WV
Greenbag Rd & Dorsey Ave/Kingood Pk
Tuedsay, October 2, 2018
Location: 39.607314, -79.945062

Count Name: greenbag dorsey 2
Site Code:
Start Date: 10/02/2018

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Rd Northbound						Dorsey Rd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	12	44	7	0	0	63	5	106	4	0	0	115	30	32	20	0	0	82	11	4	32	0	0	47	307
7:15 AM	17	85	12	0	0	114	2	67	1	0	0	70	36	29	35	0	0	100	16	6	44	0	0	66	350
7:30 AM	11	46	5	0	0	62	11	61	5	0	0	77	32	48	39	0	0	119	13	6	18	0	0	37	295
7:45 AM	11	80	2	0	0	93	4	100	3	0	0	107	44	40	29	0	0	113	20	3	21	0	0	44	357
Total	51	255	26	0	0	332	22	334	13	0	0	369	142	149	123	0	0	414	60	19	115	0	0	194	1309
Approach %	15.4	76.8	7.8	0.0	-	-	6.0	90.5	3.5	0.0	-	-	34.3	36.0	29.7	0.0	-	-	30.9	9.8	59.3	0.0	-	-	-
Total %	3.9	19.5	2.0	0.0	-	25.4	1.7	25.5	1.0	0.0	-	28.2	10.8	11.4	9.4	0.0	-	31.6	4.6	1.5	8.8	0.0	-	14.8	-
PHF	0.750	0.750	0.542	0.000	-	0.728	0.500	0.788	0.650	0.000	-	0.802	0.807	0.776	0.788	0.000	-	0.870	0.750	0.792	0.653	0.000	-	0.735	0.917
Lights	47	238	21	0	-	306	21	312	13	0	-	346	141	148	122	0	-	411	60	19	102	0	-	181	1244
% Lights	92.2	93.3	80.8	-	-	92.2	95.5	93.4	100.0	-	-	93.8	99.3	99.3	99.2	-	-	99.3	100.0	100.0	88.7	-	-	93.3	95.0
Buses	3	10	5	0	-	18	0	6	0	0	-	6	0	1	0	0	-	1	0	0	13	0	-	13	38
% Buses	5.9	3.9	19.2	-	-	5.4	0.0	1.8	0.0	-	-	1.6	0.0	0.7	0.0	-	-	0.2	0.0	0.0	11.3	-	-	6.7	2.9
Trucks	1	7	0	0	-	8	1	16	0	0	-	17	1	0	1	0	-	2	0	0	0	0	-	0	27
% Trucks	2.0	2.7	0.0	-	-	2.4	4.5	4.8	0.0	-	-	4.6	0.7	0.0	0.8	-	-	0.5	0.0	0.0	0.0	-	-	0.0	2.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

EB Approach %HV:
=(18+8)/332
=0.0783
=7.83%

WB Approach %HV:
=(16+6+1+13)/(334+142+115)
=0.0609
=6.09%

Determination of Heavy Vehicle Percentages (%HV)
Greenbag Road at Bluegrass Village Driveway
PM Peak Hour

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Morgantown, PA
Greenbag Rd & Dosey Ave/Kingwood Pike
Tuesday, October 23, 2018
Location: 39.607314, -79.945062

Count Name: Greenbag Rd & Kingwood
Site Code:
Start Date: 10/23/2018

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Greenbag Rd Eastbound						Greenbag Rd Westbound						Kingwood Pike Northbound						Dorsey Ave Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	28	74	21	0	0	123	26	77	9	0	0	112	12	11	12	0	0	35	20	29	24	0	0	73	343
5:00 PM	18	98	33	0	0	149	25	80	1	0	0	106	13	24	10	0	0	47	22	45	35	0	0	102	404
5:15 PM	32	91	29	0	0	152	14	59	6	0	0	79	10	9	11	0	0	30	23	33	21	0	0	77	338
5:30 PM	30	83	27	0	0	140	12	59	3	0	0	74	17	14	11	0	0	42	24	50	27	0	0	101	357
Total	108	346	110	0	0	564	77	275	19	0	0	371	52	58	44	0	0	154	89	157	107	0	0	353	1442
Approach %	19.1	61.3	19.5	0.0	-	-	20.8	74.1	5.1	0.0	-	-	33.8	37.7	28.6	0.0	-	-	25.2	44.5	30.3	0.0	-	-	-
Total %	7.5	24.0	7.6	0.0	-	39.1	5.3	19.1	1.3	0.0	-	25.7	3.6	4.0	3.1	0.0	-	10.7	6.2	10.9	7.4	0.0	-	24.5	-
PHF	0.844	0.883	0.833	0.000	-	0.928	0.740	0.859	0.528	0.000	-	0.828	0.765	0.604	0.917	0.000	-	0.819	0.927	0.785	0.764	0.000	-	0.865	0.892
Lights	108	343	110	0	-	561	77	273	19	0	-	369	50	56	43	0	-	149	88	157	105	0	-	350	1429
% Lights	100.0	99.1	100.0	-	-	99.5	100.0	99.3	100.0	-	-	99.5	96.2	96.6	97.7	-	-	96.8	98.9	100.0	98.1	-	-	99.2	99.1
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	1	0	-	2	2
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.1	0.0	0.9	-	-	0.6	0.1
Trucks	0	3	0	0	-	3	0	2	0	0	-	2	2	2	1	0	-	5	0	0	1	0	-	1	11
% Trucks	0.0	0.9	0.0	-	-	0.5	0.0	0.7	0.0	-	-	0.5	3.8	3.4	2.3	-	-	3.2	0.0	0.0	0.9	-	-	0.3	0.8
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

EB Approach %HV:
=(3)/564
=0.00531
=0.53%

WB Approach %HV:
=(2+2+1+1)/(275+52+107)
=0.01382
=1.38%

Appendix C: Public Meeting Summary Report

INFORMATIONAL WORKSHOP

VIRTUAL PUBLIC MEETING REPORT

Greenbag Road Improvement Project
Monongalia County, WV

West Virginia Department of Transportation

Division of Highways

State Project U331-857-0.67

Federal Project STP-0857(019)D

March 2021

MARKOSKY

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Total Comments.....2

Comments Summary.....2-3

Attachments

Public Meeting Postcard
Notice of Extended Comment Period
Petition for Option G

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3	**Response to Comments**	170-579

GREENBAG ROAD IMPROVEMENT PROJECT, MONONGALIA COUNTY, WEST VIRGINIA

STATE PROJECT: U331-857-0.67, FEDERAL PROJECT: STP-0857(019)D

Summary of September 29, 2020 Virtual Public Meeting Informational Workshop and Comments

Summary of Meeting

The West Virginia Department of Transportation, Division of Highways (WVDOH) hosted a virtual public meeting informational workshop to present the FHWA approved Environmental Assessment (EA) and receive comments for the proposed Greenbag Road Improvement Project. The project proposes improvements and upgrades to the Greenbag Road (CR 857) corridor between Jonathan Lane and ¼ mile west of the intersection with Mississippi Street. Previously, an in-person public meeting was held at South Middle School on April 16, 2019 from 4 to 7 pm. A summary of that meeting is available as an attachment to the EA.

The second meeting was held virtually on the publicinput.com meeting platform on September 29, 2020 from 5:00 to 8:00 PM. The meeting was available through the website or through a call in number. The decision to hold the meeting virtually was in response to the COVID-19 pandemic.

WVDOH advertised the meeting in local papers and via a message board sign along Greenbag Road. Postcards were mailed to all meeting participants and commenters from the April 2019 meeting who provided a mailing address. The notice was emailed to meeting participants and commenters from the April 2019 meeting who provided an email address. The Morgantown Metropolitan Planning Organization and the City of Morgantown posted notices of the meeting online.

During the meeting, information concerning the project design, preferred alternative, and the environmental assessment was presented at 5, 6, and 7 pm. Additional information was available on the publicinput.com website including plan sheets, the EA, frequently asked questions from the April 2019 meeting, and a WVDOH-produced video about the use of roundabouts. A comment box was available on the site both during the meeting and during the public comment period after the meeting. In addition to the presentation, WVDOH and consultant representatives were available during the meeting time to answer questions that were submitted via phone to the voicemail box or through the comment box. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.

A 30-day comment period followed the public meeting, with comments due to WVDOH by October 29, 2020. Due to the number of comments received and the intensity of public involvement, FHWA extended the comment period for an additional 30 days, ending on November 30, 2020 for a total public comment period of 60 days.

Demographics

Of the individuals who commented both during the virtual meeting and during the comment period, there were a minimum of five hundred twenty-one (521) discrete commenters. One hundred forty four (144) comments were provided without any identifying information. Three hundred one (301) commenters listed a Morgantown address and an additional twenty-nine (29) were from elsewhere in WV. One hundred eighty (180) commenters did not provide any location information.

The WVDOH posted a survey question online asking how attendees had learned about the public meeting. Twenty-two individuals responded to the question and are listed below.

- Social media posts – 14
- Resident of the area – 3
- Email – 2
- Post card mailed from WVDOH – 2
- Website – 1

Total Comments

Nine hundred fifty-nine (959) comments were received by WVDOH. Of these, three hundred ninety-five (395) were submitted during the public meeting. The methods used to submit comments included:

- Website entry – 728
- Text message – 168
- Phone call/voicemail – 19
- Mailed letter/certified letter – 19
- Email – 19
- Correspondence with governor – 3
- Social media post – 2
- Petition – 1

Details for each comment are provided in Table 1. Comments and concerns are provided in Table 2. Where possible the comments are provided verbatim. Any comments that have been summarized are marked as such. Table 3 provides the response to comments.

Comments Summary

Of the total comments received, one hundred fifty-five (155 / 16.2%) were neutral to the preferred alternative design and included the answers to the WVDOH question about advertising, test comments from the presentation team, general questions, and requests for in-person meeting (15 comments). Fifty-three (53 / 5.5%) comments showed full support for the preferred alternative as presented. Seven hundred fifty-one comments (751 / 78.3%) expressed concerns and were not in support of the preferred alternative. Several common themes were identified throughout the

comments and are listed below. Many comments referred to more than one theme meaning percentages will exceed 100% when adding all comments.

- Roundabout (389 / 40.6%)
- Turn lanes (204 / 21.3%)
- Community garden/farmland (180 / 18.8%)
- Other alternatives (120 / 12.5%)
- Road maintenance (116 / 12.1%)
- Insufficient resource studies (124 / 12.9%)
- Safety (109 / 11.4%)
- Detour (100 / 10.4%)
- Virtual public meeting format (105 / 10.9%)
- Right-of-way concerns (93 / 9.7%)
- Large vehicles (92 / 9.6%)
- Bike/pedestrian (90 / 9.4%)
- Project not needed (65 / 6.8%)
- Schedule/budget (47 / 4.9%)
- Luckey Lane (24 / 2.5%)
- Mitigation (12 / 1.3%)
- Option G/petition* (8 / 0.8%)

*This number represents those who commented mentioning the petition.

A petition was created by local landowners to propose a fourth intersection option for the Greenbag Road and Dorsey Ave/Kingwood Pike intersection. The petition was signed by 1,115 individuals.

Table 1: Comment Details

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Pancake	Anthony				Facebook	4/17/2020	1
					Text Message	9/16/2020	2
					Text Message	9/16/2020	3
					Text Message	9/17/2020	4
					Text Message	9/17/2020	5
Kyle	Jonathan				Text Message	9/17/2020	6
					Text Message	9/17/2020	7
Kyle	Jonathan				Text Message	9/17/2020	8
					Text Message	9/17/2020	9
					Text Message	9/17/2020	10
					Text Message	9/17/2020	11
					Text Message	9/17/2020	12
Turner	Jennifer		Morgantown	WV	Text Message	9/17/2020	13
					Text Message	9/17/2020	14
					Text Message	9/17/2020	15
Kyle	Jonathan				Text Message	9/17/2020	16
					Text Message	9/17/2020	17
					Text Message	9/17/2020	18
					Text Message	9/17/2020	19
					Text Message	9/17/2020	20
					Text Message	9/17/2020	21
					Text Message	9/17/2020	22
					Text Message	9/17/2020	23
					Text Message	9/18/2020	24
					Text Message	9/18/2020	25
					Text Message	9/18/2020	26
					Text Message	9/18/2020	27
					Text Message	9/18/2020	28
					Text Message	9/18/2020	29
					Text Message	9/18/2020	30

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
					Text Message	9/18/2020	31
					Text Message	9/18/2020	32
					Text Message	9/18/2020	33
					Text Message	9/18/2020	34
					Text Message	9/18/2020	35
					Text Message	9/18/2020	36
					Text Message	9/18/2020	37
					Text Message	9/18/2020	38
					Text Message	9/18/2020	39
Clark	Carol				Text Message	9/20/2020	40
					Text Message	9/20/2020	41
O'Brien	Cindy		Morgantown	WV	Mailed Letter	9/21/2020	42
					Project Voicemail	9/22/2020	43
Jackson	Sharon		Morgantown	WV	Online Survey	9/22/2020	44
					Text Message	9/22/2020	45
					Text Message	9/23/2020	46
					Text Message	9/23/2020	47
Herget	Deborah		Morgantown	WV	Email	9/28/2020	48
Dean	Will				Email	9/29/2020	49
Cress-Esmay	Lisa				Email	9/29/2020	50
Dean	Will				Email	9/29/2020	51
Austin	Katie				Email	9/29/2020	52
Cantis	Daniel & Debby				Email	9/29/2020	53
Howell	Jerry				Email	9/29/2020	54
Mullens	Amanda				Email	9/29/2020	55
					Text Message	9/29/2020	56
Dawkins	Jay				Text Message	9/29/2020	57
Irvin	Amanda				Text Message	9/29/2020	58
Lazzell	Chris				Text Message	9/29/2020	59
Lazzell	Chris				Text Message	9/29/2020	60
Lazzell	Chris				Text Message	9/29/2020	61

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Lazzell	Chris				Text Message	9/29/2020	62
					Text Message	9/29/2020	63
Lazzell	Chris				Text Message	9/29/2020	64
Lazzell	Chris				Text Message	9/29/2020	65
					Text Message	9/29/2020	66
Lazzell	Chris				Text Message	9/29/2020	67
Kyle	Jonathan				Text Message	9/29/2020	68
Kyle	Jonathan				Text Message	9/29/2020	69
Kyle	Jonathan				Text Message	9/29/2020	70
Kyle	Jonathan				Text Message	9/29/2020	71
Kyle	Jonathan				Text Message	9/29/2020	72
Kyle	Jonathan				Text Message	9/29/2020	73
Kyle	Jonathan				Text Message	9/29/2020	74
Kyle	Jonathan				Text Message	9/29/2020	75
Kyle	Jonathan				Text Message	9/29/2020	76
Kyle	Jonathan				Text Message	9/29/2020	77
Kyle	Jonathan				Text Message	9/29/2020	78
Kyle	Jonathan				Text Message	9/29/2020	79
Kyle	Jonathan				Text Message	9/29/2020	80
Kyle	Jonathan				Text Message	9/29/2020	81
Kyle	Jonathan				Text Message	9/29/2020	82
Kyle	Jonathan				Text Message	9/29/2020	83
Kyle	Jonathan				Text Message	9/29/2020	84
Kyle	Jonathan				Text Message	9/29/2020	85
Kyle	Jonathan				Text Message	9/29/2020	86
Kyle	Jonathan				Text Message	9/29/2020	87
Kyle	Jonathan				Text Message	9/29/2020	88
Kyle	Jonathan				Text Message	9/29/2020	89
Kyle	Jonathan				Text Message	9/29/2020	90
Kyle	Jonathan				Text Message	9/29/2020	91
Kyle	Jonathan				Text Message	9/29/2020	92
Kyle	Jonathan				Text Message	9/29/2020	93

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Kyle	Jonathan				Text Message	9/29/2020	94
Kyle	Jonathan				Text Message	9/29/2020	95
Kyle	Jonathan				Text Message	9/29/2020	96
Kyle	Jonathan				Text Message	9/29/2020	97
Kyle	Jonathan				Text Message	9/29/2020	98
Kyle	Jonathan				Text Message	9/29/2020	99
Kyle	Jonathan				Text Message	9/29/2020	100
Lazzell	Chris				Text Message	9/29/2020	101
Vasquez	Tori				Text Message	9/29/2020	102
Kyle	Jonathan				Text Message	9/29/2020	103
Kyle	Jonathan				Text Message	9/29/2020	104
Kyle	Jonathan				Text Message	9/29/2020	105
Kyle	Jonathan				Text Message	9/29/2020	106
Vasquez	Tori				Text Message	9/29/2020	107
Kyle	Jonathan				Text Message	9/29/2020	108
Kyle	Jonathan				Text Message	9/29/2020	109
Kyle	Jonathan				Text Message	9/29/2020	110
Vasquez	Tori				Text Message	9/29/2020	111
Vasquez	Tori				Text Message	9/29/2020	112
Vasquez	Tori				Text Message	9/29/2020	113
Kyle	Jonathan				Text Message	9/29/2020	114
Kyle	Jonathan				Text Message	9/29/2020	115
Vasquez	Tori				Text Message	9/29/2020	116
Kyle	Jonathan				Text Message	9/29/2020	117
Kyle	Jonathan				Text Message	9/29/2020	118
Kyle	Jonathan				Text Message	9/29/2020	119
Kyle	Jonathan				Text Message	9/29/2020	120
Vasquez	Tori				Text Message	9/29/2020	121
Kyle	Jonathan				Text Message	9/29/2020	122
Kyle	Jonathan				Text Message	9/29/2020	123
Vasquez	Tori				Text Message	9/29/2020	124
Vasquez	Tori				Text Message	9/29/2020	125

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Vasquez	Tori				Text Message	9/29/2020	126
Kyle	Jonathan				Text Message	9/29/2020	127
Kyle	Jonathan				Text Message	9/29/2020	128
Kyle	Jonathan				Text Message	9/29/2020	129
Lazzell	Chris				Text Message	9/29/2020	130
Kyle	Jonathan				Text Message	9/29/2020	131
Kyle	Jonathan				Text Message	9/29/2020	132
Kyle	Jonathan				Text Message	9/29/2020	133
Kyle	Jonathan				Text Message	9/29/2020	134
Kyle	Jonathan				Text Message	9/29/2020	135
Vasquez	Tori				Text Message	9/29/2020	136
Vasquez	Tori				Text Message	9/29/2020	137
Vasquez	Tori				Text Message	9/29/2020	138
Kyle	Jonathan				Text Message	9/29/2020	139
Kyle	Jonathan				Text Message	9/29/2020	140
Kyle	Jonathan				Text Message	9/29/2020	141
Kyle	Jonathan				Text Message	9/29/2020	142
Vasquez	Tori				Text Message	9/29/2020	143
Kyle	Jonathan				Text Message	9/29/2020	144
Vasquez	Tori				Text Message	9/29/2020	145
Vasquez	Tori				Text Message	9/29/2020	146
Kyle	Jonathan				Text Message	9/29/2020	147
Kyle	Jonathan				Text Message	9/29/2020	148
Kyle	Jonathan				Text Message	9/29/2020	149
Kyle	Jonathan				Text Message	9/29/2020	150
Kyle	Jonathan				Text Message	9/29/2020	151
					Text Message	9/29/2020	152
					Text Message	9/29/2020	153
Kyle	Jonathan				Text Message	9/29/2020	154
Vasquez	Tori				Text Message	9/29/2020	155
Vasquez	Tori				Text Message	9/29/2020	156
Vasquez	Tori				Text Message	9/29/2020	157

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Kyle	Jonathan				Text Message	9/29/2020	158
Kyle	Jonathan				Text Message	9/29/2020	159
Kyle	Jonathan				Text Message	9/29/2020	160
Kyle	Jonathan				Text Message	9/29/2020	161
Kyle	Jonathan				Text Message	9/29/2020	162
Kyle	Jonathan				Text Message	9/29/2020	163
Kyle	Jonathan				Text Message	9/29/2020	164
Kyle	Jonathan				Text Message	9/29/2020	165
Vasquez	Tori				Text Message	9/29/2020	166
Kyle	Jonathan				Text Message	9/29/2020	167
Kyle	Jonathan				Text Message	9/29/2020	168
Kyle	Jonathan				Text Message	9/29/2020	169
Kyle	Jonathan				Text Message	9/29/2020	170
Kyle	Jonathan				Text Message	9/29/2020	171
Kyle	Jonathan				Text Message	9/29/2020	172
Kyle	Jonathan				Text Message	9/29/2020	173
Kyle	Jonathan				Text Message	9/29/2020	174
Kyle	Jonathan				Text Message	9/29/2020	175
					Text Message	9/29/2020	176
Vasquez	Tori				Text Message	9/29/2020	177
					Text Message	9/29/2020	178
					Text Message	9/29/2020	179
Vasquez	Tori				Text Message	9/29/2020	180
Vasquez	Tori				Project Voicemail	9/29/2020	181
Sizemore	Joshua C.		Charleston	WV	Online Survey	9/29/2020	182
Gerlach	Susan		Normalville	PA	Online Survey	9/29/2020	183
			Raleigh	NC	Online Survey	9/29/2020	184
Reed	Karen		Greensburg	PA	Online Survey	9/29/2020	185
Mullins	Sondra L.		Charleston	WV	Online Survey	9/29/2020	186
Cutlip	David		Latrobe	PA	Online Survey	9/29/2020	187
			Fairmont	WV	Online Survey	9/29/2020	188

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Fabry	David				Online Survey	9/29/2020	189
			Morgantown	WV	Online Survey	9/29/2020	190
Fabry	David				Online Survey	9/29/2020	191
Childs	Silas		Pittsburgh	PA	Online Survey	9/29/2020	192
	Glen		Morgantown	WV	Online Survey	9/29/2020	193
			Fairmont	WV	Online Survey	9/29/2020	194
			Fairmont	WV	Online Survey	9/29/2020	195
			Pittsburgh	PA	Online Survey	9/29/2020	196
Childs	Silas		Pittsburgh	PA	Online Survey	9/29/2020	197
			Fairmont	WV	Online Survey	9/29/2020	198
			Pittsburgh	PA	Online Survey	9/29/2020	199
					Project Voicemail	9/29/2020	200
Borkowski	Robert W		Morgantown	WV	Online Survey	9/29/2020	201
	Patrick		Morgantown	WV	Online Survey	9/29/2020	202
			Pittsburgh	PA	Online Survey	9/29/2020	203
			Morgantown	WV	Online Survey	9/29/2020	204
Charles	Victor		Houston	TX	Online Survey	9/29/2020	205
Charles	Victor		Houston	TX	Online Survey	9/29/2020	206
					Project Voicemail	9/29/2020	207
					Project Voicemail	9/29/2020	208
Childs	Silas		Pittsburgh	PA	Online Survey	9/29/2020	209
	Glen		Morgantown	WV	Online Survey	9/29/2020	210
			Morgantown	WV	Online Survey	9/29/2020	211
Charles	Victor		Houston	TX	Online Survey	9/29/2020	212
	Glen		Morgantown	WV	Online Survey	9/29/2020	213
Childs	Silas		Pittsburgh	PA	Online Survey	9/29/2020	214
			Morgantown	WV	Online Survey	9/29/2020	215
Austin	Katherine				Email	9/29/2020	216
					Online Survey	9/29/2020	217

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Charles	Victor		Houston	TX	Online Survey	9/29/2020	218
	Glen		Morgantown	WV	Online Survey	9/29/2020	219
Childs	Silas		Pittsburgh	PA	Online Survey	9/29/2020	220
					Online Survey	9/29/2020	221
	Glen		Morgantown	WV	Online Survey	9/29/2020	222
					Project Voicemail	9/29/2020	223
					Online Survey	9/29/2020	224
					Online Survey	9/29/2020	225
					Project Voicemail	9/29/2020	226
	Verna		Masontown	PA	Online Survey	9/29/2020	227
Santa Cantis	Dan		Morgantown	WV	Project Voicemail	9/29/2020	228
			Fairmont	WV	Online Survey	9/29/2020	229
					Online Survey	9/29/2020	230
	Glen		Morgantown	WV	Online Survey	9/29/2020	231
					Online Survey	9/29/2020	232
Metheny	Amy		Morgantown	WV	Online Survey	9/29/2020	233
					Online Survey	9/29/2020	234
					Online Survey	9/29/2020	235
					Online Survey	9/29/2020	236
Sneathen	Elizabeth M.		Fairmont	WV	Online Survey	9/29/2020	237
					Online Survey	9/29/2020	238
					Online Survey	9/29/2020	239
					Online Survey	9/29/2020	240
					Online Survey	9/29/2020	241
Richards	Garrett		Morgantown	WV	Online Survey	9/29/2020	242
					Online Survey	9/29/2020	243
					Online Survey	9/29/2020	244
					Online Survey	9/29/2020	245
					Online Survey	9/29/2020	246

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
					Online Survey	9/29/2020	247
Richards	Garrett		Morgantown	WV	Online Survey	9/29/2020	248
					Online Survey	9/29/2020	249
	Glen		Morgantown	WV	Online Survey	9/29/2020	250
Richards	Garrett		Morgantown	WV	Online Survey	9/29/2020	251
					Online Survey	9/29/2020	252
			Morgantown	WV	Online Survey	9/29/2020	253
	Glen		Morgantown	WV	Online Survey	9/29/2020	254
	Verna		Masontown	PA	Online Survey	9/29/2020	255
					Online Survey	9/29/2020	256
					Online Survey	9/29/2020	257
					Online Survey	9/29/2020	258
	Glen		Morgantown	WV	Online Survey	9/29/2020	259
Richards	Garrett		Morgantown	WV	Online Survey	9/29/2020	260
Richards	Garrett		Morgantown	WV	Online Survey	9/29/2020	261
					Online Survey	9/29/2020	262
					Online Survey	9/29/2020	263
					Online Survey	9/29/2020	264
					Online Survey	9/29/2020	265
			Elkridge	MD	Online Survey	9/29/2020	266
					Online Survey	9/29/2020	267
					Online Survey	9/29/2020	268
					Project Voicemail	9/29/2020	269
Metheny	Amy		Morgantown	WV	Online Survey	9/29/2020	270
					Online Survey	9/29/2020	271
					Online Survey	9/29/2020	272
Charles	Victor		Houston	TX	Online Survey	9/29/2020	273
					Online Survey	9/29/2020	274
Charles	Victor		Houston	TX	Online Survey	9/29/2020	275
Cummings	Traci		Charleston	WV	Online Survey	9/29/2020	276
					Online Survey	9/29/2020	277

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Schaupp	Adelheid		Morgantown	WV	Online Survey	9/29/2020	278
			Pittsburgh	PA	Online Survey	9/29/2020	279
					Online Survey	9/29/2020	280
	Richard		Morgantown	WV	Online Survey	9/29/2020	281
Howell	Jerry				Email	9/29/2020	282
					Online Survey	9/29/2020	283
Selin	Jenny				Online Survey	9/29/2020	284
					Online Survey	9/29/2020	285
	Glen		Morgantown	WV	Online Survey	9/29/2020	286
Charles	Victor		Houston	TX	Online Survey	9/29/2020	287
	Brandon				Online Survey	9/29/2020	288
			West Mifflin	PA	Online Survey	9/29/2020	289
			West Mifflin	PA	Online Survey	9/29/2020	290
			West Mifflin	PA	Online Survey	9/29/2020	291
			West Mifflin	PA	Online Survey	9/29/2020	292
			West Mifflin	PA	Online Survey	9/29/2020	293
			West Mifflin	PA	Online Survey	9/29/2020	294
			West Mifflin	PA	Online Survey	9/29/2020	295
			West Mifflin	PA	Online Survey	9/29/2020	296
			West Mifflin	PA	Online Survey	9/29/2020	297
			West Mifflin	PA	Online Survey	9/29/2020	298
	Patrick		Morgantown	WV	Online Survey	9/29/2020	299
			West Mifflin	PA	Online Survey	9/29/2020	300
			West Mifflin	PA	Online Survey	9/29/2020	301
Mullens	Amanda		Morgantown	WV	Online Survey	9/29/2020	302
B	Mel				Online Survey	9/29/2020	303
Downey	Kenneth		Morgantown	WV	Online Survey	9/29/2020	304
			West Mifflin	PA	Online Survey	9/29/2020	305
	Kenneth				Online Survey	9/29/2020	306
			West Mifflin	PA	Online Survey	9/29/2020	307
					Project Voicemail	9/29/2020	308

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
			West Mifflin	PA	Online Survey	9/29/2020	309
			West Mifflin	PA	Online Survey	9/29/2020	310
			West Mifflin	PA	Online Survey	9/29/2020	311
			West Mifflin	PA	Online Survey	9/29/2020	312
			West Mifflin	PA	Online Survey	9/29/2020	313
			West Mifflin	PA	Online Survey	9/29/2020	314
Charles	Victor		Houston	TX	Online Survey	9/29/2020	315
					Project Voicemail	9/29/2020	316
			West Mifflin	PA	Online Survey	9/29/2020	317
			West Mifflin	PA	Online Survey	9/29/2020	318
Charles	Victor		Houston	TX	Online Survey	9/29/2020	319
			West Mifflin	PA	Online Survey	9/29/2020	320
Charles	Victor		Houston	TX	Online Survey	9/29/2020	321
			West Mifflin	PA	Online Survey	9/29/2020	322
Charles	Victor		Houston	TX	Online Survey	9/29/2020	323
Charles	Victor		Houston	TX	Online Survey	9/29/2020	324
			West Mifflin	PA	Online Survey	9/29/2020	325
					Project Voicemail	9/29/2020	326
			West Mifflin	PA	Online Survey	9/29/2020	327
					Project Voicemail	9/29/2020	328
Hastings	Ted				Project Voicemail	9/29/2020	329
North Hastings	Marilyn				Online Survey	9/29/2020	330
Charles	Victor		Houston	TX	Online Survey	9/29/2020	331
			Fairmont	WV	Online Survey	9/29/2020	332
			West Mifflin	PA	Online Survey	9/29/2020	333
			West Mifflin	PA	Online Survey	9/29/2020	334
North Hastings	Marilyn				Online Survey	9/29/2020	335
			West Mifflin	PA	Online Survey	9/29/2020	336

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Charles	Victor		Houston	TX	Online Survey	9/29/2020	337
			West Mifflin	PA	Online Survey	9/29/2020	338
Charles	Victor		Houston	TX	Online Survey	9/29/2020	339
			West Mifflin	PA	Online Survey	9/29/2020	340
			West Mifflin	PA	Online Survey	9/29/2020	341
Hastings	Mary				Phone Call	9/30/2020	342
Duong	Kim		Morgantown	WV	Website Entry	9/30/2020	343
Straight	Cynthia	resident	Morgantown	WV	Website Entry	9/30/2020	344
Duong	Michael		Morgantown	WV	Website Entry	9/30/2020	345
Haas	Bridget		Morgantown	WV	Website Entry	9/30/2020	346
Dale	Chris		Morgantown	WV	Website Entry	9/30/2020	347
Hastings	Mary				Phone Call	9/30/2020	348
Childs	Silas		Westover	WV	Correspondence	9/30/2020	349
Hastings	Jenn				MMMPO Facebook Page	10/1/2020	350
Herget	Deborah		Morgantown	WV	Email	10/5/2020	351
Hastings	Mary				Email	10/5/2020	352
Nicholson	Justin				Email	10/14/2020	353
James	Joey	Conscious Harvest Cooperative	Morgantown	WV	Website Entry	10/16/2020	354
Hart	Mary Lee		Morgantown	WV	Website Entry	10/16/2020	355
Felice	Elizabeth			OR	Website Entry	10/16/2020	356
Hartley	William	None	Morgantown	WV	Website Entry	10/16/2020	357
Davis	Eeica		Morgantown	WV	Website Entry	10/16/2020	358
Snyder	Jonathan		Morgantown	WV	Website Entry	10/16/2020	359
Esmay	Lisa		Masontown	WV	Website Entry	10/16/2020	360
Melgar	Silvano			VA	Website Entry	10/16/2020	361
Hagedorn	Rachel	Hagedorn's Inc	Morgantown	WV	Website Entry	10/16/2020	362
Maupin	Maya				Website Entry	10/16/2020	363
Brown	Hali	Personal	Morgantown	WV	Website Entry	10/16/2020	364
Kyle	Patrick		Morgantown	WV	Website Entry	10/16/2020	365
Freeman	Brenda		Morgantown	WV	Website Entry	10/16/2020	366

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Thalman	Julie	Kingwood Pike Resident	Morgantown	WV	Website Entry	10/16/2020	367
Blosser	Jenna		Morgantown	WV	Website Entry	10/16/2020	368
Costello	Joanna	I do not want a round about	Morgantown	WV	Website Entry	10/16/2020	369
Hart	Sherry				Website Entry	10/16/2020	370
Lazzell	Walt	Public works	Morgantown	WV	Website Entry	10/16/2020	371
Michael	David				Website Entry	10/16/2020	372
Snider	Melissa		Morgantown	WV	Website Entry	10/16/2020	373
Hastings	Jennifer	Joy and Hemp LLC (the farm at risk of demolition)			Website Entry	10/16/2020	374
Dalton	Judith		Morgantown	WV	Website Entry	10/16/2020	375
Kessler	Kayla				Website Entry	10/16/2020	376
Woody	Christina				Website Entry	10/16/2020	377
Woody	Plummer				Website Entry	10/16/2020	378
Murray	Cheryl	Resident of Kingwood Pike.	Morgantown	WV	Website Entry	10/16/2020	379
Haas	Bridget				Website Entry	10/16/2020	380
Molisee	Eleanor	Against the toad Bout	Morgantown	WV	Website Entry	10/16/2020	381
Summers	Kylee				Website Entry	10/16/2020	382
Molisee	Carl	Against the roundBout	Morgantown	WV	Website Entry	10/16/2020	383
Stiles	Ms				Website Entry	10/16/2020	384
Stiles	Mr				Website Entry	10/16/2020	385
Nestor	Amanda				Website Entry	10/16/2020	386
Cooper	Corinna		Reedsville	WV	Website Entry	10/16/2020	387
Stiles	Melissa				Website Entry	10/16/2020	388
Stiles	Sean				Website Entry	10/16/2020	389
Jefferys	Becky				Website Entry	10/16/2020	390
Skipper	Robert	Cool springs fire dept	Morgantown	WV	Website Entry	10/16/2020	391
Lansberry	Louise		Grafton	WV	Website Entry	10/16/2020	392
Ault	Jenny			WV	Website Entry	10/16/2020	393
Mullens	Amanda	Resident of Kingwood Pike	Morgantown	WV	Website Entry	10/16/2020	394

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Smith-Teter	Virginia L		Terra Alta	WV	Website Entry	10/16/2020	395
Lambert	Cindy	Home owner	Morgantown	WV	Website Entry	10/16/2020	396
Summers	Kathy				Website Entry	10/16/2020	397
Price	Tammy				Website Entry	10/16/2020	398
Summers	Karen	No	Morgantown	WV	Website Entry	10/16/2020	399
Lewis	Greg	Security	Morgantown	WV	Website Entry	10/16/2020	400
Hilling	Sadie		Morgantown	WV	Website Entry	10/16/2020	401
Kessler	Bert				Website Entry	10/16/2020	402
Woody	Jennifer		Morgantown	WV	Website Entry	10/16/2020	403
Woody	Kenneth		Morgantown	WV	Website Entry	10/16/2020	404
Hart	Dorothy				Website Entry	10/16/2020	405
Dalton	Amy	Resident	Morgantown	WV	Website Entry	10/16/2020	406
Clark	Carol		Morgantown	WV	Website Entry	10/16/2020	407
Clark	Robert		Morgantown	WV	Website Entry	10/16/2020	408
Ledsome	April				Website Entry	10/16/2020	409
Snider	Dodie		Morgantown	WV	Website Entry	10/16/2020	410
Mcfadden	Marianne		Morgantown	WV	Website Entry	10/16/2020	411
Perkins	Brittany				Website Entry	10/16/2020	412
Huey	Vickie				Website Entry	10/16/2020	413
Stanley	Andrea		Reedsville	WV	Website Entry	10/16/2020	414
Charlton	Traci				Website Entry	10/16/2020	415
Christopher	Cora		Reedsville,	WV	Website Entry	10/16/2020	416
Nicholson	Lillie	Ssr	Morgantown	WV	Website Entry	10/16/2020	417
Lucas	Sierra		Morgantown	WV	Website Entry	10/16/2020	418
Blosser	Brenda		Morgantown	WV	Website Entry	10/16/2020	419
Woody	Christina		Morgantown	WV	Website Entry	10/16/2020	420
Woody	Plummer		Morgantown	WV	Website Entry	10/16/2020	421
Woody	Lulubelle		Morgantown	WV	Website Entry	10/16/2020	422
Kyle	Josh	Private		AZ	Website Entry	10/16/2020	423
Dawson	D				Website Entry	10/16/2020	424
Dawson	B				Website Entry	10/16/2020	425
Cordwell	Kim				Website Entry	10/16/2020	426

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Armentrout	Jackie		Morgantown	WV	Website Entry	10/16/2020	427
Weidman	Nancy		Morgantown	WV	Website Entry	10/16/2020	428
Rohr	Tabitha		Reedville	WV	Website Entry	10/16/2020	429
Reed	Ceda		Morgantown	WV	Website Entry	10/16/2020	430
Ornick	Wesley		Morgantown	WV	Website Entry	10/16/2020	431
Shafer	Lindsay	Wild & Wonderful Mermaids	Duck	WV	Website Entry	10/16/2020	432
Romito	Ariana		Morgantown	WV	Website Entry	10/16/2020	433
Eldred	Jessica		Morgantown	WV	Website Entry	10/16/2020	434
Marsh	Brandon		Morgantown	WV	Website Entry	10/16/2020	435
Naugle	Liv		Morgantown	WV	Website Entry	10/16/2020	436
Rice	Justin		Morgantown	WV	Website Entry	10/16/2020	437
Statler	Joe	Morgantown Monongalia Metropolitan Planning Organization	Morgantown	WV	Mailed Letter	10/16/2020	438
Hart	Sherry				Website Entry	10/16/2020	439
Snider	Melissa		Morgantown	WV	Website Entry	10/16/2020	440
Summers	Kathy				Website Entry	10/16/2020	441
Kyle	Josh	Private		AZ	Website Entry	10/16/2020	442
Hastings	Mary				Phone Call	10/19/2020	443
Hastings	Mary				Website Entry	10/19/2020	444
Kyle	Jonathan				Email	10/22/2020	445
Kirby	Patrick	Morgantown Land Reuse and Preservation Agency Green Belt Connections Committee	Morgantown	WV	Mailed Letter	10/27/2020	446
Muzzarelli	Emily	Office of the City Manager, Morgantown	Morgantown	WV	Mailed Letter	10/27/2020	447
Muzzarelli	Emily	Office of the City Manager, Morgantown	Morgantown	WV	Mailed Letter	10/27/2020	448
Statler	Joe				Mailed Letter	10/28/2020	449

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Strough	Jonell	Mon Valley Greenspace Coalition	Morgantown	WV	Mailed Letter	10/28/2020	450
Nicholson	Justin				Email	10/28/2020	451
Headley	Tanya				Email	10/28/2020	452
Hastings	Mary				Email	10/28/2020	453
Landenberger	Rick		Morgantown	WV	Email	10/29/2020	454
Albertazzie	Lyndsey				Website Entry	10/29/2020	455
Clark	Robert		Morgantown	WV	Email	10/30/2020	456
Hall	Diane				Phone Call	10/30/2020	457
Murray	Sasha				Phone Call	10/30/2020	458
Jackson	Sharon		Morgantown	WV	Website Entry	11/1/2020	459
Halliday Reynolds	Elizabeth	BlissBlissBliss	Morgantown	WV	Website Entry	11/1/2020	460
Ham	Jennifer		Morgantown	WV	Website Entry	11/1/2020	461
Amalraj	Rufina		Morgantown	WV	Website Entry	11/1/2020	462
Witt	Christine	NA	Morgantown	WV	Website Entry	11/1/2020	463
Hastings	Mary	Community Garden/ Hemp Farm – Mary Hastings	Morgantown	WV	Website Entry	11/1/2020	464
Strahin	Cheyanne		Morgantown	WV	Website Entry	11/1/2020	465
Perkins	Brittany				Website Entry	11/1/2020	466
Mullens	Amanda	Resident of the Kingwood Pike	Morgantown	WV	Website Entry	11/1/2020	467
Blaney	Mark		Morgantown	WV	Website Entry	11/1/2020	468
Perkins	Kelly				Website Entry	11/1/2020	469
Bolyard	Sheila		Morgantown	WV	Website Entry	11/1/2020	470
Woody	Jennifer		Morgantown	WV	Website Entry	11/1/2020	471
Woody	Kenneth		Morgantown	WV	Website Entry	11/1/2020	472
Hastings	Mary		Morgantown	WV	Website Entry	11/1/2020	473
Butcher	Anna	Citizen	Morgantown	WV	Website Entry	11/1/2020	474
Jackson	Sharon		Morgantown	WV	Website Entry	11/1/2020	475
Hosey	Addie				Website Entry	11/1/2020	476
Thompson	Cassidy		Morgantown	WV	Website Entry	11/1/2020	477

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Brewer	Michelle	Concerned Citizen	Morgantown	WV	Website Entry	11/1/2020	478
Nemecek	Shannon		Reedsville	WV	Website Entry	11/1/2020	479
Abildso	Christiaan		Morgantown	WV	Website Entry	11/1/2020	480
Blosser	Jenna				Website Entry	11/1/2020	481
Richards	Scheryll	None	Morgantown	WV	Website Entry	11/1/2020	482
Nicholson	Justin	N/a	Morgantown	WV	Website Entry	11/1/2020	483
Good	Gregory		Morgantown	WV	Website Entry	11/1/2020	484
Zizzi	Sam		Morgantown	WV	Website Entry	11/1/2020	485
Strough	Jonell	Self	Morgantown	WV	Website Entry	11/1/2020	486
Madison	Kathryn		Morgantown	WV	Website Entry	11/1/2020	487
Summers	Karen		Morgantown	WV	Website Entry	11/1/2020	488
Yeager	Wanda		Morgantown	WV	Website Entry	11/1/2020	489
Runfola	Steven		Morgantown	WV	Website Entry	11/1/2020	490
Sines	Matt		Morgantown	WV	Website Entry	11/1/2020	491
Pizatella	Jeanne	n/a	Morgantown	WV	Website Entry	11/1/2020	492
Powell	Jennifer	N/a	Morgantown	WV	Website Entry	11/1/2020	493
Dalton	Cheryl Mcmillen				Website Entry	11/1/2020	494
Nicholson	Linda				Website Entry	11/1/2020	495
Perkina	Brittany	Kingwood Pike Resident			Website Entry	11/1/2020	496
Hanlin	Cindy	piker			Website Entry	11/1/2020	497
Nicholson	Linda				Website Entry	11/1/2020	498
Lyon Barry	Melanie	Kingwood Pike Resident			Website Entry	11/1/2020	499
Dalton	Travis	Pike Resident			Website Entry	11/1/2020	500
Mullens	Amanda				Website Entry	11/1/2020	501
Kennedy Summers	Karen				Website Entry	11/1/2020	502
Sisler	William				Website Entry	11/1/2020	503
Friend	Diana				Website Entry	11/1/2020	504
Kennedy Summers	Karen				Website Entry	11/1/2020	505
Matheny Dalton	Judy	Pike Resident			Website Entry	11/1/2020	506
Hart	Danyell	Pike Resident			Website Entry	11/1/2020	507
Hart	Frank	pike resident			Website Entry	11/1/2020	508

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Woody	Christina				Website Entry	11/1/2020	509
Woody	Christina				Website Entry	11/1/2020	510
M Jones	Danette	pike resident			Website Entry	11/1/2020	511
Mcdonald	Anna				Website Entry	11/1/2020	512
Hart	Frank				Website Entry	11/1/2020	513
Yeager	Wanda				Website Entry	11/1/2020	514
Danley Bolyard	Sheila				Website Entry	11/1/2020	515
Kennedy Summers	Karen				Website Entry	11/1/2020	516
Satterfield Blosser	Brenda				Website Entry	11/1/2020	517
Murray	Cheryl				Website Entry	11/1/2020	518
Snider	Teresa				Website Entry	11/1/2020	519
Goodwin Hall	Diane				Website Entry	11/1/2020	520
L Householder	William				Website Entry	11/1/2020	521
Yeager	Wanda	pike resident			Website Entry	11/1/2020	522
Ridgway	Debbie	pike resident			Website Entry	11/1/2020	523
Lindsay	Marianne	None concerned citizen	Morgantoen	WV	Website Entry	11/1/2020	524
Kyle	Patrick				Website Entry	11/1/2020	525
Dalton	Carrie				Website Entry	11/1/2020	526
Hanlin	Cindy				Website Entry	11/1/2020	527
Dalton Saurborn	Judy				Website Entry	11/1/2020	528
Turner	Jim N Crystal				Website Entry	11/1/2020	529
Runfola	Steven		Morgantown	WV	Website Entry	11/1/2020	530
Mcdonald	Jessica	WV Land Stewardship Corp.; Morgantown Land Reuse and Preservation Agency	Morgantown	WV	Website Entry	11/1/2020	531
Carver	Angela	Resident of Prairie Village off Greenbag Road at Long Branch Drive	Morgantown	WV	Website Entry	11/1/2020	532
Glass	Marc	Local resident	Morgantown	WV	Website Entry	11/1/2020	533

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Glass	Marc	Downstream Strategies, LLC / DSS Adventures, LLC	Morgantown	WV	Website Entry	11/1/2020	534
Reger-Nash	Bill	Morgantown Pedestrian Safety Board, Director of WV Walks	Morgantown	WV	Website Entry	11/1/2020	535
Nash	Jan	Community Resident	Morgantown	WV	Website Entry	11/1/2020	536
Mccartney	Anita		Morgantown	WV	Website Entry	11/1/2020	537
Citizen	Concerned		Morgantown	WV	Website Entry	11/1/2020	538
Hastings	Mary		Morgantown	WV	Website Entry	11/1/2020	539
Vasquez	Tori		Morgantown	WV	Website Entry	11/1/2020	540
Hastings	Dewey	everyone	Morgantown	WV	Website Entry	11/1/2020	541
Laratta	Danielle	None			Website Entry	11/1/2020	542
P	Ashlee		Morgantown	WV	Website Entry	11/1/2020	543
Smith	Steven		Morgantown	WV	Website Entry	11/1/2020	544
Kelly	Aundrea		Morgantown	WV	Website Entry	11/1/2020	545
Epley Brown	Adrienne	Citizen	Morgantown	WV	Website Entry	11/1/2020	546
Perkins	Brittany				Website Entry	11/1/2020	547
Propst Brewer	Mickey				Website Entry	11/1/2020	548
A Wise	Sheila				Website Entry	11/1/2020	549
A Wise	Sheila				Website Entry	11/1/2020	550
Scott Smith	Sherry				Website Entry	11/1/2020	551
Householder	William				Website Entry	11/1/2020	552
Lawson	Denise				Website Entry	11/1/2020	553
Householder	William				Website Entry	11/1/2020	554
Thunder Tannenbaum	Rollin				Website Entry	11/1/2020	555
Gall	Mark				Website Entry	11/1/2020	556
Trichler	Scott				Website Entry	11/1/2020	557
Rodeheaver	Chrissy				Website Entry	11/1/2020	558
Fowler	Denise				Website Entry	11/1/2020	559
Ann	Gigi				Website Entry	11/1/2020	560
Butcher	Anna				Website Entry	11/1/2020	561

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Michael Barone	John				Website Entry	11/1/2020	562
Dalton	Cody				Website Entry	11/1/2020	563
Shaw	Linda				Website Entry	11/1/2020	564
Riivald	Juinelle				Website Entry	11/1/2020	565
Rodeheaver	Chrissy				Website Entry	11/1/2020	566
Rodeheaver	Chrissy				Website Entry	11/1/2020	567
Riivald	Juinelle				Website Entry	11/1/2020	568
Poling	Byron				Website Entry	11/1/2020	569
Householder	William				Website Entry	11/1/2020	570
Blankenship	Tabitha				Website Entry	11/1/2020	571
Landis	Brenda				Website Entry	11/1/2020	572
Campbell	John				Website Entry	11/1/2020	573
Mclaughlin	Chris				Website Entry	11/1/2020	574
Harshman	Mel				Website Entry	11/1/2020	575
Utt	Jeannie				Website Entry	11/1/2020	576
Fetty Clark	Carol				Website Entry	11/1/2020	577
Voithofer	Joey				Website Entry	11/1/2020	578
Campbell	John				Website Entry	11/1/2020	579
Householder	William				Website Entry	11/1/2020	580
Householder	William				Website Entry	11/1/2020	581
Campbell	John				Website Entry	11/1/2020	582
Gall	Mark				Website Entry	11/1/2020	583
Householder	William				Website Entry	11/1/2020	584
Utt	Jeannie				Website Entry	11/1/2020	585
Utt	Jeannie				Website Entry	11/1/2020	586
Snider	Teresa				Website Entry	11/1/2020	587
Householder	William				Website Entry	11/1/2020	588
Mills	Linda				Website Entry	11/1/2020	589
Howell	Verna				Website Entry	11/1/2020	590
Milam	Ila Jean				Website Entry	11/1/2020	591
Nester	Trina				Website Entry	11/1/2020	592
Mallek	David				Website Entry	11/1/2020	593

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Snider Howell	Verna				Website Entry	11/1/2020	594
Householder	William				Website Entry	11/1/2020	595
Hastings	Jenn				Website Entry	11/1/2020	596
Hartley	Erik				Website Entry	11/1/2020	597
Ymous	Anon				Website Entry	11/1/2020	598
Lee Nicholson Hart	Mary				Website Entry	11/1/2020	599
Shomo	J Mike				Website Entry	11/1/2020	600
Snyder	Bonnie				Website Entry	11/1/2020	601
Nicholson Hart	Mary Lee				Website Entry	11/1/2020	602
Hilling	Lynn				Website Entry	11/1/2020	603
Nebel	Stephen				Website Entry	11/1/2020	604
Nebel	Stephen				Website Entry	11/1/2020	605
Vanhorn Channel	Angie				Website Entry	11/1/2020	606
Deegidio	Eric				Website Entry	11/1/2020	607
Snyder	Bonnie				Website Entry	11/1/2020	608
Sue	Nikita				Website Entry	11/1/2020	609
Householder	William				Website Entry	11/1/2020	610
Antonelli	Marion				Website Entry	11/1/2020	611
Stout	Alex				Website Entry	11/1/2020	612
Born Wolfe	Candy				Website Entry	11/1/2020	613
Yoke Bolyard	Roseann				Website Entry	11/1/2020	614
Stewart-Taylor	Glenn Jay				Website Entry	11/1/2020	615
Bill	Hartley				Website Entry	11/1/2020	616
Wotring	Rocky				Website Entry	11/1/2020	617
Hanus	Cheryl				Website Entry	11/1/2020	618
Stump	Tori				Website Entry	11/1/2020	619
Hankey	Frank				Website Entry	11/1/2020	620
Maxon Mullenax	Shelley				Website Entry	11/1/2020	621
Campbell	Julie				Website Entry	11/1/2020	622
Nebel	Stephen				Website Entry	11/1/2020	623
Riffle	Mary				Website Entry	11/1/2020	624
Summers	Kathy				Website Entry	11/1/2020	625

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Durig	Scott				Website Entry	11/1/2020	626
Williamson	Renee				Website Entry	11/1/2020	627
Calvert Miller	Kristen				Website Entry	11/1/2020	628
Durig	Scott				Website Entry	11/1/2020	629
James	Joey				Website Entry	11/1/2020	630
Witt	Tom	Retired	Morgantown		Website Entry	11/1/2020	631
Hastings	Mary				Website Entry	11/1/2020	632
Ochs	Ashleigh				Website Entry	11/1/2020	633
Stilwell	Nathan		Morgantown	WV	Website Entry	11/1/2020	634
Tinnell	Shannon	Morgantown Historic Landmarks Commission	Morgantown	WV	Website Entry	11/1/2020	635
Hunt	Paula		Morgantown	WV	Website Entry	11/1/2020	636
Hastings	Mary		Morgantown	WV	Website Entry	11/1/2020	637
Ferrell	Chris	Cobun Ridge Property Owners	Morgantown	WV	Website Entry	11/1/2020	638
Smith	Sarah	We Run	Morgantown	WV	Website Entry	11/1/2020	639
Rota	Beth		Morgantown	WV	Website Entry	11/1/2020	640
Mclaughlin	Maura		Morgantown	WV	Website Entry	11/1/2020	641
Newcome	Marilyn	Bikeboard Member	Morgantown	WV	Website Entry	11/1/2020	642
Ensign	Todd		Morgantown	WV	Website Entry	11/1/2020	643
Rohrbaugh	Jody				Website Entry	11/1/2020	644
Summerlin	Jamie		Morgantown	WV	Website Entry	11/1/2020	645
Cope	Keisha				Website Entry	11/1/2020	646
Dice	Cass				Website Entry	11/1/2020	647
Corbett	Renee				Website Entry	11/1/2020	648
Collins	Dianna				Website Entry	11/1/2020	649
Waugh	Stephany				Website Entry	11/1/2020	650
Dakota	Brody				Website Entry	11/1/2020	651
On The Pike	Everyone				Website Entry	11/1/2020	652
Frash	Josh	Morgantown Resident	Westover	WV	Website Entry	11/1/2020	653
Shepard	Mark		Morgantown	WV	Website Entry	11/1/2020	654
Matlick	Christina		Morgantown	WV	Website Entry	11/1/2020	655

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Persons	Anonymous				Website Entry	11/1/2020	656
Rigden	Keith				Website Entry	11/1/2020	657
Nebel	Stephen				Website Entry	11/1/2020	658
Phillips	Chris				Website Entry	11/1/2020	659
Snider	Tina				Website Entry	11/1/2020	660
Benson Bailey	Becky				Website Entry	11/1/2020	661
Barr	Michael	Conscious Harvest Cooperative	Morgantown	WV	Website Entry	11/1/2020	662
Galusky	Parrish				Website Entry	11/1/2020	663
Berkshire	Charley				Website Entry	11/1/2020	664
Butcher	Tracey				Website Entry	11/1/2020	665
Arnold	Christopher				Website Entry	11/1/2020	666
Broadstock	Vanette				Website Entry	11/1/2020	667
Joyce	Danielle				Website Entry	11/1/2020	668
Lynn	Erin				Website Entry	11/1/2020	669
Panrell	Guy				Website Entry	11/1/2020	670
Burdette	Ashley				Website Entry	11/1/2020	671
Komondor	Shawn	Tong Thai Fresh, LLC	Morgantown	WV	Website Entry	11/1/2020	672
Saaid	Nawfal	individual	Morgantown	WV	Website Entry	11/1/2020	673
Knabenshue	Traci		Morgantown	WV	Website Entry	11/1/2020	674
Hastings	Mary		Morgantown	WV	Website Entry	11/1/2020	675
Harvest Cooperative	Conscious	Health Right & Friendship House	Morgantown	WV	Website Entry	11/1/2020	676
Hastings	Dewey		Morgantown	WV	Website Entry	11/1/2020	677
Hastings	Ted	Conscious Harvest Cooperative 501©(3)	Morgantown	WV	Mailed Letter	11/1/2020	678
Maust	Dennis	Prairie Village Homeowners Association (but I'm submitting as an individual resident of the county)	Morgantown	WV	Website Entry	11/1/2020	679

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Hastings	Ted	Conscious Harvest Cooperative 501(c)(3)	Morgantown	WV	Mailed Letter	11/1/2020	680
Hastings	Ted	Conscious Harvest Cooperative 501(c)(3)	Morgantown	WV	Mailed Letter	11/1/2020	681
Hastings	Dewey	Farmer	Morgantown	WV	Website Entry	11/1/2020	682
Hastings	Ted	Farmer	Morgantown	WV	Website Entry	11/1/2020	683
Hastings	Ted	Farmer	Morgantown	WV	Website Entry	11/1/2020	684
Hastings	Dewey	Farmer	Morgantown	WV	Website Entry	11/1/2020	685
Hastings	Ted	Joy and Hemp Universal, LLC	Morgantown	WV	Website Entry	11/1/2020	686
Hastings	Ted	Joy and Hemp Universal, LLC	Morgantown	WV	Website Entry	11/1/2020	687
Hart	Mary		Morgantown	WV	Website Entry	11/1/2020	688
Bolyard	Cristina	N/a	Morgantown	WV	Website Entry	11/1/2020	689
Murray	Nathan		Morgantown	WV	Website Entry	11/1/2020	690
Tarnowsky	Christopher		Morgantown		Website Entry	11/1/2020	691
Sickles	Judy	None	Morgantown	WV	Website Entry	11/1/2020	692
Kelley	Melissa		Kingwood	WV	Website Entry	11/1/2020	693
Pavlovic	Dwight		Morgantown	WV	Website Entry	11/1/2020	694
Harding	Meghan		Morgantown	WV	Website Entry	11/1/2020	695
Dailey	Barbara		Reedsville	WV	Website Entry	11/1/2020	696
Zielinski	Vicki	None	Morgantown	WV	Website Entry	11/1/2020	697
Callahan	Susan	Resident	Morgantown	WV	Website Entry	11/1/2020	698
Maust	Amy		Morgantown	WV	Website Entry	11/1/2020	699
O'Shields	Kelsey		Morgantown	WV	Website Entry	11/1/2020	700
Reed	Sara				Website Entry	11/1/2020	701
Smith	Joshua	Patria village community	Morgantown	WV	Website Entry	11/1/2020	702
Williamson	Brenna		Morgantown	WV	Website Entry	11/1/2020	703
Kennedy	Shana		Morgantown	WV	Website Entry	11/1/2020	704
Newman	Josh				Website Entry	11/1/2020	705
Tennant	Amanda		Morgantown	WV	Website Entry	11/1/2020	706

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Jones	Tara		Morgantown	WV	Website Entry	11/1/2020	707
Alvarez	Holly		Morgantown	WV	Website Entry	11/1/2020	708
Snyder	Michelle		Morgantown	WV	Website Entry	11/1/2020	709
Mollohan	Mellissa		Morgantown	WV	Website Entry	11/1/2020	710
Marsh	Erica		Morgantown	WV	Website Entry	11/1/2020	711
Woody	Christina		Morgantown	WV	Website Entry	11/1/2020	712
Gillum	Jennifer		Morgantown	WV	Website Entry	11/1/2020	713
Whetsell	Christy		Morgantown	WV	Website Entry	11/1/2020	714
Mulkeen	Owen		Morgantown	WV	Website Entry	11/1/2020	715
Habuda	Amy				Website Entry	11/1/2020	716
Saaid	Enass		Morgantown	WV	Website Entry	11/1/2020	717
Milliron	Stephanie		Morgantown	WV	Website Entry	11/1/2020	718
Deegidio	Elizabeth	Community member	Morgantown	WV	Website Entry	11/1/2020	719
Lazzell	Christopher	Emotional-Therapy.com	Morgantown	WV	Website Entry	11/1/2020	720
Wolfe	Candy		Reedsville	WV	Website Entry	11/1/2020	721
Selin	Jennifer	MMPO, city of morgantown	Morgantown	WV	Website Entry	11/1/2020	722
Hughes	S		Morgantown	WV	Website Entry	11/1/2020	723
Dalton	Jacque		Morgantown	WV	Website Entry	11/1/2020	724
Baldwin	Owen				Website Entry	11/1/2020	725
Debastiani	Anthony		Morgantown	WV	Website Entry	11/1/2020	726
Bacorn	Amy	Resident	Morgantown	WV	Website Entry	11/1/2020	727
Bunch	Samuel	Light Plasma	Morgantown	WV	Website Entry	11/1/2020	728
Luckini	Mary Helen				Website Entry	11/1/2020	729
Summers	Susan	Greenbag road round about	Morgantown	WV	Website Entry	11/1/2020	730
Fetty	Rachel	Morgantown City Council	Morgantown	WV	Website Entry	11/1/2020	731
Cutright	Va	No round about	Morgantown	WV	Website Entry	11/1/2020	732
Cruz	Orlando	Meditation Mountain/ Dancing With The Elements	Morgantown	WV	Website Entry	11/1/2020	733
Cool	Brandi		Morgantown	WV	Website Entry	11/1/2020	734

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Dixon	Jennifer		Morgantown	WV	Website Entry	11/1/2020	735
Dixon	Michelle		Morgantown	WV	Website Entry	11/1/2020	736
Runfola	Steven		Morgantown	WV	Website Entry	11/1/2020	737
Thalman	Mark	Resident	Morgantown	WV	Website Entry	11/1/2020	738
Wiles	Dayton	None	Morgantown	WV	Website Entry	11/1/2020	739
Murray	Sasha		Morgantown	WV	Website Entry	11/1/2020	740
Hassler	Beverly	None, homeowner Aaron's Creek Rd	Morgantown	WV	Website Entry	11/1/2020	741
Forte	Carol	Prairie Village Homeowner	Morgantown	WV	Website Entry	11/1/2020	742
Oldham	Ruth	Mountain Harvest Farm LLC	Morgantown	WV	Website Entry	11/1/2020	743
Nicholson	Ceann		Morgantown	WV	Website Entry	11/1/2020	744
Kelley	Patrick		Point Marion	PA	Website Entry	11/1/2020	745
Summers	Kathy				Website Entry	11/1/2020	746
Summers	Nieman				Website Entry	11/1/2020	747
Summers	Ray				Website Entry	11/1/2020	748
Cruz	Orlando		Morgantown	WV	Website Entry	11/1/2020	749
Cruz	Andy				Website Entry	11/1/2020	750
Kyle	Dawn	individual			Website Entry	11/1/2020	751
Martin	Greg		Morgantown	WV	Website Entry	11/1/2020	752
Murray	Travis	Personal	Morgantown	WV	Website Entry	11/1/2020	753
Mathess	Lisa	WVU	Morgantown	WV	Website Entry	11/1/2020	754
Carlson	Stephanie		Morgantown	WV	Website Entry	11/1/2020	755
Whitmore	John	Self	Morgantown	WV	Website Entry	11/1/2020	756
Harmening	Jessica	WVICL/Morgantown Composite Team/ Mon county BOE teacher	Morgantown	WV	Website Entry	11/1/2020	757
Klingensmith	Susan	Resident of Morgantown	Morgantown	WV	Website Entry	11/1/2020	758
Johnson	Matthew	WVU	Morgantown	WV	Website Entry	11/1/2020	759
Lasala	P. Rocco		Morgantown	WV	Website Entry	11/1/2020	760
Habuda	Peter		Morgantown	WV	Website Entry	11/1/2020	761

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Howell	Verna		Morgantown	WV	Website Entry	11/1/2020	762
Confere	Jason		Morgantown	WV	Website Entry	11/1/2020	763
Taylor	Margaret	Morgantown Resident	Morgantown	WV	Website Entry	11/1/2020	764
Mayer	Andrew	Archer Distribution	Morgantown	WV	Website Entry	11/1/2020	765
Carr	Savannah		Morgantown		Website Entry	11/1/2020	766
Hassler	Curt	Private Citizen	Morgantown	WV	Website Entry	11/1/2020	767
Hassler	Lea		Morgantown	WV	Website Entry	11/1/2020	768
Lorimer	Duncan	WVU	Morgantown	WV	Website Entry	11/1/2020	769
Mcneil	Brenden	citizen	Morgantown	WV	Website Entry	11/1/2020	770
Family	Hastings				Website Entry	11/1/2020	771
Test	Test	test	Test	WV	Website Entry	11/1/2020	772
Carver	Jeffrey		Morgantown	WV	Website Entry	11/1/2020	773
Laskody	Andrew	Mt. State Trailer Rental, aInc.	Morgantown	WV	Website Entry	11/1/2020	774
Mcbee	Jennifer	WV NICA	Morgantown	WV	Website Entry	11/1/2020	775
Lindstrom	Denise		Morgantown	WV	Website Entry	11/1/2020	776
Butler	Peter		Morgantown	WV	Website Entry	11/1/2020	777
Newbraugh	Kelsie		Morgantown	WV	Website Entry	11/1/2020	778
Weislogel	Amy		Morgantown	WV	Website Entry	11/1/2020	779
Henry	Judy	Individual	Morgantown	WV	Website Entry	11/1/2020	780
Bergner	Gwen		Morgantown	WV	Website Entry	11/1/2020	781
Corbett	Renee		Morgantown	WV	Website Entry	11/1/2020	782
Hessl	Amy		Morgantown	WV	Website Entry	11/1/2020	783
Maus	Alexa				Website Entry	11/1/2020	784
Mcdaniel	Rebecca		Mannington	WV	Website Entry	11/1/2020	785
Kobelski	Adam		Morgantown	WV	Website Entry	11/1/2020	786
Nicholson	Brody				Website Entry	11/1/2020	787
Root	Christian	citizen	Morgantown	WV	Website Entry	11/1/2020	788
Williams		Inner Life Yoga Studio, NICA	Morgantown	WV	Website Entry	11/1/2020	789
Richards	Garrett	Homeowner	Morgantown	WV	Website Entry	11/1/2020	790
Davidson	Scott		Morgantown	WV	Website Entry	11/1/2020	791

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Hughes	Courtney				Website Entry	11/1/2020	792
Rexroad	Sarah				Website Entry	11/1/2020	793
Hilling	Lynn				Website Entry	11/1/2020	794
Cale	Alyssa				Website Entry	11/1/2020	795
Trumble	Danielle				Website Entry	11/1/2020	796
Mccabe	Karen				Website Entry	11/1/2020	797
Ripley-Shisler	Rachel		Dellslow	WV	Website Entry	11/1/2020	798
Panrell	Guy				Website Entry	11/1/2020	799
Belling	Ella		Morgantown	WV	Website Entry	11/1/2020	800
Mckay	Jo	Self employed	Morgantown	WV	Website Entry	11/1/2020	801
Allen	Dwight	None	Morgantown	WV	Website Entry	11/1/2020	802
Hilling	Alexis		Morgantown	WV	Website Entry	11/1/2020	803
Hastings	Ted	Garlic Farmer/Distributor	Morgantown	WV	Website Entry	11/1/2020	804
Hastings	Mary	Joy And Hemp Universal LLC	Morgantown	WV	Mailed Letter	11/1/2020	805
Hastings	Mary	Joy And Hemp Universal LLC	Morgantown	WV	Website Entry	11/1/2020	806
Springston	C. Derek		Morgantown	WV	Website Entry	11/1/2020	807
Dowdy	Ireland				Website Entry	11/1/2020	808
Hastings	Mary	Joy And Hemp Universal LLC	Morgantown	WV	Website Entry	11/1/2020	809
Hastings	Dewey S.		Morgantown	WV	Website Entry	11/1/2020	810
Hastings	Dewey S.		Morgantown	WV	Website Entry	11/1/2020	811
Dalton	Judith		Morgantown	WV	Website Entry	11/1/2020	812
Hastings	Dewey S.		Morgantown	WV	Website Entry	11/1/2020	813
Hastings	Dewey S.		Morgantown	WV	Website Entry	11/1/2020	814
Shinkovich	Heidi	SFS FARMS	Morgantown	WV	Website Entry	11/1/2020	815
Hastings	Dewey S.		Morgantown	WV	Website Entry	11/1/2020	816
Hastings	Dewey	Taxpayer	Morgantown	WV	Website Entry	11/1/2020	817
Smyth	Justin		Morgantown	WV	Website Entry	11/1/2020	818
Kessler	Kayla		Morgantown	WV	Website Entry	11/1/2020	819
Beth Withers	Mary				Website Entry	11/1/2020	820

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Wilczak	Stephany		Morgantown	WV	Website Entry	11/1/2020	821
Fetty	Stanley	Kingwood Pike Homeowner	Morgantown	WV	Website Entry	11/1/2020	822
Hastings	Dewey	State lack of concern of public comment	Morgantown	WY	Website Entry	11/1/2020	823
Phillips	Trisha	private citizen	Morgantown	WV	Website Entry	11/1/2020	824
Maupin	Maya				Website Entry	11/1/2020	825
Coffman	Jessica	WVICL	Morgantown	WV	Website Entry	11/1/2020	826
Burkhart	Aira		Morgantown	WV	Website Entry	11/1/2020	827
Hilling	Dalton		Morgantown	WV	Website Entry	11/1/2020	828
Hastings	Dewey		Morganown	WV	Website Entry	11/1/2020	829
Hastings	Dewey				Website Entry	11/1/2020	830
Folz	Maryann		Morgantown	WV	Website Entry	11/1/2020	831
Wamsley	Chip	Bike Board	Morgantown	WV	Website Entry	11/1/2020	832
Wolfe	Michelle		Morgantown	WV	Website Entry	11/1/2020	833
Hastings	Ted	Notice from Concerned Parties	Morgantown	WV	Website Entry	11/1/2020	834
Hastings	Ted	Joy and Hemp Universal, LLC	Morgantown	WV	Website Entry	11/1/2020	835
Hastings	Ted	Joy and Hemp Universal, LLC	Morgantown	WV	Website Entry	11/1/2020	836
Hastings	Ted	Joy and Hemp Universal, LLC	Morgantown	WV	Website Entry	11/1/2020	837
Hillling	Sadie		Morgantown	WV	Website Entry	11/1/2020	838
Strough	Jonell	Mon Valley Greenspace Coalition	Morgantown	WV	Website Entry	11/1/2020	839
Reaves	Vanessa	Morgantown resident	Morgantown	WV	Website Entry	11/1/2020	840
Lasala	Leigh	Resident of South Park	Morgantown	WV	Website Entry	11/1/2020	841
Klingensmith	Shane	Resident of Morgantown			Website Entry	11/1/2020	842
White	Chris	We Run! Morgantown, other Morgantown area trail running groups	Morgantown	WV	Website Entry	11/1/2020	843

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Dalton	Harry	City of Morgantown public works	Morgantown	WV	Website Entry	11/1/2020	844
Zilkanich	Brandon		Morgantown	WV	Website Entry	11/1/2020	845
Gatlin	John	City of Morgantown	Morgantown	WV	Website Entry	11/1/2020	846
Haas	Vaike	West Virginia University	Morgantown	WV	Website Entry	11/1/2020	847
Bolyard	Jessica		Morgantown	WV	Website Entry	11/1/2020	848
Gatlin	John	City of Morgantown	Morgantown	WV	Website Entry	11/1/2020	849
Hastings	Mary				Website Entry	11/1/2020	850
Epley Brown	Adrienne	Sierra Club WV Chapter	Morgantown	WV	Mailed Letter	11/2/2020	851
Fish	David		Morgantown	WV	Mailed Letter	11/2/2020	852
Hastings	Jennifer	Conscious Harvest Cooperative 501(c)(3)	Morgantown	WV	Mailed Letter	11/2/2020	853
Hastings	Jennifer	Conscious Harvest Cooperative 501(c)(3)	Morgantown	WV	Mailed Letter	11/2/2020	854
Hastings	Jennifer	Conscious Harvest Cooperative 501(c)(3)	Morgantown	WV	Mailed Letter	11/2/2020	855
Hastings	Jennifer		Morgantown	WV	Correspondence	11/12/2020	856
Rogerson	Russell	Morgantown Area Partnership	Morgantown	WV	Mailed Letter	11/30/2020	857
Talerico	T.H.		Morgantown	WV	Mailed Letter	11/30/2020	858
Hastings	Jennifer	change.org	Morgantown	WV	Petition	11/30/2020	859
Ten Eyck	Debra		Morgantown	WV	Website Entry	11/30/2020	860
Bartlett	Scott		Morgantown	WV	Website Entry	11/30/2020	861
Tate	Christy		Morgantown	WV	Website Entry	11/30/2020	862
Carrico	Christopher		Morgantown	WV	Website Entry	11/30/2020	863
Maraffa	Lisa		Morgantown	WV	Website Entry	11/30/2020	864
Channell	Angela		Morgantown	WV	Website Entry	11/30/2020	865
Warnick	Venus		Bruceton Mills	WV	Website Entry	11/30/2020	866
Gandy	Megan		Morgantown	WV	Website Entry	11/30/2020	867
Piper	Christina	N/A	Morgantown	WV	Website Entry	11/30/2020	868
Haufe	Christine		Morgantown	WV	Website Entry	11/30/2020	869
Switzer	Katie		Morgantown	WV	Website Entry	11/30/2020	870

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Handley	Jerry	Viking Performance Training	Morgantown	WV	Website Entry	11/30/2020	871
Garvin	Paul	Retired Citizen	Morgantown	WV	Website Entry	11/30/2020	872
Unger	Merv	Homeowner	Morgantown	WV	Website Entry	11/30/2020	873
Covey	Hope	Interested Individual	Morgantown	WV	Website Entry	11/30/2020	874
Shirley	C. Steven	None	Morgantown	WV	Website Entry	11/30/2020	875
Walker	Jeff		Morgantown	WV	Website Entry	11/30/2020	876
Moorehead	Benjamin		Morgantown	WV	Website Entry	11/30/2020	877
Baker	Cheryl	None	Morgantown	WV	Website Entry	11/30/2020	878
Pugh	Penny	Citizen	Morgantown	WV	Website Entry	11/30/2020	879
Wasson	William		Morgantown	WV	Website Entry	11/30/2020	880
Weldon	Jeffrey	Citizen	Morgantown	WV	Website Entry	11/30/2020	881
Martin	Chris		Morgantown	WV	Website Entry	11/30/2020	882
American	Disabled	The Americans with Disabilities Act			Website Entry	11/30/2020	883
Smith	Maru				Website Entry	11/30/2020	884
Hastings	Mary				Website Entry	11/30/2020	885
Case	Harrison		Morgantown	WV	Website Entry	11/30/2020	886
Harmon	Ian		Morgantown	WV	Website Entry	11/30/2020	887
Jackson	J	property owner in county			Website Entry	11/30/2020	888
Harlan	Nathan		Morgantown	WV	Website Entry	11/30/2020	889
Stolzenbach	Nicole	Resident	Morgantown	WV	Website Entry	11/30/2020	890
Amos	Rachel				Website Entry	11/30/2020	891
Badzek	Susan		Gassville	AR	Website Entry	11/30/2020	892
Anderson	Kristina	N/A	Morgantown	WV	Website Entry	11/30/2020	893
Beabout	Cynthia		Morgantown	WV	Website Entry	11/30/2020	894
Lambert	Sarah		Morgantown		Website Entry	11/30/2020	895
Vecchio	Mike		Morgantown	WV	Website Entry	11/30/2020	896
Mayfield	Susan	None	Morgantown	WV	Website Entry	11/30/2020	897
Dalton	Wilma		Morgantown	WV	Website Entry	11/30/2020	898
Sions	Chasity		Morgantown	WV	Website Entry	11/30/2020	899
Johnston	Michael	Road user	Kingwood	WV	Website Entry	11/30/2020	900

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Jose	Aaron	public	Morgantown	WV	Website Entry	11/30/2020	901
Schuetzner	Irv	Citizen	Morgantown	WV	Website Entry	11/30/2020	902
Kerr	Beverly D.	N/A	Morgantown		Website Entry	11/30/2020	903
Christey	Damian		Westover	WV	Website Entry	11/30/2020	904
Janis	P	none	Kingwood	WV	Website Entry	11/30/2020	905
Dalton	James & Judy	Homeowners on the Kingwood Pike	Morgantown	WV	Website Entry	11/30/2020	906
Harris	Charles	private citizen	Morgantown	WV	Website Entry	11/30/2020	907
O'Brien	Cindy	NA			Website Entry	11/30/2020	908
Spitznogle	James				Website Entry	11/30/2020	909
Hufnagel	Michael	FEMA EHP			Website Entry	11/30/2020	910
Jenkins	Judi		Morgantown	WV	Website Entry	11/30/2020	911
Martin	Danielle		Morgantown	WV	Website Entry	11/30/2020	912
Perkins	Kimberly		Morgantown	WV	Website Entry	11/30/2020	913
Nutter	Roy	Resident of Morgantown	Morgantown	WV	Website Entry	11/30/2020	914
Roney	Marc	Individual	Morgantown	WV	Website Entry	11/30/2020	915
Wasson	Nancy	resident	Morgantown	WV	Website Entry	11/30/2020	916
Garvin	Hadden		Morgantown	WV	Website Entry	11/30/2020	917
Tucker	James		Terra Alta	WV	Website Entry	11/30/2020	918
Callahan	Susan	Resident	Morgantown	WV	Website Entry	11/30/2020	919
Cohen	Stanley	Morgantown Pedestrian Safety Board	Morgantown	WV	Website Entry	11/30/2020	920
Hilgar	Gary	Local Resident	Morgantown	WV	Website Entry	11/30/2020	921
Hastings	Jennifer				Website Entry	11/30/2020	922
Mcdonald	Callie			WV	Website Entry	11/30/2020	923
Whiteman	Hilda	Homeowner	Morgantown	WV	Website Entry	11/30/2020	924
Beale	Kay		Morgantown	WV	Website Entry	11/30/2020	925
Michael	David		Reedsville	WV	Website Entry	11/30/2020	926
O'Shields	Kelsey		Morgantown	WV	Website Entry	11/30/2020	927
Zannier	Jennifer		Morgantown	WV	Website Entry	11/30/2020	928
Born	Kristi		Kingwood	WV	Website Entry	11/30/2020	929

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Bragonje	Eva		Morgantown	WV	Website Entry	11/30/2020	930
Lee	William	WVU	Morgantown	WV	Website Entry	11/30/2020	931
Diznoff	Amy		Morgantown	WV	Website Entry	11/30/2020	932
Martin	Robbie				Website Entry	11/30/2020	933
Bennett	Rachelle		Morgantown	WV	Website Entry	11/30/2020	934
Hastings	Mary				Website Entry	11/30/2020	935
M	Brandon		Morgantown	WV	Website Entry	11/30/2020	936
Achieng	Nick	Conscious Harvest Cooperative	Morgantown	WV	Website Entry	11/30/2020	937
Hastings	Mary				Website Entry	11/30/2020	938
Friend	Jordan		Morgantown	WV	Website Entry	11/30/2020	939
Stamm	Nicholas	Monongalia Arts Center	Morgantown	WV	Website Entry	11/30/2020	940
Herget	Deborah	N/A	Morgantown	WV	Website Entry	11/30/2020	941
Cross	Matthew	Morgantown Pedestrian Safety Board	Morgantown	WV	Website Entry	11/30/2020	942
White	Marie		Morgantown	WV	Website Entry	11/30/2020	943
Beavers	Kelli		Reedsville	WV	Website Entry	11/30/2020	944
George	Sarah				Website Entry	11/30/2020	945
Carter	James				Website Entry	11/30/2020	946
Cohen	Steven				Website Entry	11/30/2020	947
Arnett	Melanie				Website Entry	11/30/2020	948
Cole	Ariana				Website Entry	11/30/2020	949
Jackson	Joy				Website Entry	11/30/2020	950
Knoy	Anthony				Website Entry	11/30/2020	951
Cardi	Michael	Bowles Rice LLP	Morgantown	WV	Website Entry And Mailed Letter	11/30/2020	952
Hastings	Mary				Website Entry	11/30/2020	953
George	Amy				Website Entry	11/30/2020	954
Witt	Patricia	Citizen of Morgantown, WV	Morgantown	WV	Website Entry	11/30/2020	955
Folz	Maryann		Morgantown	WV	Website Entry	11/30/2020	956

Last Name	First Name	Organization	City	State	Comment Type	Date received	Comment Number
Benison	Chris	Concerned Citizen	Morgantown	WV	Website Entry	11/30/2020	957
Richards	Garrett				Mailed Letter	12/2/2020	958
Skidmore	Dorothy		Morgantown	WV	Correspondence	1/6/2021	959

Table 2: Comments and Concerns Submitted

Please note that where possible comments are included verbatim. Any comments that have been summarized are marked as such.

Comment Number	Comments
1	The simulation shows four legs of the roundabout being two lanes wide but the roundabout is not a true two lane roundabout. Two parts of it are one lane wide. The actual roundabout that was built has two legs that are two lanes wide and two legs that are one lane wide. Which is how you can have a roundabout that is two lanes wide in some parts and one lane wide in other parts. You'll never see a roundabout built that has two lanes merging into one lane on a roundabout. It's a bad design and would not be built.
2	Options C and F. Keeps traffic flowing - one circle needs another to keep things moving.
3	email from South Park neighborhood association
4	N606 We do NOT need another roundabout in Morgantown!! Definitely don't need one on Greenbag Road.
5	I DO NOT agree with the proposed roundabout on Greenbag Road. Not only does it threaten the use of a resident's farm land, it also affects me as a resident of the Kingwood Pike area. The traffic light works plenty well, and a roundabout would only further congest the area. Look at the Mileground for example. I drive that area daily for work, and on some days, I sit in traffic for 30-45 min on my way home. I DO NOT want to experience that once, let alone twice in my commute. What would make my 20 minute (50 min in the evening) commute over an hour is not acceptable. Additionally, the area projected for the roundabout houses a community garden project that not only benefits citizens of the area, also has an environmental impact on clean air, pollination, and nutrition. I absolutely do not agree with the placement of a roundabout, and frankly I'm disappointed in the DOT for even suggesting useless expenses and frivolous spending of monies that could be well spent funding a number of road around the Morgantown area in bad shape-- Cobun Creek, Downtown Morgantown, Kingwood Pike, the Westover Bridge, and a number of other areas.
6	You are required to provide online commenting, if this is not fixed by the end of the day, it will be noted and you'll be hearing from our lawyer
7	Facebook
8	Hello could u please acknowledge that our text comments are being received?!?

9	I drive this road on a regular basis and I do not think that a roundabout would be the best solution at the intersection. Turn lanes with directional arrows on the lights would be the best way to alleviate the traffic congestion. The turn lanes could be both for going right up towards the Pike and another center turn lane for turning left to Dorsey Ave. The same scenario in reverse for coming in the opposite direction. The turn lanes would keep the traffic segregated and moving better. I do not that a small roundabout would be sufficient or safe in this area with the type of traffic and trucks that travel this road. All the roads affected are single lane and the roundabout would not have enough space to merge to single lane with the big trucks.
10	I think we need to put the roundabout in From a WV resident recent graduate from WVU, with background in sustainable construction, Regional development. It would serve the community very well to go ahead with the project
11	Putting a roundabout and destroying farm land is not the answer. A simple turning lane would be more effective. I have traveled this road for 10 years and the congestion does not call for a roundabout. We need to preserve land in West Virginia not put pavement through vital farming land.
12	I am writing to voice my opposition to the proposed roundabout. Not only will the construction of said roundabout significantly disrupt the day to day life of many residents, businesses, school and houses of worship, it will negatively impact several established farms. I am truly lost as to why DOT/DOH wishes to undergo such a massive project, inconveniencing hundreds of people for a significant period of time when the issues at intersection of Greenbag/Kingwood Pike/Dorsey could be remedied with appropriate turn lanes and appropriately timed traffic lights. Last year, this project was met with opposition and I don't know why you expect this year to be any different. Rather than delaying the decision another year, with the hopes of getting your way, simply fix the issue in the most convenient way possible (turn lanes and lights) with as little negative impact on those of us who actually live here.
13	We do not need a roundabout at the end of the Kingwood pike a turn lane would suffice at most, we really need the hill slipped fixed permanently and not falling in. Maintain the current roads. People have navigated the intersection for years simply following rules of the road one can navigate the intersection. Traffic is not backed up any worse than at the end of Green Bag and 119 during the 4pm hour. Do a visual survey with actual number of vehicles and wait times at both sites will see the deficiencies.
14	Facebook
15	Facebook
16	Where's the chat window for the online comments???
17	A roundabout at the intersection of Greenbag Road and the Kingwood Pike is a wonderful idea! It would solve so many problems!
18	Facebook
19	Website
20	The owners of the farm this would impact
21	I am a resident of Greenbag Rd.
22	We live in that area

23	Post card
24	Do not destroy farm land for a roundabout!
25	We do not need another roundabout people in this town can't even use the one we have. Putting one on Greenbag Rd is pointless the road is fine without it. The traffic doesn't get backed up there like it does other places
26	I do not support the roundabout project at the Kingwood Pike / Greenbag Rd intersection. I live and pay taxes and travel in Mon Co every day and I do not want this roundabout. Use state road funds for actual improvement projects that help our county, not make it dumb.
27	No roundabout on Greenbag rd!!! Leave their farm alone!!!!
28	I am very against the round about the money can be better spent on road repairs
29	I think a roundabout on Greenbag road is a bad idea and a turning lane would better work. I don't believe it is fair to the farmland to take their farm away to use the land for something that will cause more accidents than it will help alleviate traffic
30	Strongly object to a roundabout at that area. Affects school, land, and topography negatively.
31	Our family is adamantly opposed to the roundabout on Greenbag road. We feel it's an inappropriate use of funds that could be used to improve our area roads instead. The Kingwood Pike needs repaired and I don't mean the bandaid repairs you keep throwing on it. The "problems" stated that would supposedly be fixed by installing a roundabout are not problematic. The amount of traffic in this area had been reduced from less Mylan traffic- them working remotely too. If you'd listen to the residents who travel this area EVERY SINGLE DAY you'd know that the only thing needed is a turning lane. Destroying farm land is not the answer. Do you even bother to consider how the lives of everyone living on the Kingwood Pike would be impacted? Rerouting travel down Aaron's creek- have you been on that road? It's narrow, unsafe and not meant for the amount of traffic that would have to use it. Not to mention the impact on those residents! I have a teen driver - I do not want her driving that road! We have lived on the Kingwood Pike for 15 years and travel that area multiple times a day. This area is not the problem. Please listen to the residents.
32	Social media
33	Facebook
34	Social Media
35	Facebook
36	Facebook post against the round about
37	Facebook
38	Facebook
39	Post card mailed to us.
40	We live on the Kingwood Pike and want to express that we DO NOT want to see a roundabout put on at the intersection of Greenbag Road and the Kingwood Pike. We feel it would create many more traffic issues as well as destroying farmland and beautiful property. We feel a turning lane would be beneficial with traffic light arrows. The majority of the time there are not issues at this intersection. Rush hour times are the only times there are problems. Please listen to the people and consider alternatives. Again, we DO NOT want a roundabout forced on us at this intersection.
41	On Facebook

42	I am concerned about plans I have read proposing upgrades to the intersection of Dorsey and Greenbag Road. Here are my thoughts. I worked previously at the Dorsey Center near the intersection of Dorsey and Greenbag road so I have observed the traffic flow there for years. There are 2 situations that cause back-ups at the intersection. First, when school lets out at Mountainview and at South, traffic gets congested for a period of 30 minutes or so. Second, often cars turn across traffic to get onto Dorsey or Kingwood Pike. Since there is no turning lane, this creates a jam as cars wait for the intersection to clear. I have fewer observations at the Mississippi intersection but imagine that it is only school traffic once or twice a day that creates problems. Because traffic for most of the time is not congested on Greenbag road, just at school dismissal time, I would imagine a traffic light would suffice at Mississippi. At the Dorsey intersection, a center turning lane with a turning arrow light would keep the traffic moving and be a far less expensive and disruptive solution than a traffic circle. In order to accommodate the bus traffic, a large traffic circle would be required and would be no more effective than a light/turning lane.
43	My name is Lisa Keener. I live on the Kingwood Pike. A roundabout is absolutely not needed. It's ridiculous. I don't know who is profiting from a roundabout Kingwood. Pike is basically sliding off the hill and you think that you would be a little more worried about fixing that road instead of putting a roundabout and when all you need is a simple turn off. So with that comment, I'm definitely not in favor of the roundabout, and I don't know of anyone who is but we definitely do not want to around the belts at the bottom of the Kingwood Pike. Thank you.
44	Facebook
45	Facebook
46	Doesn't give a location for the meeting
47	Email
48	I spoke with you about a year ago regarding this project in Monongalia County. There will be an online meeting tomorrow I plan on watching but doubt I can include links with comments. I read much of the report and I am completely against a roundabout, let alone two. I don't even support turn lanes being installed if it would create a need for a detour. The road only gets backed up at peak hours which happens all over town anyway (all over America at 5pm really) and only takes about 10 minutes to get through at it's worst. There are only a few cars at a time at the intersection other times of day. A synchronized light would be sufficient too for peak times. Possibly a center turn lane where drivers have to yield won't take up too much room could be considered too. A roundabout will take acres of land. I do not feel it is appropriate when included as a designated heavy truck route. Just google the words, "Truck Rollover Roundabout" under news stories to see the problem nationwide. This is a very safe road where trucks are concerned and I would like to keep it that way. I would like to make 3 points since the last meeting: 1) I read the answers to previous complaints made in public comments included in the most recent report. The main one is the cost of this project when considering the deplorable conditions of our current roads in Monongalia County. My friends who drive for a living state Mon County stands out as the worst of all 55 counties they visit. Since you won't be visiting in person, enclosed is a photo of the Kingwood Pike side of the intersection. This was taken last week about 15-20 feet up from the stoplight. This hole is so deep that it requires me to get in the other lane to avoid it. It has been there for over 3 years. If you think this is bad so close to an intersection, imagine what the rest of the road looks like. For one, there is a slide that is still in need of repair about a 1/2 mile up from this. Much of the road up to the I-68 bridge overpass is collapsing and areas past the bridge are worn down to the gravel base. I drive almost 1 mile of 3 to get home in the wrong lane daily. The proposed detours, Aaron's Creek Road & Summers School Rd are 10 times worse than this photo. There is no way I will compromise my safety anymore than I do already by driving either of those roads. This will hopefully give you an idea why residents are so shocked and angered and keep bringing up "road conditions". (Odd that the MPO never addresses this much more important quality of life issue... What would $11 million dollars do to fix our REAL problems? Sitting 10 minutes at a stoplight only at 5pm won't destroy your vehicle). 2) There isn't a need to build

	sidewalks along Greenbag Road. There is no place to walk to other than one grocery store. It would be very inconvenient to carry groceries home and is completely unnecessary now due to recent public transit developments in the county. Mon County passed a levy last year paid for with our tax dollars offering free bus service for all county residents. Landlords are also provided free passes for their tenants. Greenbag Rd gets bus service multiple times a day on the current route. https://wvmetronews.com/2019/10/28/monongalia-county-taxes-learning-of-free-bus-pass-program/ 3) The MPO's initial meeting and surveys back in 2014 included very few people. Much less than the 200+ writing with concerns against this project. (BTW when holding public meetings, don't 200+ opinions count here?) Even the MPO's long range plan up to year 2040 considering future growth and development stated that a turn lane would be sufficient in their own report (see below). I would also like to add, this is currently one of the safest intersections in Mon County with the least accidents. (excerpt -pg 2 from MPO report) **Conclusion** *Alternative I, which provides exclusive left turn lanes with protected phases for the approaches on Greenbag Rd, has the most advantage in balancing overall safety and long-term operational efficiency. It would reduce vehicle crashes by 42% on implementation and reduce the intersection signal delay by 66% in 2040.* https://drive.google.com/file/d/0B8UM6dsVoQTIMk5OZnVQWXgzTk0/view https://www.plantogether.org/plans-studies As far as the 175 acre farm mentioned too, that was never developed and won't be due to utility issues. There is no natural gas on the Kingwood Pike. To further complicate things, any utilities (including water as Clinton Water Association can't handle that many additional homes) would have to be run under the interstate. The cost prohibitions caused the developer Dan Ryan Builders to back out a few years ago. These will continue to be long standing issues that any developer will face here so any largescale future home building in this area will be limited. Lane designation and signal timing is again mentioned here in the MPO's report. NO mention of roundabouts, detours, etc. are anywhere in this report. People justifiably feel blindsided. I would also like to point out that current signal timing WAS addressed (see below) and needs improvement. The DOH stated in it's latest report attached to the Sept. 29th meeting that signal timing was not even considered. This is not correct. (excerpt - pg 3) *The signal timing of the intersection is uncoordinated and is operated by pretimed control in which the cycle length, phase plan, and phase times are preset to repeat continuously. The southwest bound and northeast bound movements are allocated with 45 seconds green time and the southbound and northbound movements 35 seconds.* https://7b684dee-1ab5-4616-9992-9d54880108cf.filesusr.com/ugd/613794_26989372a58a4d1aa93dcdfd8da7179c.pdf I hope this sheds light on issues that are not being considered as far as I know. (Sorry in advance if any of this comes across as angry, rude or disrespectful. I am just in complete shock that such a large scale project is still being seriously proposed over nothing)
49	My name is Will and I'm a reporter for The Dominion Post. I am covering the meeting on the Greenbag Road Project. Can I please have the names and titles of the presenters? I caught Karen and Brain. However, I didn't get their last names or company.
50	Why can't the Kingwood / Dorsey ave roundabout shift closer to atomic grill location? It's current proposed location wipes out the conscience harvest field, which serves the community.
51	How much of the community garden will be taken for the project? What is the expected compensation for that land?
52	As someone who has lived on Mississippi Street for almost 10 years, I find the entire proposal absurd. Historically, roundabouts in Morgantown have been a disaster. The "Mileground" roundabout has literally made the traffic problem in that area worse than the stoplight that was there previously. That is even with more people avoiding that area. I work in the Senior Market, and have found a large number of people will drive longer distances to avoid that area completely. Now you are looking to implement the same thing on

	Greenbag Road just down from the Senior Center. So the roundabout will not affect the farm land? You mentioned no displacements. It seems like that farm will lose a large portion of that land.
53	What will be done to accommodate safe vehicle travel on Aaron Creek Rd. It is only a 1 1/2 lane road in terrible condition. Scary thought to have to travel that dilapidated road to get to town. Has additional money been appropriated to resurface and ditch the Kingwood Pike from the Greenbag Rd. to the Preston County line as the road is in ill repair and has been for years. This should take priority over the Greenbag road Roundabout Project, especially the Mississippi Roundabout.
54	This is related to the proposed upgrade of the intersection of the Greenbag Road and Kingwood Pike. The proposed Aaron's Creek detour is not fit for everyday travel. Poor road conditions, no guardrail, steep embankment, no room for two vehicles to pass. This route needs great improvement prior to becoming a detour for this project.
55	I am a resident of the Kingwood Pike. My family built here in 2005. Choosing this area for its proximity to our business, shopping and schools with the added perk of not being right in town. We have watched our road deteriorate and have bandaid fixes for years. Now this roundabout nonsense is being forced on us. I have so many concerns and for the first time ever fear for what this means to our family, all the residents of the Kingwood Pike, as well as for those living on Aaron's Creek, Cobun Creek and Summer School roads. Not to mention all those that depend on traveling the Pike from Preston County to access work in Mon Co. I'm begging you to reconsider. I fear for my teenage driver going to school and work on a very narrow, unfit road. For my husband who will not be able to access our business on the Greenbag road without going many miles out of his way and adding 20 minutes to his commute (a drive that is normally 3 miles). I fear for the safety of the children on the school busses. Do you really expect bus drivers to endure that? How bout the trucks delivering and transporting goods. This is an unfair, unwanted, unneeded solution. PLEASE listen to the taxpayers we do not support this plan. Fix our roads and install turning lanes.
56	Hello this is Josh
57	Hey team, nice work with meeting prep, look forward to tonight's meeting
58	Test comment - public input.com
59	Good evening! I have noticed the farmland at the corner of Dorsey Ave and Greenbag Rd is not being addressed or mentioned at all. What is the reasoning/ benefit behind this farmland being excluded from the study?
60	I personally know of at least 3 different families that are currently farming this property and have been for a decade or more to my knowledge.
61	Again. Why are we excluding the farmland property at the corner of Greenbag and Dorsey? It clearly shows on the map that this property is being overlooked. The farm is literally directly where the center of the proposed roundabout would potentially be built.
62	These farmlands have not been mentioned throughout this presentation. I am very curious as to why.
63	How will pedestrian crosswalks be safely operated at the locations of the proposed roundabouts?
64	Where do you propose the farmers that are currently farming in the area grow their food and medicine?
65	How do I access the minutes for this meeting? Comments/ questions/ and answers.
66	What about surface water drainage increases and localized flooding issues on the East side of the Dorsey Ave/Kingwood Pike intersection?

67	As a citizen and taxpayer in the great state of West Virginia, I am formally requesting an explanation as to why the farmland in this proposition is being excluded. I am not referring to the Campbell property. I am referring to the Hastings property. It is the site of Joy and Hemp Universal as well as Mocking Hill Farms as well as the Conscious Harvest Community Garden. Project. None of these businesses or organizations have been mentioned.
68	Why has the farmland on the Kingwood pike Greenbag road corner been ignored on the maps? The maps need fixed to address these impacts
69	Why haven't the two options (4 way stop and changes to the existing traffic signal) been studied? These are the only that don't destroy people's properties
70	Why have the two businesses on the pike/Greenbag road corner been ignored on the map?
71	Why do you think Aaron's creek road is an acceptable detour?
72	Why do you think a roundabout is safe at the bottom of a hill (Kingwood pike)
73	How will the noise and light pollution of all of the options affect the residences bordering the project?
74	Why haven't a study been conducted on the negative affects of noise and light on the neighboring hemp farm plants? Light and sound is harmful for hemp plants outside of their cycle, this should be considered.
75	How will construction debris be contained to ensure chemicals are not penetrating the soil of the farms at this location?
76	It is my understanding, that this intersection, as is, is a low accident intersection. Why fix what isn't broken?
77	I request an in person meeting in place of this virtual meeting. Many people were unable to attend due to the complicated nature of "attending" a virtual meeting
78	Many people's voices were lost today as a result of today's virtual meeting. Many people on the pike and Aaron's creek are elderly and don't have the ability to attend such a technology advanced meeting
79	I request that the first question asked in the first part of the meeting be answered again. Addressing the farm land not being mapped on the corner. There was a technical glitch and that question was not fully answered
80	A four way stop is the best option for this intersection
81	Traffic is only bad here for 45 minutes on weekdays at 5oclock
82	Many other roads need fixed with this money
83	The pike roads should be fixed before this intersection should even be considered for construction
84	Aaron's creek roads should be fixed before this intersection should even be considered for construction
85	Aaron's creek cannot handle a detour of this size and length of time
86	The road behind south middle that connects to Marjorie gardens should be reopened to the public as a solution for congestion
87	The closure of the road behind south middle to Marjorie gardens adds To congestion that should be opened before an intersection construction be considered
88	Roundabouts are not sufficient in West Virginia. This is at the bottom of a hill, very dangerous. They are being removed in New Jersey. How have the removals of roundabouts in New Jersey been considered in this project?
89	The roundabout at the mileground has not fixed its congestion issue, how would a roundabout here be any different? This is proof they don't work

90	Why would We spend 10 million dollars of money that we desperately need on road maintenance toward an unnecessary roundabout?
91	The DOH promised turning lanes in 2006 at this intersection, why hasn't this been addressed? Lack of funds we the excuse in 2006, but we have the funds now. Why isn't this being addressed?
92	Do our voices have merit? What do we have to do to stop this?
93	When is the in person meeting?
94	This meeting has so many technical issues and is confusing, the people demand an in person meeting
95	Why aren't we holding this project until we can meet after covid?
96	Can you define delineated?
97	Why was the EA not complete? It does not include a West Virginia department of Agriculture licensed hemp farm
98	This is an unfair meeting, we demand to hold off until a public meeting can be held
99	People's voices aren't being heard so hold off on meetings until we can meet in person
100	The project should be delayed if the public can't be included at the meeting
101	What person(s) and/ or organizations are accountable for the information provided in the "studies" that are being referred to?
102	why are you not responding to phone calls?
103	This is an unfair way of meeting, why should the project go on, if people are unable to attend?
104	We should delay the project until the people can be heard
105	People can't be heard on this platform this is an extremely shady and inefficient meeting
106	Are phone calls not being answered?
107	why are you not addressing the fact that there are three businesses that reside on the corner of kingwood pike and Greenbag rd?
108	Where's the public chat room?
109	I need help logging on
110	Can someone help me log in?
111	what about the people in the air?
112	aye?
113	what about the people in the queue
114	If there's so many questions, can we hold off on this meeting until people can actually attend and be heard in person?
115	We feel unheard with this meeting
116	the third option is in queue and to be answered on the live via the call
117	A lot of my questions haven't been addressed, how will you address my questions that will not be answered in this meeting?
118	How much money have we spent on billable hours to stahl Shaffer on a project with unattainable options?
119	I'm sorry but I'm having a hard time understanding the people when they talk, Will you guys please slow down in your verbiage?
120	We need another EA, we do not believe the aquatic study was conducted properly and ignored many key points.
121	please answer the one singular person waiting in the queue
122	Are our questions being considered in real time or are the answers already formulated?

123	I'm sorry but I cannot understand what the gentleman is saying who answered questions. Could he please repeat?
124	the presentation is the same every time. why even go over it again? why not just let that the last two hours be just questions
125	we don't need the presentations again
126	we need the questions answered
127	We reported that y'all aren't answering the *3 live answer question. Our complaint was recorded by operator 919 at 645 pm at Mecca. For not taking the live calls, this meeting is void and theft
128	The live answer question *3 were parameters of this meeting that you are not complying with.
129	How have only 6 questions been addressed?
130	There is information in this presentation that is in direct conflict with the taxpayers and citizens of this community. Some of the information is false and misleading. How can this be properly reported to Federal Authorities?
131	I've asked at least questions myself, and I can't be the only one. We move for halt of this project and demand an in person meeting
132	My grandpa doesn't have internet or phone, how can his voice be heard?
133	My neighbor threatened suicide from years of stress due to this project taking their lands
134	I can't understand what he is saying
135	What was the response to the 2006 turning lane question I sincerely can't understand what he said
136	why haven't any of my comments been answered
137	there are three business farms that reside on the corner of kingwood pike and Greenbag rd
138	you will ruin their lively hood if you start this project
139	Why wasn't the impact to farmland considered on the EA?
140	How are comments weighted? If y'all get enough comments will the project be stopped?
141	I've spoken to over 100 people who are all against the roundabout
142	Multiple people have been waiting to get on the line y'all aren't answering questions
143	this presentation is monotonous
144	This is unfair you're not letting the people speak
145	we didn't need it again for a third time
146	the last two hours should have been questions and comments only the presentation is far too long and you don't allow enough time for the questions and comments to be addressed
147	What's the point in having option 3? We've been waiting for 40 minutes on option 3 this is not fair you're ignoring people's questions they haven't even been heard! Not even one word spoken
148	Will u address the fact that you're not answering *3?
149	We have reported fraud with officer Phillips at 745 pm for you not taking public questions on *3
150	Two separate people have been in line one and two and y'all have not answered them to be heard
151	The disregard of public comment has been reported to the sheriff

152	The vast majority of participants after the last meeting (over 200) are against this project. It does not help confidence in the public comment process that this project is still being forced upon us after considerable public outcry and complaints. What will stop the project from continuing at this point?
153	I am invested in property in the area the is being committed on! I was told I was number 2 on the list and I've waited 40 minutes and have yet to speak! I need answers NOW! I need my concerns addressed Now
154	Lieutenant Burkes has been notified of this fraudulent meeting, not answering *3 calls while lying and saying you are. Frauding us out of our comment opposing the stealing of our land and business. Cheating us out of money. 7:17 report
155	oh did I get removed from commenting
156	there are eagles nests in the area
157	I guess you don't receive picture mail
158	Why was the landowner not notified of the virtual meeting?
159	Do you understand the implications you've had on the landowners family?
160	Do you guys work for satan?
161	Multiple business owners have been affected by you're refusal to answer *3 comments
162	Why aren't questions being answered on *3 why is this an option if you're not answering?
163	This is fraud that people can't speak during the meeting
164	It is fraud because by not taking our comments, the effect of that is stealing our land because our opposition wasn't heard. If this results in construction because our voices weren't heard, that's frauding us out of our property and business money. Legal action will be taken. Complaints have been filed this is wrong it's been 2:30 hours and people still haven't spoken
165	You may want to Address the fact that *3 isn't working
166	do you know how much of the community you damage by putting in the roundabouts? because it's a lot! it's local produce being provided for farmers markets and to local restaurants in the area. it's cbd for people who need to feel less anxiety, the same anxiety you are currently causing me and my loved ones by even proposing a roundabout. we have already gotten the law involved and we will get a lawyer and fight this to the end! mark my words! the land you want to touch is sacred to loads of wildlife, you will be ruining their habitats as will in the process. it's not like they have leases and know when they need to move. you uproot wildlife families and surrounding human families! also your thousand page document doesn't address very many questions or comments from the april 2019 meeting. the land owners are severely confused and appalled by this!
167	I watched the 5:00 traffic while on this meeting from the site. It was backed up on one side for 15 minutes. This slight inconvenience does not warrant a 10million dollar roundabout, the destruction of farmland, our businesses and our livelihood
168	Are you really not answering anyone on the phone? I've confirmed with 4 business owners they've been in line for HOURS
169	why has this meeting been silent 90% of the time? We demand a public meeting after covid. This meeting wasn't even a meeting
170	It's impossible for you to be answering questions and transcribing them if you're not answering them!
171	How can u transcribe when the person hasn't even gotten a chance to speak? That's a lie
172	The question asking about information already presented is completely inefficient
173	You just address that you're not live comment at 7:45

174	You JUST ANNOUNCED with 15 minutes left in the meeting that you're not taking live calls *3. Why have the option? You cheated dozens of people out of their comments by lying and saying they could live comment on *3
175	What percentage of questions have you answered?
176	What is the expected completion date of this project?
177	maybe people need to be a little more patient, leave at an appropriate time from their houses or work to get to the next place without feeling rushed. if everyone could chill out and be a little more courteous on the roads then maybe we wouldn't be having any of these meetings! maybe there would be a problem here
178	Has the proposed budget been accepted? If so, how much will be coming from federal and state funds, respectively?
179	2
180	this is what your trying to do to this community I hope you received this picture
181	20 basket and I would like to make a comment that I don't think the roundabout should happen at all. The congestion is never that bad. I travel a road daily, but I do believe that there should be sidewalks put in on that road. I know that people walk along those along Greenbag Road quite frequently and took the Avenue and those two roads should definitely have sidewalks dislike Million Dollar Round about projects that you guys want to complete wage are profound. They don't need to actually have it at all in my opinion. oh, I just I just hope that we can all agree that they're a bit too much. The roads are perfectly fine. The way they are. I mean, there's potholes everywhere and those could be definitely be addressed but Like I said, the roundabout is just not it's not going to fix any issues. It's actually going to create more issues. They recently just removed around about in New Jersey and because it was creating issues. So yeah, maybe take that into consideration that one of the states that was like really Pro round about is not taking it out. So, yeah, thank you, and I can't wait for the meeting at 5. I hope you all have a great day
182	This is josh. This is a test comment.
183	Test comment
184	Example private comment (5:22)
185	Testing the comments.
186	Karen Reed - Markosky Brian Hoffheins- Stahl Sheaffer Engineering
187	I used Google Chrome and I now see the Comment Box
188	I prefer option c on Mississippi intersection; option F Dorsey Ave/kingwood.
189	Aaron Creek Rd and Lower Aaron Creek Rd are not suitable for excessive traffic. Will they be Improved for this detour?
190	I live 2 miles up the Kingwood Pike and I work at the Prison complex. The detour you propose it's absurd. I moved where I live for the convenience of Morgantown and where I work. The Aaron's Creek and Lower Road are single lane in most areas and with this increase in traffic volume will be a highly dangerous route of travel. Will access to Greenbag be available in early morning hours at least? Like before 6 am? AND for the record, roundabouts are awful, the only thing needed at the intersection are turning lanes, but I see y'all don't care what tax paying community members think.
191	How large are these roundabouts? Larger than the one on Mileground Rd I hope!

192	Why did the EA fail to address the harm caused by the preferred alternative F (roundabout) to the Conscious Harvest Cooperative non-profit organization as well as the destruction of farmland utilized by the local business Joy and Hemp Universal LLC?
193	An adverse condition of enhanced access for Dorsey Avenue from the intersection of Greenbag Road Design Option F and from Don Knots Blvd can be found in studies and traffic modeling which use Lucky Lane; From start of project and once completed there will be a greater amount of vehicle noise, larger trucks accommodated on Dorsey Ave, means more noise and heavier traffic volume. One condition would be additional traffic noise from Dorsey Ave. QUESTION: Would reducing speed limits on Greenbag and Dorsey Ave be considered in the process? I strongly disagree as a resident of Apolla Drive on Opt. F being best ideal design. I currently see a huge amount of thru-traffic through my neighborhood. Allowing trucks, and more heavier traffic volume means that when vehicles back up for school on Lucky Lane, the flow will be even more through Apolla Drive. This impact on Opt F will only serve as a higher percent of vehicles cutting through Apolla Drive, added service calls to Mon County Sheriff (due to speeding and traffic back ups), and is not in my opinion a preferred solution. I would settle on Option E, but NEVER on Option F. The school sees a steady flow of traffic in morning and afternoons, Opt. F does not take that highly into consideration. Question: Was Don Knotts Blv the preferred route for heavy trucks in the past? And why is that not taken into the process?
194	I wish to know what type of sound studies were collected on Dorsey Ave and corner of Apolla Ave. This project will severely impact future road noise and through traffic by encouraging more traffic to use the Pike/Dorsey intersection. What will be done to curve the noise and traffic if this project goes through. Is a cement wall as a noise barrier at corner of Dorsey and Apolla Ave something that will be built? If not, it should be, the noise as of current is well beyond normal range for a feeder road such as Dorsey Ave.
195	The amount of traffic on Dorsey Ave near Apolla Drive where I reside is my main concern, in addition to additional traffic flow that Apolla Drive already has flowing through it before project.
196	The phone line has gone silent
197	The report says no businesses would be relocated. The local business Joy and Hemp LLC would potentially lose the ability to operate without their farmland that would be taken by the roundabout. Why was this not considered?
198	A major concern beyond pedestrian safety, is that of encouraging more commuters to use Dorsey Ave instead of Don Knotts Blvd to access downtown. As of today cars are still barring down Dorsey Ave well beyond the speed limit, and beyond what the road was designed for engineering wise.
199	The environment assessment leaves out businesses that will be destroyed by the roundabout option
200	Hello, my name is James Cress and this is from the fresh mint Indian Grill from Morgantown West Virginia. We are very much particular about this form and we also buying a lot of vegetables and the garlic and everything. They just love this place and they are amazing. And then also they grow so many things and natural organic. So we are really very practical to have this and have to keep this form. That's what we like to support, and we just wanted to keep this forever for the public to buy everything and people also had a fresh grown vegetables in the area. So we are very happy to keep this. Please try to save for the public and for us and for everyone. We are grateful to see this always. Thank you very much and have a great day in my name is James West Palm. If you have any questions, call me back on 412-996-6557. Thank you very much. Have a good day.
201	How can you take the farm business on the southwest corner and not allow these WV farmers to continue to making a living and providing for their families and their future?
202	Why is farmland that is being utilized by multiple families, a profitable business, and a non profit organization being excluded? I'm referring to the corner of green bag road and king wood pike.

203	2 For Profits Agriculture businesses currently operate on the farmland on the corner lot, including a WV licensed hemp farm. There is no mention of this in the EA
204	What is the timeframe proposed for closure/access to Greenbag road for travel to the prison?
205	None of the other roundabouts in Morgantown have alleviated any traffic congestion because the root cause of the traffic was never addressed. Please expand on the underlying conditions that would justify a change in the intersection.
206	Why is the construction of the roundabout on the mile ground include an elevation change? It makes traversing the roundabout awkward and dangerous.
207	Now are they going to accommodate the detour traffic on Aaron's Creek Road? It is only Elena and half with terrible ditches at this point in time. The name is Candice. An additional questions have anybody considered accessing the interstate at the Kingwood Pike overpass bridge at the interstate to alleviate traffic control going to cross section might be an alternative. The intent is 304-296-3064 is my phone number. Thank you.
208	My name no. I live in Dorset Avenue for about twenty years. I go back and forth in this section month old this time. I use it a lot during the day and my comment is I think it's the round about it is very often a big waste of money and land most of the countries like third world countries, even they get off the roundabout and we I think it's the best way to plan our city or a future month. So all you need instead of the round about all we need we need just to put a third line will be a middle line to a neighbor who come in Thursday. From Green Bag road to turn to Dorsey Avenue and the other side of that added track it just an error like a big city just the 3rd line. It's just it's another big construction. It's an easy construction adding a third line to the road each Road like Greenburg Road and Dorset Avenue in Long by with whatever who's going to turn going to be in the middle and turn that's easy and cheaper save money for the city and save time for us and keep us from this all long time of detail and construction take off a month in Big Money Train out of the city budget. So this is what like a new cities designed like that wage. And no waste of land and property and money. Thank you. I wish you success.
209	What residences would be displaced by the roundabout? It is not clear on the map.
210	Will the speed limit be reduced in order to create safer passage through a round-about at Pike/Greenbag intersection? If so, what will the speed limit be? What consideration was made to encourage through traffic from 119 to use Don Knotts Blvd instead of re-routing it through Dorsey Ave and Greenbag Road which will cost more money, when there is already a solution in place, i.e. Don Knotts from Grafton Road and 119. Missi. design makes sense to me, but not the intersection of Greenbag/Pike. May need to rethink your inks there. Opt E may be a decent option.
211	What residents would be displaced on the non-round about options?
212	What could be done to help educate the public on proper roundabout traffic etiquette. I have experienced many near collisions due to inexperience with roundabout use.
213	I am hearing there will be measures taken to increase flow of traffic on Dorsey Avenue, yet, what are the measures to reduce the noise created by the increase in traffic volume that such a new design? which will surely encourage once project is created and after a long disturbance is created in route routines.
214	The moderator does not appear to be fielding comments regarding the community garden or local business Joy and Hemp Universal LLC affected by the roundabout. Why not? This is unfair to the participants
215	What measures have you considered in order to be certain prison staff can respond at the prison when called upon in emergency situations?

216	As someone who has lived on Mississippi Street for almost 10 years, I find the entire proposal absurd. Historically, roundabouts in Morgantown have been a disaster. The "Mileground" roundabout has literally made the traffic problem in that area worse than the stoplight that was there previously. That is even with more people avoiding that area. I work in the Senior Market, and have found a large number of people will drive longer distances to avoid that area completely. Now you are looking to implement the same thing on Greenbag Road just down from the Senior Center. So the roundabout will not affect the farm land? You mentioned no displacements. It seems like that farm will lose a large portion of that land.
217	Why do you think Aaron's Creek road can handle the detour traffic? Will DOT fix Aaron's creek prior to detour start?
218	How are the three phase distribution lines which run along the roads be rerouted?
219	There is a lot of talk about creating Opt. F for Pike/Dorsey Avenue, why is Opt E not being addressed further as a solution? What logical reason can you present, that would direct a project at Pike/Dorsey/Greenbag Road, when large tractor trailers and vehicles can access downtown through 119, and Don Knott Blvd?
220	What happens if the property owners refuse to give up their land?
221	How does a +$10M roundabout constitute a one letter grade on the intersection solution?
222	I understand the safety components within your considered design. Such as sidewalks and turn out lanes, this is very reasonable. However, to encourage large trucks and vehicles to use a 'feeder road' such as Dorsey Ave to filter such heavy traffic, where is your logic there and please explain in simple terms? Keeping in mind that traffic from 68, North and South bound currently use 119, and Don Knotts Blvd, so why spend extra money and create a new route, when one is already created and in place now?
223	This is no foresight again with Dorsey Avenue live in Dorset Avenue. Now question why we cannot have our intersection like Greenback roll with Kingwood Park and Dorsey, same as the one Patterson Drive with University Avenue. It's a very successful intersection and a lot of traffic in it and very fast and the way they did it weigh much better and cheaper than than going to go as the office round about
224	Wouldn't a turning lane on Greenbag Road at the intersection of Dorsey Ave and the Kingwood Pike be cheaper (and safer) than a roundabout?
225	Why is the money going towards this project instead of fixing and paving the roads, especially the Kingwood Pike?
226	Deb cantus question what will be done to accommodate heavier travel for the vehicles on the errands Creek detour off? It is only a 1 and 1/2 Lane with terrible ditches.
227	This seems like a lot of wasteful spending to reduce traffic that just isn't there 99% of the time. Also is it true that large trucks will be diverted from going downtown to going across the Greenbag instead?
228	I just want to make a comment concerning this round about first off the bath. Has anybody considered used in the access the interstate via that came with Pike bridge to alleviate traffic coming out of Preston County going to Morgantown in alleviating the intersection in addition to that. I'd like to know if the funds for this roundabout could be used with turning lanes and put some of the funds into palm of the Kingwood Pike. That's an e repair the roads in terrible condition. The dishes haven't been cleaned out in years and the pike itself needs to be resurfaced all the way to the Preston County life. So, you know, those are a couple concerns I think is more pressing than a roundabout at the Greenbank Road is to maintain their current roads.And and yeah, you know, it's I think it's more important than the spending this money at this roundabouts of Mississippi Street, and we need to maintain what we go out before we start another Avengers. Anyway, thank you for your time. And if you want to take a ride up that came with Pike and you can see what I'm talking about. Goodbye.

229	I have listen to the presentation and Q&A after, yet, the question of why, and what concrete evidence to re-route traffic such as heavy trucks and delivery trucks and to accommodate them through greenbag/Pike/Dorsey Ave. Dorsey Ave was never created to handle the amount of traffic. Why are designs focused on creating accommodations for more traffic on Dorsey Ave, when 119 from 68, and through Dont Knotts are already in place. Why spend more money on a project that already has a soultion in place, which is Dont Knotts. Please explain the logic?
230	At the intersection of Mississippi Ave and Greenbag Road, a stop light intersection may work better than a second roundabout, as well as take up less space and cost far less.
231	As a tax payer, long time resident, and concerned citizen of Morgantown, I do have a few questions; 1. Why is Greenbag Ave-to-Dorsey avenue traffic design as an alternative even being considered when a completely proper route to downtown already exists from 68, via 119, to Don Knotts Blvd? Please explain why an Option F should even be mentioned as an alternative? Please keep in mind that Dorsey Avenue was never intended on filtering high volumes of through traffic, but rather neighborhood traffic only. Per county design historically. 2. When is the estimated begin of construction, once this projected has reached a final conclusion? 3. Will speed limits be reduced along Dorsey Avenue entirely to reduce noise, and potential vehicle accidents? If so, what will the new speed be, and how will your company make final recommendations for such?
232	Why was the EA not complete? The EA leaves out productive agriculture land at the corner of the greenbag rd/kingwood pike
233	Why was the farmland at the corner of Greenbag Road and the Kingwood Pike not considered productive farmland? I have seen that a large portion of that area (which is the majority of the area taken up by the roundabout) has been farmed for years.
234	The Cultural Resources section of the EA is incomplete. The historical nature of the lots in the land displaced includes some areas in the city. Including the corner farmland which is part of the City of Morgantown.
235	We request the Dorsey/Kingwood Options of D,E,F Design Review be Reviewed by a third party engineering firm.
236	More and more American's are working from home. We request a review by a third-party to assess the alternatives need for differing schedules for the schools day schedule.
237	Hi I live in Bluegrass Village. A few yards from the intersection of Greenbag Rd & Dorsey & Kingwood Pike. I would approve widening that intersection but to put a round about there is overkill. And would certainly affect the quality of life of all the residents who live in Bluegrass Village. The round about at the Mileground was unnecessary. A round about at Dorsey/Greenbag/Kingwood Pike would take the land that is importantly used for community gardens. This is a healthy, productive use of this land.
238	The Wetlands across from the Bluegrass Village has not been properly assessed. The citizens request a review of other native endangered species.
239	MMMPO's studies to not represent the current working environment of 2020 and beyond.
240	Option C at Mississippi appears to be the most expensive option with limited performance
241	Dorsey Ave/Kingwood Pike is currently a letter C. Not bad :) An Arrow would help easily.
242	How long/tall will the retaining wall be at the southeast corner of the kingwood pike roundabout?
243	Option F at the Kingwood Pike intersection is the most expensive option.
244	Roundabout would not improve the letter grade much....?
245	That's sad

246	Why are you pushing Roundabouts?
247	The truckers coming down the pike do not want a roundabout.
248	What guarantee is there that the hillside at the kingwood pike roundabout will not slip, as it always has in the past, causing damage/loss to the historic home at 27 Kingwood Pike?
249	The cost of the roundabout at the kingwood pike would destroy 100 year old farmland and destroying a WV Hemp farm and a local family's livelihood.
250	Do you feel that Dorsey Avenue is able to safety handle big rigs, large tractor trailers and large trucks, especially during inclement weather? Keeping in mind that that road is steep and windy as well. Please use Option E for Greenbag Road to Dorsey Ave. Left/Right turn lanes, if this project goes through, it is the only one that makes sense. Why encourage more potential accidents on Dorsey Ave and at the intersection of Pike/Dorsey? Yes, there are other round-bouts elsewhere in Morgantown, and they back up very often. Please explain how your design will cost the tax payers of Morgantown less, when accidents, and other delays will happen due to a local road such as Dorsey Ave?
251	Why was an alternative to NOT include turning lanes on Dorsey and Kingwood Pike, while providing center turn lanes on Greenbag not explored? This would not disturb any residences, reduce construction costs, and address the real problems on Greenbag road.
252	When is the in-person meeting?
253	what happens if the property owners refuse to sell their property for this project?
254	Short and sweet; when construction is happening how will you truly mitigate and prevent traffic detoured from project through Lucky Lane and Apolla Drive? Apolla Drive is a small, poorly maintained residential feeder road; how will you prevent large amounts of traffic from turning into this street, when Lucky Lane is backed up due to construction traffic, accidents and school events? This sounds like a very bad idea and planning to me.
255	the detour if using Arins creek road is outrageous. It is unsafe with no guardrails. Winter would be a total nightmare. Is Aaron's creek raod going no be repaired first?
256	My neighbors couldn't make this meeting. The internet is out because of the storm.
257	I vote for the no-build alternative!
258	Can you hear me? Where is the public comment chat?
259	Will law enforcement be present to ensure commuters use Lucky Lane as the detour, rather than flooding through Apolla Drive during any construction? A no build on Dorsey/Pike is my hopes. Thank you.
260	Even though a light/noise study was not required for this type 3 project, what steps/considerations are being taken to mitigate the disturbances by the increased level of traffic being directed at the 27 Kingwood Pike residence? Current distances from the intersection to the home will be cut in half from the outer edges of the roundabout radius
261	Would you agree, deletion of turning lanes on Dorsey and Kingwood Pike, while adding lanes on Greenbag is not the same as a no build alternative?.
262	Are you taking phone calls? There are people on the line
263	at least one person we know of...
264	We should delay the project until the public can be included. The local people will be impacted and need to know this information.

265	Where is the public chat room?
266	If someone wishes not to give up their property and it is forcefully taken it is a crime. If that property value exceeds a certain monetary value it is larceny and or grand larceny a felony crime. Our resources are continually being stolen and sold back to the community. The state can kill over property. But citizens cannot? If people gotta sit in traffic a little longer who cares. That intersection is not that busy. How about a better public transport system? Oh but then the state cant get that fed money. That same fed money Justice got and dispersed to his buddies for the covid fiasco. Were tired of being hood winked we are not cattle we are not animals we are creations of the God of nature, not the god of the state. Were are awake thank you.
267	I didn't understand that. It says there is a live que phone option.
268	Will you take phone calls next hour?
269	Tom Richards landowner long green bag Road would like to know why the proposed roundabout at the intersection of green bag Road Kingwood. Pike is being proposed on alluvial soils that are determined to be unstable since the construction of the green bag Road the 1960s. I think this is detrimental to the property at 27 Kingwood Pike, and we've already lost five acres of land to construction a green bag Road in the 1960s. Thank you.
270	I would like to voice my support for alternatives D and E rather than the preferred alternative F, being the roundabout. First, this area is the only community garden I am aware of in Morgantown on a 100+ year-old farm. Although it does not meet the legal definition of "productive farmland" it does produce a harvestable crop. In fact, this area is productive enough that one individual received a felony for stealing the crops planted there. Second, many drivers in Morgantown are not great at driving in roundabouts, and I could easily see this becoming an issue for tractor-trailer drivers coming off of the Kingwood Pike or making a wrong turn from many of the businesses on Greenbag Road. Although you mentioned this has been considered and mitigated, I see this issue happening commonly at the roundabout on the Mileground. Another option would be to move the roundabout in alternative F to the opposite corner, which would take up a former restaurant which has now been vacant for over a year. Thank you for your consideration.
271	Is that a human or a robot..! Q& Pre-Recorded A
272	Got it. Thank you!
273	Have there been any post construction surveys conducted on the other roundabouts in Morgantown to assess their efficacy in alleviating congestion and hazardous traffic situations?
274	what is the budget of the project?
275	Do you feel this virtual meeting adequately addresses the public concerns as well an in person meeting?
276	If you are concerned with a threat of suicide please refer your neighbor to 1-800-273-8255 for suicide prevention assistance.
277	What is the value of a small business CBD hemp farm in WV's Opiod epidemic environment ?
278	I do not find it necessary to remove an operating farm to address a traffic problem that is only congested two times during the day. Adjust the traffic light if alleviating backed up traffic is the the priority when Mylan let's out at 5pm. The traffics light in this area has worked effectively for years.
279	call in questions are being ignored. we demand an in person meeting when COVID subsides in place of this meeting
280	Why was this public meeting scheduled for the night of the biggest presidental debate in US history?

281	I've found alot of old items on the farm land where the community gardens are located and near by with my metal detector including silver coins from the late 1700s called reales and or pieces of 8 and early colonial coins like large cents and a british half penny and old buttons. Are we sure the land does not have some kind of historical value? I know from maps from the mid and late 1800s that the house owned by the hastings was once owned by a mr Dorsey.
282	This is related to the proposed upgrade of the intersection of the Greenbag Road and Kingwood Pike. The proposed Aaron's Creek detour is not fit for everyday travel. Poor road conditions, no guardrail, steep embankment, no room for two vehicles to pass. This route needs great improvement prior to becoming a detour for this project.
283	No Thanks you! The kingwood pike intersection project would remove 3 local food supplies! Much of West Virginia is a considered a food desert . A food desert: an urban area in which it is difficult to buy affordable or good-quality fresh food. "many poor people live in food deserts—where they have plenty of food but none of it healthy"
284	Would like to see turn lanes and a sidewalk! At both intersections
285	Food Desert: an urban area in which it is difficult to buy affordable or good-quality fresh food. "many poor people live in food deserts—where they have plenty of food but none of it healthy"
286	Preliminary or not. It does sound like your studies and research do need deeper planning with all agencies involved, and better ways to answer tax payers questions. You need more realistic reasons for doing thing, rather than speeding money you have from federal gov.
287	The proposed detour route roads will need considerable upgrades and maintenance in order to accommodate the proposed traffic. Will the additional cost to improve the detour roads be covered under the project funding or will additional funding need to be allocated.
288	There seems to be a private interest to sell this roundabout idea at the detriment of citizens and local farmland. Turning lanes at the intersection of the kingwood pike would suffice for traffic now and long well into the future.
289	This meeting violates the set groundrules. The public comment option 3 to call in with a question or comment is not available. My friend can't threw on the phone. We demand an additional public meeting.
290	The finding that No Significant Impact is not correct!! There is MAJOR IMPACT to the local hemp industry development. This is the Headquarters of WV's 185th Legalized Hemp Farm. At one time, hemp was a WV grown cash crop and a dependable natural resource for the US Armed Forces in WWI and 2. It is now a current and future small business in a growing CBD industry resulting in increase healthy resources for Morgantown residents.
291	There are endangered falcons on the land in question.
292	The agricultural land impacted is two entire for-profits farms;
293	the environment assessment is incorrect! why are you missing key information related to productive farmland?
294	These are our tax dollars at work, The displacements are incorrect. Preferred Alternatives are not preferred by the local citizens.
295	The owner of the corner of the greenbag rd/kingwood pike lot would gladly sell additionally land put in additional lanes to reduce the impact on local residences. Please consider talking to us and considering other Alternatives. Thank you!
296	The citizens request a third party review of the Environmental Assessment.

297	The citizens request an independent environment assessment and project traffic review. These items are not currently complete. Additional information is needed prior to spending Millions of WV's hard earned money. God Bless West Virginia.
298	The Roundabouts in New Jersey are being taken out right now lol
299	Could we consider a turning lane only on the green bag road and not on Dorsey?
300	Senior folks in WV don't like roundabouts.
301	Neither do logging trucks...The logging trucks up the Pike are not on this meeting.
302	This is complete insanity. I'm a long time resident of the Kingwood Pike. I have lived through the 4 way stop sign transition to the light and now this. Do you even have people that are local, living in this area conduct surveys about the validity and need for these changes? I assure you the so called "problems" are no where close to the problems 2 roundabouts in less than a mile will create. I would like to know how you find the Aaron's Creek and Cobun Creek Roads suitable for the amount of traffic that will be forced to use them. Who is going to pay for my vehicles being destroyed because of the condition of those roads? Would you feel safe sending your family out on those side roads? The disturbance of every family that is cut off from town- their jobs, stores etc. The solution is turning lanes not this absurd roundabout. The Kingwood Pike is in horrid condition how about you use those funds to fix the roads? How do you expect busses to safely transport students? You don't think their lives will be at risk? Turning onto Aaron's creek is bad turning onto the Pike from Aaron's creek is deadly. How do you think the home owners on the side roads will feel? How do you expect emergency vehicles to get where they need to go efficiently and safely? This plan is going to adversely effect the lives of thousands of people. Ask the residents- we don't want this! We work hard and pay taxes that we don't want used for this! Have any of you in favor bothered to drive up the Pike and travel those side roads? I beg you to do so and reassess.
303	How long will the Temporary closure of Kingwood Pike be? And, will the alternate routes, a.k.a Aaron's creek road, be paved before Kingwood Pike Closure? Aaron's Creek is less than suitable for this expected heavy traffic use. Will Lower Cobun Creek be open to traffic by then? And will it be paved as well? Again, this is a less than suitable road for heavy traffic.
304	As a user of this area 4 to 6 times a day, i like the preferred chooses and urge the project to move forward.
305	Why is DOT not answering questions about the economic impact of the project on the food supply of the community garden, CBD WV hemp farm, and an heirloom food and seed farm? This is fraud.
306	I would like to see option D for kingwood pike intersection.
307	The historical assessment is incomplete regarding the Dorsey Plantation.
308	This is Dewey Hastings calling. I'm a landowner and always never notified about this meeting. Perhaps you've seen the Progressive commercial where all the agents are trying to talk over the screen. They will not allow me on at this time. So can you see me now? Can you hear me holding a virtual meeting is an acting like it as a fact of boulder dash is based on lies and your reality. I'm glad to have no part of it. It's not being notified. My daughter presented me with a thousand page document over the weekend. I want to let you know that I'm totally disabled and the fact that you never return my calls through the stall or service department of highways is very disappointing. I am your document of a thousand pages does not address any of my questions that presented in April 16th of last month my way engine here, which I spent two hours with Chad offer. Excuse me of an impact your last name correctly l o w t h e r by the way Mister sites, you do have 15 seconds for me. You couldn't wait to get back on the road at the end of that meeting my concerns of address with the engineer Chad was lack of judgment as to when a rogue is next to the retaining wall. I suggested that you get a Lancelot map. I noticed some of your photos didn't show Landslide Maps. You can't put a highway next to a retaining wall. That is perhaps three times in my lifetime since you've built the road. That's the lack of judgment on your behalf. Second issue was mr. Sykes. Drainage there is no drainage on that corner. I thought was she would over seven to

	nine years about the water that you were dumping on my heel and I went to the person $7,000 to run the drain from the roof $8,157 because you neglected to help mean 3rd was wage access to my remaining land. I want to have access to that. I may develop that land and not just be totally towed off. There is no other access of life except through that Circle and I was counting on Chad to contact me since last year two hours. I spent with nothing wrong with the access. I need Road access water access storage lines Power and Gas those utilities could never go across after you put the circle. How old is the value of my land nobody is willing to communicate with me. I'll give you an offer over a decade ago or two million dollars. Excuse me, 1 million dollars for two acres approximately my lamp here ticket. Yeah, the issue was right away. Your diagram describes 81 the king would take us a 60ft since Nineteen Hundred 4081 has been a 30% right away. If you might refer to your records or do your homework, mr. Sykes the department of highways attempted in two thousand and two to say there was a 64 right away and I'm like you do your homework. The project was s +33-181-634-0000 parentheses. Oh seventeen. If that's not enough you can look at the ones that you call me 715-583-1255 plan for their Pump Station. That's 1971 at that time. It was 30 ft off. Thanks for bearing with me. By the way, it would be nice to have someone call me back. It's been a year year thousand page document doesn't address my problems. Why was I asked the other meeting is virtual meeting is a joke my father woke up. I spoke to him Saturday. He couldn't sleep all Friday night. Because he sees this as an opportunity for you to develop some basically land and needs very little prep and put a giant Circle in a ten million dollars from the sockel from the taxpayers. This site doesn't require two million dollars. You could build the Rockefeller Center. How much of that ten million dollars is this company making? Anytime 681-404-9491. My address is PO Box 172, Morgantown, West Virginia 60172. Once again, I was never notified of this. sure egg
309	Why haven't you asked questions from the last meeting? IN-personal comments were not represented.
310	I can't hear anything. I can't voice my opinion.
311	No Build Alternative! Use the Money $$$$$$$ to Fix the road in the WV that could use it!
312	My grandparents are having trouble dialing in.
313	The corner lot is in the city of morgantown. The citizens have not been included.
314	The historical organizations in Morgantown misrepresented the land zoning. The roundabout plan is located on land that is zoned in the city. Land that is also part of a 120 year old farm.
315	I don’t feel the virtual platform allows for discussion of issues as would be allowed in a public in person setting. Overal I am very disappointed with this meeting.
316	My name is John and I was wondering to say the Hastings wouldn't sell Sheetz that property. Why would you want to let the States steal it why would they want to stick to steal it? I bet after you steal their life and you put a Sheetz in cuz we all know Sheetz is a government-run company. The Hastings have a business on that land that pays taxes to the state which means they are productive members of this Society. There's no school right now. Anyway, and I doubt after this whole life parents will ever let their kids back in the States run schooling and indoctrination. I say leave the road alone or put a turning lane in those are the only options and the discussion with you guys are completely overreach yourself. Thank you for listening to my comment.
317	The project milestone for complete Approved Environmental Assessment August 28, 2020. Is misleading the public. The EA is false and dated information. The milestone should be revisited. This is unethical.
318	"preferred option"....preferred by whom??

319	So it’s a sidewalk that connects nothing whatsoever...???
320	these traffic improvements are minor but the project destruction is HUGE
321	Has there been a post construction assessment done on the effectiveness of previous roundabouts built in Morgantown?
322	can you repeat who will be impacted by each alternative?
323	Why aren’t any of my questions being answered?
324	The Fairmont roundabouts were constructed properly in a suitable area for a roundabout. I specifically asked about the ones in Morgantown.
325	The Roundabouts are expensive and dangerous. That was an incomplete answer.
326	Yeah, this is Dave. I'm worried about you know, you guys say there's endangered species and nude image of research about this roundabout and animals, but there's more than just the Eagles box and stuff out there. We got ducks and geese we got deer frogs possums raccoons cats fish coyotes. We got all kinds of stuff out there. You guys just keep pushing pushing all the animals out of here. You guys you guys are supposed to put a playground up on Dorsey Avenue and you build houses you let that guy build them houses up there, huh? And I thought you were supposed to you come down here on the mileground and now they're tearing down all the trees and stuff. So what about them animals? Huh? Did you do your research over there? You just tearing down all the trees over there for nothing for some houses with the doctors. It's ridiculous. I we've had enough of this land grab Behavior. We're tired of it. We don't want to round about you put a turning lane in whatever. We don't want the roundabout. We don't want it. It's not I live up here by this round about you put up there on the mileground. I tell you it's a god-awful thing. It is pitched the wrong way the engineers that built it are completely incompetent. Whoever built that roundabout completely incompetent. That thing is pitched. I mean the grade of the pitch when you go around it's dangerous. It's just too dangerous if you're going to build something. Can you just build it right when you build something? You do it it's slop it just so sloppy. Everything is just so sloppy in this town. When you people do something. It is sloppy. We got a lot of rooms that need fixed. We got a lot of things that need fixing. We need sidewalks these things that are called sidewalks and you're going to put in more roundabouts. Are you going to put aside walk around that roundabout? No, you're not. You're just going to put in more real more concrete cuz you want that Federal money, huh? You need that Federal money so you can get bunch of jobs all we need jobs. That's great, except the jobs going to be over in about two years. It's going to be a two-year job. And then well what else can we pair up so we can drive around and people down there driving on the green bag or a bunch of lazy bums. Anyway, you drive drive drive. Nobody want to walk there. Everybody's driving lazy bum wage. You can't sit there for five minutes and go to like lazy bums should put it back to a four-way stop the way it was never had a problem with that. You would wait wait your turn and then you go but we're so lazy and it's Todd. Completely lethargic. I'm sorry. I just had to speak my mind on that. I just think I just think whoever built these things around here is completely incompetent. I'm sorry. I'm really sorry. And you know, we pay all these money all these tax dollars and we don't got nothing out here for the bunch of it's a joke. It's a joke. You guys need to do better. You need to do better by the people who own the land and not us we own the land. We own the resources. Thank you very much. Thank you.
327	This roundabout would on a steep grade. The pike is a mountain by the way.
328	My name's be I don't want all about that screen backwards against house. Thanks.
329	Hello, my name is Ted Hastings. I was waiting on home as a speaker. I press star three at the beginning of this phone call and wage. I waited on hold for over an hour and half and at 7:45 15 minutes before the end of the meeting. It was addressed that you would not be taking last phone calls off. I had a locked it I wanted to ask and talk about and I feel shorted on my time. I also want to let you know that I know of three other people that had called in and I am unable to speak because they to dial Star three and they have since called me being like I can't get through and they're not answering my phone calls. And then now it's 7:45 moderator address that we would not be taking live calls. And I was

	just wondering why that was an option the whole time during the meeting if you could address that for you getting I'd appreciate. We went ahead and applied law enforcement that we think there might be something going on because we we've been waiting to talk for over an hour and half and nobody addressed it. And then like I say 15 minutes before the meeting is over. You said you're not taking live calls. So I went ahead and press the star button decided to leave a message. This is my message, and I'm just wondering why the end of the meeting new address not taking live calls, even though people have been trying to call and live the entire meeting. My name is Ted Hastings, and my phone number is 681-285-9922. Please call back for a response. I'd appreciate it. And also we called 911 Mecca at 6:25 and talk to operator 919 covid-19 about the fact that we had been waiting for such a long time and then over an hour later. You all said that you're not taking any lot. I just wanted to let you know that stock and then I appreciate wage. Thank you.
330	I have driven the Greenbag Rd and Dorsey Ave for the last 38 years and continue to drive it daily. As a former land owner on the Greenbag Rd, current resident of South Park, contractor at a wellness business on the Greenbag Rd, and whose children attended both schools on Mississippi St and Greenbag Rd, I have consistently observed that the only Major back up occurring has ever been and continues to be...on the Greenbag Rd between the Atomic Grill and Mississippi St. I have never experienced major back up of traffic on...Kingwood Pike-Dorsey Ave-or Greenbag Rd to Aaron's Creek Rd. As a regular traveler of the roads in question, I support a TURNING LANE going between the Greenbag Rd (at Atomic Grill intersection) to Mississippi St. Thank you for the opportunity for we the people of Monongalia Co. to have a voice on what would affect us daily.
331	Has there been a public poll to see if the local population is for or against this roundabout?
332	you said a "season and a half to two seasons;" is that meaning fall/winter or two years?
333	TAKE ACTION: There is an online petition on change.org against the massive destruction of healthy farmland for a huge earth scaring roundabout.
334	Shame on US. We the people demand better for our citizens and our farmers.
335	I support a Turning Lane between Mississippi St and the Dorsey Ave/Greenbag Rd/Kingwood Pike intersection.
336	No Build Alternative
337	Very disappointed.
338	Please read the tables. Some people can not see the documents.
339	This meeting was no where fair to the citizens of Morgantown!!!
340	Option F is a one letter improvement>>?
341	That's crazy
342	Why was archaeology survey report an abbreviated report instead of a full report?
343	I am strongly against adding a roundabout in the intersection of Dorsey and Greenbag Road. That intersection benefits from the traffic lights and would be improved if there is a turning lane and/or turning traffic light. If possible, expanding Lucky Lane would help with those trying to turn onto Dorsey and Greenbag. Roundabouts in this area is not intuitive to most drivers here. People have continually proved themselves completely unable to properly use the roundabouts at 705 and the Mileground. What makes this roundabout different in terms of performance? It gives little confidence that adding a roundabout in the intersection of Dorsey and Kingwood would benefit the area. The alternatives for turning lanes (options D and E) or adding a turning light would vastly help if improvements had to be made.

344	The round about at the traffic light is welcomed. The morning and evening traffic hour can be very congested. There are several accidents at the light for those who are crossing lanes. In recent years a pot farm was created which is more than disturbing. They often burn the pot in large onsite camp fires. The stinch spreads through our entire region. I'm not sure how they received a permit considering a school and prison is nearby. If you acquire property from them I'm certain it wont be missed by the majority of residents. Please proceed with sidewalks as people are often walking the busy road with little room to dodge traffic. Night walkers are especially concerning with no room to get away from oncoming traffic. Lighting is limited.
345	No roundabouts in general
346	Will the roads that will be alternative routes be upgraded to sustain all of the extra traffic that they will endure?
347	Please proceed with the project and roundabout. It is much needed for that area and to support future growth. There is no need for a red light at that location when alternatives exist.
348	Phone call to WVDOH requesting additional information. Summarized by WVDOH: Mary Hastings wanted some info on the project, as well as to let the WVDOH know some things about her property. Her family has farmed the area for 120 years, and this project will demolish her entire hemp farming business. Her father owns the entire farm, but this project impacts her business directly. She wanted to know the difference between the study area and project area, the EA/FONSI process, and the FHWA guidelines for public meetings. She thought that the virtual public meeting process did not adequately address the public comments and concerns and is hoping for another meeting, as well as a revised EA to address what the current EA is lacking, in her opinion. She wanted information on the historical reports and wanted to know why there are redactions,. She asked for FOIA information so that she can see the reports in their entirety, which I gave her. She also mentioned the Kennedy Center Federal Correctional Institution, and said that when it was built there were artifacts found there that are now in the Smithsonian. She wanted to know why there weren't artifacts found within the study area.She asked about hellbenders, golden eagles, and wetlands and mentioned that they would all be impacted by this project. The call ended with her saying that she appreciated me listening to her concerns. She said that they had several environmental firms they were in contact with and that they may do their own Environmental Assessment.
349	I wish to file a complaint against the moderator of the Sept 29, 2020 - 5: pm public comment session by the WVDOH regarding the Greenbag Road Improvement Project. During the presentation, the moderator refused to read negative comments/questions that pertained to the proposed roundabout construction. In particular, the devastation to the non-profit organization, Conscious Harvest Cooperative, and the local business Joy and Hemp Universal LLC did not receive significant attention in the meeting. The Environmental Assessment also failed to consider either of them to be a "business" that would be displaced by the roundabout. This is a great injustice and clear discrimination against these local businesses/organizations. I am infuriated by this blatant disregard of the community values.
350	Public comments weren't heard: 1. The chat window was inaccessible to some for the entire meeting. 2. Live callers (*3 option) weren't taken AT ALL. I spoke to multiple people who were unable to comment because they wanted "in que" for hours…[end of message screenshot]
351	Lengthy comment summarized: Writing to share opposition, feel citizens are not being represented. Two public meetings for the project. Deadline for public comments is 10/29/2020. First meeting most were against this proposal. DOH has not listened. [quotes from EA and links to documentation] The MPO and city want to remove truck traffic from downtown onto Greenbag Road. [link to news article] Roundabouts will do the opposite as truckers avoid roundabouts and roundabouts are less safe. DOH was planning roundabout in Sabraton but pulled after comments. Now left turn lane with arrow. Why add 2 roundabouts to this truck route? Residents are concerned about the proposed detour, Aarons Creek Road is one lane and potholed. No way to detour 1K people on Aarons Creek for 2 year project timeline. Based on past history

	with DOH could be 5+ years for saving 5 minutes at the intersection. Only traffic at 5 pm. Hastings family is strongly opposed to the project. They would not be opposed to losing land for turn lanes if needed. Roundabout won't fix traffic. Traffic backs up only on Greenbag. Left turn lane with shorter turn lane than the 100 ft won't take homes. Changing light would work also. DOH engineers recently stated roundabouts don't work during heavy traffic, removal of new roundabout at UTC. [quote and link to news article] The wide sidewalks are overkill for the road. Don't know anyone who would allow children to walk along the highway. Rare to see pedestrians walking to Giant Eagle. Mon County levy in 2019 provides free bus service for all residents. Landlords get free passes for their tenants. MPO long range plan considered future growth and stated a turn lane would be sufficient. No mention of roundabouts. [excerpts and links from MPO report] Signal timing is not addressed yet MPO report stated it is an issue [excerpt and link from MPO report] Waste of 11+ million dollars for this project considering state of road conditions in the area. [photo of a pothole near Greenbag/Kingwood Pike intersection] Rest of road is in worse shape, slide repairs needed, roads worn to gravel base. Proposed detour route unsafe. MPO never addresses these important issues. Could use $11M to fix other problems than sitting at a stoplight for a few minutes.
352	To WVSHPO - I am reaching out concerning WVDOT's recent Environment Assessment (EA) for the Greenbag Road Project in Mon County. I have been informed by DOT that the EA has already been reviewed and approved by SHPO. Since it was just released to the public and the landowners I have just started my review of the EA. There appears to be significant information missing in the EA related to the "Patton Farm" which is my family's (Hastings/Smith) farm for the last 118 years, also commonly known historically as the Dorsey Plantation. I am concerned with the incomplete and inaccurate of information in the Historic Property Information Sheets. For instance, the info sheets identifies features of the house that have been removed, but in reality the house is in the process of being restored and historical features such as the porch details are being rebuilt and repaired. Therefore, these historical features will be on the house will in fact be intact when it work is completed. Also the two oldest buildings on the property: The Coal House and the Spring House, are not complete in their descriptions. I would ask that the historical references related to this project be reviewed by SHPO for accuracy and completeness as I believe this property could be eligible for listing in the National Register of Historic Places (NRHP).I am available should you have any questions or would like more information as my family has maintained this property as active and productive farmland since 1902 and my 95 year old Grandfather is still with us and is very knowledgeable about the history. Also, a couple weeks ago we found a penny from 1891 in the front yard.
353	I have a few concerns about the round about at the bottom of kingwood pike. The reason your getting a lot of traffic to that intersection is because everyone from Preston county/ reedsville/ arthurdale/ kingwood area use this route to get back and forth to work my suggestion would be to put on and off ramps on the bridge for the interstate and you wouldn't get any traffic coming down to the 4 way. I also heard the plan is to use lower Aaron's creek rd and summer school road for the detour I would advise you to travel these roads before you consider making those roads a detour. Aaron's creek road is not wide enough for the big trucks that travel up the kingwood pike on a daily basis and the little bridge they would have to cross to get back on the pike is not made for bigger trucks it would collapse. Summer school road in the area of east gate the turn is not big enough for tractor trailers to make the turn I'm guessing 10 tractor trailers a year get stuck on the turns and have to be towed back to the entrance of summer school road and route 7 I've looked at the bridge and you have plenty of property to put on and off ramps on the kingwood pike. Traffic will be bumper to bumper between 2 roundabouts it's not going to work.
354	The farmland that would be taken as part of this project is a community treasure. The Hastings have opened their land for use by the community, many of whom would not have access to land to grow gardens and farm if not for the generosity of this family. Please reconsider either the positioning of the roundabout or the project altogether. Many families and individuals rely on this property remaining intact.

355	There is no real need for a roundabout at the intersection of Kingwood Pike/Greenbag Road in Morgantown! There are several businesses with large trucks that travel the Kingwood Pike daily and a roundabout would be so inconvenient for those businesses, hard for those big log trucks to get through daily! We need a 4 way stop put back in or a turning lane to go up the Kingwood Pike! A roundabout in this area is just not needed! Please listen to the people! Everyone already complains about the roundabout on the Mileground and about how much everyone hates it being there! Please we do not need this at all!
356	Just because you can do something never means that you should always do it. There is no need for a roundabout in this area, there is no want for one. you have a farm that is essential to the area and you will destroy it because you simply have funds you need to use by a certain amount of time? preposterous. the DOT of oregon should be ashamed.
357	No roundabout
358	We DO NOT need a roundabout at the kingwood pike/Greenbag intersection. Traffic would move much smoother if they would just widen the road and add turning lanes to turn onto Dorsey Ave and Kingwood Pike. This is the only area left in our town with light traffic and easy patterns for the elderly. My grandmother is 82 and will only drive this stretch of town because it's easy to drive.
359	So I have an issue with the widening of our street Luckey ln, I would like to talk to someone about this in person. But I'm going to make a long story short, I had to fight to get ONE speed limit sign up bc people FLY on this street but they said the other way would require the state to put a sign up cause in guess half is city half is state. Anyway the sign is Useless anyway as NO ONE obeys it and I've told multiple cops it needs to be watched for speeding however they NEVER DO. I have kids and they school is on this road and not only do me and my family have trouble with the speeding and our safety having to get in and out of our cars and driveway but the busses and pedestrians from the school have the same issue even the principal agreed with me that speed bumps should be placed. So that's where I'm going with this, the state and them told me they won't put them down for whatever reason. This road needs speed bumps placed bad! And EVEN MORE so now bc of you guys widen this road it's going to be so much worse bc people won't have to be careful and slow down sometimes when they meet head on traffic. Please I'm so over worrying about one of us getting hit or kids and or school busses having this problem, I don't see how it's that big of a deal to put speed bumps down, atleast from the stop sign (that many people run constantly on top of speeding) to the stop sign that meets Dorsey ave in front of the church on Dorsey so I'd say like 4 speed bumps ATLEAST 3 would do well. So again from the intersection of Dorsey and Luckey lane up to the stop sign for the school in between family dollar and the school please please!!!! Thanks you
360	During the online presentation your response to my question of shifting roundabout towards the former Atomic Grill location was that it wasn't feasible due to necessary retaining wall and additional property acquisition. I have more questions regarding the roundabout concept. 1) your roundabout concept shows a complete re-alignment of dorsey ave / kingwood pike at and before the intersection. please explain in detail how maintaining existing alignment is not less costly. 2) Will you not need a retaining wall on higher elevation side (across from former Atomic Grill) since your proposed future rd alignment uses up that entire embankment? 3) Table E-3 is confusing. Can you please provide a detailed breakdown of the estimated costs of Intersection options D,E, and F for Dorsey Avenue / Kingwood Pike Intersection, as well as total acreage impacted and # of landowners afftected by each of those options. 4) How exactly have you quantified the value of the community garden? Is it based on land appraisal alone, or have you calculated cost for the nonprofit to relocate operations, volunteer value (in WV, the dollar amount for volunteers is $20-22 / hour). 5) In the interest of a 3rd party review by another engineering firm, are the preliminary design / concept drawing files available? Since the comment period is coming to a close this month, a timely response to these questions is appreciated. Thank you.

361	I would Like to request the following: - Additional intersection alternatives because the current options have significant impact on businesses and farmland. - The corner lot at Kingwood Pike intersection IS in fact active and productive farmland. The current EA does not include these information community assets. -The livelihood of an entire family would be destroyed with the proposed alternative. - Additional due diligence as important economic and socio factors have not been accurately portrayed in the Environmental Assessment.
362	PLEASE DO NOT INSTALL ROUNDABOUTS ON GREENBAG ROAD!!!!! I am in full support of building turning lanes on the Greenbag road ONLY, and not on the KWP, or Dorsey Ave. Thank you.
363	The current proposal of the roundabout on Kingwood pike, will have measurable and irreversible damage on both environment, human, and economic opportunities. It is my belief that this community has not been properly supported with investigation of what has been deemed "insignificant impact" to the Hastings property and livelihood. I wish that the community I was raised in, valued the relationship with its community by empowering an equitable dialogue between property owners and those with decision making power. How the state of West Virginia has handled itself within the "open forums" addressing the proposal of the roundabout, is an abuse of power.
364	To Whom It May Concern: The proposed roundabout is unwelcomed by over 200 residents. The Hastings farm provides the community with organic pesticide free vegetables, medicine, and jobs. The community garden section is farmed, and the vegetables are sold to the locals. If traffic flow is the issue then it could be corrected with the addition of turning lanes off of Greenbag Rd. If passage for large trucks is of issue, then the S curves prevent this roundabout as an option. Please also consider this land has been farmed for over 100 years, and the fertile soil is precious. The Hastings also have a historic farm house on the property that would be a shame to lose. The old Atomic Grill building at the four way intersection could be used to plan a new road. Businesses never seem to do well there but, the family farm is going strong. Thank you for your time and consideration to this matter.
365	I have spent hundreds of hours in the field working and observing traffic. There is only traffic twice a day for about 30 minutes and the only back up is on green bag road, NOT Dorsey. We only need a turning lane on green bag road. As far as redirecting trucks is concerned, the trucks will not take that route no matter how nice you make the intersection because of the s-turn on green bag road between giant eagle and get go gas station. These proposed roundabouts are an absolute over kill, a waste of money, and completely unnecessary. Please reconsider this egregious over step and save us tax payers millions of dollars and save nature from being destroyed under the guise of progress by installing turning lanes only on green bag road and no roundabout.
366	Against roundabout on Greenbag Road!
367	I am strongly against a roundabout. Sending traffic down Aaron's Creek Road is NOT a viable option.
368	Turning lanes would work a whole lot better than a round about!
369	I'm not for the roundabout

370	The Kingwood pike DOES NOT need a roundabout!!! Adding turning lanes would just be perfect!!!! Aaron's Creek Road is a cow path and you want to detour traffic that way, stupidest idea ever!!! My husband is a logger with s very large truck, can you imagine him trying to drive Aaron's Creek with a load of logs, pretty much a one lane road, what's he to do when he meets a car???? School buses, they are large, and again trying to detour them to a cow path with a load of kids, AGAIN, STUPIDEST IDEA EVER!!! The winter months that intersection is even more dangerous for these larger vehicles with ice and snow, how do you expect them to do with a roundabout?????? This just isnt a practical solution!!!! Keep the red light, add turning lanes, leave the rest alone....
371	No to the round a bout
372	I do not support the roundabout. I travel this area daily and am very familiar with roundabouts on the Mileground and in Fairmont (as well as those in D.C.), and one is not needed on Greenbag Road. What is needed is significant improvement of the road, especially on Kingwood Pike from this intersection to the bridge. It could be that the subsidence has finally been addressed, but the drainage and pavement are atrocious. Please fix these issues.
373	Greenbag rd. Needs turning lanes with a light with green arrows. NO ROUNDABOUT!!!!
374	No roundabout
375	Against Roundabout
376	No
377	No roundabout at the intersection of greenbag rd and kingwood pike. Just add turning lanes.
378	No roundabouts just turning lanes.
379	Roundabouts don't work. Turning lanes only. If not turning lanes LEAVE I T ALONE. The road up the pike sure needs attention first. Fix the roads first.
380	The roundabout is not needed. They do not function in high traffic areas. The two in fairmont work well because traffic flow is not as heavy as Morgantown. People cannot drive in Morgantown to begin with, let alone adding in another roundabout. Adding turning lanes would suffice and not take away as much property as the roundabout.
381	NO ROUND ABOUT. WE DONT NEED IT
382	Absolutely no roundabout! It will make things worse for that intersection. It works just fine the way it is!
383	I say no to the round about. Fix the dang roads and possible turning lanes. But no round about and leave the farm alone
384	Yes, yes, yes think it would be a wonderful thing to have helping with the flow of traffic. Especially during rush hour times!
385	I say YES it would be a big improvement for traffic
386	No to roundabout
387	No roundabout useless money spent its to dangerous for that area turning lanes will be all needed with turning light
388	I'm in favor of the roundabout
389	I'm in favor of the roundabout
390	This money could be spent by fixing the roads we already have. A round-a-bout is not needed. It is wasteful of tac payers money and then a family loses their farm. Then what will the state take next? Closing the pike and devouring traffic will get someone killed. There is nothing wrong with stop lights or stop signs, the end result is the same.
391	We dont need a round about there the one on mileground is bad enough amd dont work

392	This is not a good place for a round about. It used to be a 4way stop. There is now a stop light that works just fine. The roads leading into the intersection is what needs fixed. It is falling in. A round about is not going to fix that.
393	No roundabout
394	Against the round about! Please listen to the residents, the community.
395	I have lived all by the last 20 years on the pike, but also still drive it alot and don't see the need for taking peoples properties, its fine the way it is
396	No to the round -about
397	All we need is a turning lane not a roundabout. Use the money to fix the Pike all the pot holes and caving in road.
398	No roundabout
399	No to a Roundabout. It just needs a turning lane. Why waste Tax payers money where it's not needed. Spend it on fixing roads. Ty
400	I'd like to see the traffic flow better than it has before the traffic light went into effect, maybe the round about is the answer maybe not but the courtesy turn was working out years
401	NO round about!!!!
402	The Aaron's creek detour is not safe for the amount of traffic that will be traveling while the lower section of kingwood pike is closed.
403	No
404	NO
405	We've never had to have a "Roundabout" in all these years, so why should anyone think we need one now?!!! Instead of spending time and money on something that almost everyone is against, how about fixing the roads that already exist?! For the sake of humanity DO NOT put a Roundabout in! Thanks for your time! Have a great day, & Stay Safe!
406	No round about. Put in a turning lane.
407	I live on the Kingwood Pike and I am totally against the roundabout at the intersection of Greenbag Road and he Kingwood Pike. First, there is no reasonable alternate route to use during construction, second, it would take farmland from a family that has owned it for years, third, this intersection is really not that much of a problem traffic wise. It's only busy during rush hour times. The money would be better spent to actually fix the roads instead of putting in an unnecessary roundabout.
408	I am not in favor of a roundabout at the intersection of Kingwood Pike and Greenbag Road. It is unnecessary and would create a long term major headache for all of us who live on and travel the Kingwood Pike on a daily basis. There is no feasible alternate route to use during construction. The traffic is not that bad to warrant this. The money would be better spent to actually repair the road.
409	No roundabout on the Kingwood pike
410	Yes please
411	No roundabout!! This would be so dangerous for the logging trucks coming off the Kingwood Pike. Also, this would be so confusing for all the elders that drive this road daily. PLEASE NO ROUNDABOUT, THIS WOULD BE DISASTER IN THE MAKING!!!
412	WE DO NOT! Support this "so called improvement"on the green bag road . For one if there is enough money to waste on a junky round about,then how about you come up the pike and fix our road first. secondly,there is no safe nor sufficient detour roads to get to and from our homes.thirdly,with it would being turned into a round about would cause a wonderful family to loose their farm land,which they use as their lively hood and to take away from this family could cause them to

	loose everything not just a piece of farm land.If you feel the need that you HAVE to do something to a road that functions just fine other than (idiots) out there , then out put a turning lane in.A turning lane will be an,agree to disagree situation.I promise you.And again I bring up my biggest concerns that I brought up last year! We see how icy and tilted the round about gets upon the mileground/705 intersection and its fairly flat ground,you tell me how can it be safe to add a round about on the side of a hill on a road that never gets touched by DOH in the winter time anyway and you have all these dump trucks,mac trucks,ect. Coming off the hill on an icy round about and someone in a tiny car in front of them with children in the vehicle ,you tell me how that situation is going to end?Ive heard that the one that brings in the ideas to "enhance" our roads aren't even from around here , they come from bigger cities.Yes in big cities im sure these work and as badly as you all want Morgantown to be a big city,IT IS NOT! it is a tiny town being forced to be a big city! That is all from me for now.But ,please just stop the nonsense and put a turning lane in or leave it be completely! Sincerely a concerned citizen that this will effect!
413	No roundabouts! Fix the Kingwood Pike roads that are falling in.
414	NO!!! I live in Reedesville and work in Morgantown. Not only to I travel that way every morning and evening, but my office sits right behind the old atomic grill. It would disrupt so much for not enough gain or need. The farm there would be affected. Bad idea and traffic doesn't even back up that bad there. Roundabouts are for places with a lot of traffic that needs moved through. There's a small wait there at the end of the day and it moves just fine. NO! NO! NO! To the round about!!!
415	I am opposed to the roundabout at the bottom of the Kingwood Pike. This is disrupting a family farm!
416	This is not needed!
417	No roundabout
418	Putting a round about at the four way at the bottom of the Kingwood pike would be completely assanine. And it would ruin a family farm. The traffic there already flows well. Why waste tax payers money on a stupid round about that never works right anyhow and cause more traffic back up like the mile ground. Or like the supposed round about to go in at sabraton, now that road is just messed up.
419	We do not need a roundabout at the end of the Pike. The one on the Mileground is horrendous and is always backed up. There are too many big trucks, not to mention school buses. Won't that be fun to watch? Just accept the fact we need turning lanes. That's all!
420	No roundabouts just turning lanes
421	No roundabout just turning lanes
422	No roundabouts just turning lanes
423	Round-abouts are a waste of tax payer dollars and do not improve traffic safety any more than a turning lane. Eminent domain is nothing more than government sponsored theft from citizens.
424	Yes!!!!
425	Yes!!!!!!!
426	Totally against the roundabout!
427	I feel the money would be better spent on fixing the current roads, there is no need to add a roundabout at the bottom of the pike..as a person that drives it daily I've never had to sit at the light for an extended time...The traffic lights in town are way more difficult to get through without sitting for awhile..#fixwhatsthere

428	I feel it is not necessary to put a round about at the end of the greenbag road, I have lived here 20 years and have never had traffic issues except for when they adjusted the traffic lights. I have several elderly neighbors who will have no way out during construction because of arrons creek road being the only way out. I could also see many accidents happening.
429	I DON'T approve of the roundabout
430	A round-a-bout is a big mistake. I travel 705 every day to go to work. It always backed up in the evenings. What a joke. All that is needed is a left turn signal in the traffic light. A lot less of an expense. Aarons Creek Road as a detour is a joke. Have any one of you traveled Aarons Creek Road. Where are yo supposed to go if you meet a bus. Not enough room for both vehicles.
431	Please find an alternate point for future roundabout consideration and not through an established historical farm and land which would not just rip thrpugh the grass and soil but their families and historical activity using food to help and aid others.
432	This roundabout is unnecessary. Build a parking garage for your students instead.
433	This doesn't seem like a great of my tax money, I'll take the farm instead. Thanks!
434	A round about is not better than a turning lane and this is going to take away people's businesses and family land.
435	Change any intersection possible to roundabouts, if this town/county is really serious about climate change they would remove as many red lights and stop signs as possible.
436	A roundabout is unnecessary and will take away a local family business.
437	It's a sad day that the people in charge feel we need to allocate tax payer dollars for a major road project that is completely unnecessary. You want to completely redo 2 intersections on one road that has traffic problems for 60-90 minutes total. Instead of "realigning" all these intersections (Earl L Core Rd x Greenbag, University Ave x Collins Ferry, 705, etc...) maybe we should take pride in the roads and systems already in place. Our roads are near obstacle courses. Dipping and dunking around pot holes constantly is a horrible look on our community. Yet we let this known problem continue because we want to waste money on new and unnecessary roundabouts. Not only is this a total waste of funds, you want to take away property from people who pay their taxes and own that land!? I've always lived in this town. I bought a house in this town. I love this town. But the constant brash decisions by our city council are ridiculous. WVU keeps buying (untaxed) land yet we want to build a roundabout for a building they purchase. Or out in a new street light because they build a parking garage. It's unfair the way our city council sells the rights of the tax paying people of our county. I can't wait to move out of City limits. I don't know why this would need to be repeated. But DO NOT TAKE PEOPLE LAND FOR YOUR SOLLY ROAD PROJECTS! Take care of the roads we have!
438	This letter is in response to the September 29th public meeting held by the Division of Highways for the Greenbag Road Improvement Project. Thank you for the Division of Highway's hard work in designing this project. The multi-modal improvement of the entire Greenbag Road corridor is a high priority of the Morgantown Monongalia Metropolitan Planning Organization (MMMPO). Greenbag Road is recognized in the area's Metropolitan Transportation Plan (MTP) as an important alternative to WV 7 for truck traffic and vehicular traffic. Greenbag Road also provides multi-modal regional mobility connecting the community to non-motorized transportation assets including the Decker's Creek rail trail. It is for these reasons that the MMMPO strongly supports the Division of Highways efforts to improve the central part Greenbag Road between Luckey Lane and Mississippi Street. We urge the Division of Highways to move forward with this project with all due speed. Thank you for your consideration in this matter.

439	The Kingwood pike DOES NOT need a roundabout!!! Adding turning lanes would just be perfect!!!! Aaron's Creek Road is a cow path and you want to detour traffic that way, stupidest idea ever!!! My husband is a logger with s very large truck, can you imagine him trying to drive Aaron's Creek with a load of logs, pretty much a one lane road, what's he to do when he meets a car???? School buses, they are large, and again trying to detour them to a cow path with a load of kids, AGAIN, STUPIDEST IDEA EVER!!! The winter months that intersection is even more dangerous for these larger vehicles with ice and snow, how do you expect them to do with a roundabout?????? This just isnt a practical solution!!!! Keep the red light, add turning lanes, leave the rest alone....
440	Greenbag rd. Needs turning lanes with a light with green arrows. NO ROUNDABOUT!!!!
441	All we need is a turning lane not a roundabout. Use the money to fix the Pike all the pot holes and caving in road.
442	Round-abouts are a waste of tax payer dollars and do not improve traffic safety any more than a turning lane. Eminent domain is nothing more than government sponsored theft from citizens.
443	I wanted to follow up with you regarding our recent phone call and your concerns about the Greenbag Road Improvement Project (Federal Project No. STP-0857(019)D; State Project No. U331-857-0.067; FR# 20-203-MG-2). According to our phone call, you are concerned that that both the architectural and archaeological reports completed in anticipation of the proposed Greenbag Road project are flawed and lack the proper level of detail to adequately document the significance of the resources in the vicinity of the project area. This included your family's farm, which was documented as the Patton Farm (HPI# MG-2646). In fact, the farm itself was inaccurately named based on your historical research of your family's property in and around the proposed project area. Because the resource was documented from the public access, details of the farm house, including its siding type, window conditions, and associated outbuildings were not properly recorded. Also, areas of former and current agricultural land included within the project area were recorded as previously disturbed when the only disturbance was that required by agricultural pursuits, and the agricultural disturbance does not extend below the typical plow zone. You have noted a discrepancy in documentation you have reviewed regarding the project where one report stated that shovel test pits (STPs) were completed on your property, but then other documentation states that the property was investigated for archaeological potential by using soil augers without mentioning STPs. It is my understanding that your family has found numerous artifacts, both from the prehistoric and historic periods, ranging from projectile points and debitage to buttons and cannonballs, specifically in land that will be directly impacted by the proposed project. There is also concern regarding the consulting parties/public comment portion of the Section 106 review process because, according to information you were provided, the Morgantown Historic Landmarks Commission (MHLC) was not notified about the project because the project is outside of the corporation limits. However, based on a lawsuit conducted by the city several years ago, your family's property was incorporated into the city in case future land use would involve development. You have been in touch with the MHLC, and according to you, the organization is now interested in the project. Because the public comment period is coming to a close, you are concerned that the project will move on before you are able to adequately document your family's architectural and archaeological resources and then not allow for a proper assessment of effect resulting from the proposed project. For my part, I described the difference between the Section 106 process and the National Register nomination process. I also explained that we would be glad to accept your updated documentation on an HPI form to allow for your property to at least be properly documented and archived. I will be forwarding your concerns to the WVDOH to be sure they are informed of your concerns and that our office may need to provide an updated letter based on the additional information we will be provided. As noted during our call, I cannot offer you any promises regarding how the project will move forward, but I will be sure WVDOH knows of your concerns. Hopefully this accurately summarizes our phone call, but please feel free to add to it or provide any additional information from our phone call that I may have forgotten. As I promised on our call, I have CC'ed our Senior Archaeologist, Lora Lamarre, because she will have to address the concerns

	regarding the archaeological portion of the review. Let us know if we can be of any further assistance at this time, and we look forward to receiving your additional information regarding your and your family's property,
444	I am writing concerning State Project: U331-857-0.67 00 Federal Project: STP-0857(019) I am a landowner that is effected and I have some concerns about inaccuracies about my property in the Environmental Assessment.
445	Comments provided via Senator Capito: 1. The state DOT has threatened to steal our farm…..where we have a lucrative hemp business, host other agricultural businesses, and run a nonprofit food program….in order to build a roundabout (greenbag road improvement project). 2. In 2006 a traffic signal was installed and A turning LANE was promised but the project ran out of money and never finished. Our extended family owns the other side of the road and the state could build a turning lane there (on the bad traffic side, and could use our extended familys land which they don't farm on and everyone would be happy with that-plus the state already has a right of way on that side.) 3. Traffic is hardly backed up, on one side, yet they want to spend over 10 million dollars and overbuild this roundabout, destroy our farm, when only one turning lane is needed. The 2-5 year project is egregious and will have detrimental environmental effects as well as noise pollution to the residences and businesses around them for HALF A DECADE?! One of those businesses is Bliss Bliss Bliss, a meditation and massage house of wellness- They Thrive on Silence for Relaxation. 4. Back to the DOH: They already have a right of way for the turning lane. They refused to acknowledge this land is a farm and attempted a Categorical Exclusion until we demanded an Environmental Assessment. 5. We believe the EA that they used was an old version from 2006 (dated facts, inaccurate descriptions) and we would like a new, actually finished one with updated information. 6. Due to covid they had a virtual public meeting but didn't answer one single phone call during the entire 3 hour period (even though a phone option was one of the options presented). 15 minutes before the meeting ended, they announced they weren't taking calls. This silenced the voices of least a dozen people (we have a list of them) that were unable to speak or comment at all because they waited on hold the whole time. 7. No one from the engineering firm, mmmpo, or DOT has responded to the landowners questions and even went as far to return a letter landowner sent, without signing it to receive it (certified mail). 8. I could go on and on but this farm is my family's livelihood. Our business is here. We have farmed this land for over 120 years - longer than Morgantown has been a city. Please we beg you for a letter showing support for our valuable green space. We fuel the local economy with our land, support farm to table with donations of food to poor families, it houses a non profit, share cropping, creates jobs and grows medicine. 9. We just want them to put in the turning lane we offered in 2006: use the right a way they have, save the state money, and save our farm. Please help us.
446	Letter to Emily Muzzarelli - Interim City Manager & Assistant City Manager Morgantown - The Land Reuse and Preservation Agency's Green Belt Connections Committee has been working diligently with local stakeholders, and specifically the Morgantown Green Space Coalition on connecting identified corridors that will benefit the city residents. The physical improvements of the proposed Greenbag Road Improvement Project, specifically the installation of sidewalk and a bike lane on Greenbag Road, will be help make progress towards the Committee's goal of community and amenity connectedness in the greater Morgantown area. The improvements offer a phased approach to the goal of a safe and efficient multi-modal transportation system that will exceed the seven National Transportation Goals. The Greenbag Road Improvement Project will create a needed pedestrian access point across Greenbag Road from residential housing areas to the north to Mountaineer Mall, Dorsey's Knob Park and Giant Eagle to the south. A future pedestrian crossing across Greenbag Road near the intersections in the vicinity of Giant Eagle and White Park will be critical to the community and provide an optimal transportation network for this southern corridor. The Land Reuse and Preservation Agency's Green Belt Connections Committee is available to assist in the development of transportation alternatives incorporating property and right-of-way acquisition in future development near the U.S. 119 intersection. While there is much more work to be

	done by the Committee and its stakeholders, we stand ready to provide our technical expertise and agency tools toward improving connectedness on and across this transportation corridor.
447	This letter is in response to the September 29th public meeting held by the Division of Highways for the Greenbag Road Improvement Project to provide comments on behalf of the City of Morgantown's Green Belt Connections Committee, a committee of the Land Reuse and Preservation Agency. We want to thank you for the work already put into this project during the preliminary design phase. Please see the Green Belt Connections Committee's comments in the attached letter. We hope that you take these comments into consideration and value the support for this important project. We urge the Division of Highways to move forward with this very important project. If you have any questions about comments provided, please do not hesitate to reach out. We would be happy to provide additional details on why these are so important. Thank you for your continued support of an improved transportation system in Morgantown.
448	This letter is in response to the September 29th public meeting held by the Division of Highways for the Greenbag Road Improvement Project to provide comments on behalf of the City of Morgantown. We want to thank you for the work already put into this project during the preliminary design phase. The City of Morgantown has long awaited improvement to Greenbag Road in the hope that this will alleviate truck traffic that currently plagues our downtown district via WV 7. We sincerely appreciate the attention to multi-modal improvements including intersection improvement, sidewalks, and accommodations for bicyclists. We continue to work on multi-modal connections throughout the City, and this is ever important on state owned and operated routes. While we support the overall project, the comments reflected in this letter are directly related to the area of the project that is within our jurisdiction, specifically around the intersection of Greenbag Road and Mississippi Street. This project can serve as a truck route that will benefit downtown businesses and add important pedestrian connections between schools and parks. We support the improvements proposed at the intersection of Greenbag Road and Mississippi Street. If the traffic engineers find that a roundabout provides the highest level of service, and they are designed in a way that provides safe and efficient through way for very large vehicles including tractor trailers, the City would be supportive of this design. I believe that it is important to understand the implications this has directly to the City. Our one and only maintenance garage would be significantly impacted by this change. We understand the importance of this corridor's improvement and can work to accommodate this taking if in the best interest of all parties and the overall project. We would like to see the proposed sidewalk or side path (currently proposed for the north side of Greenbag Road from Mississippi to Dorsey) to extend around the roundabout/intersection along the northern side of Mississippi Street. As you are likely aware, this is in very close proximity to White Park, the Morgantown Ice Arena, several baseball fields, M-TEC and South Middle School. There is a strong sidewalk and trail network in this area, and it would be great to continue making those crucial connections. The City could then prioritize a sidewalk project to "fill the gap" that would remain along Mississippi. This would allow for a continuous pedestrian connection between Mountainview Elementary School and the surrounding neighborhood to South Middle School and the great recreational assets around White Park. We hope you take our recommendations into consideration and value our support for this important project. We urge the Division of Highways to move forward with this very important project. If you have any questions about comments provided, please do not hesitate to reach out. We would be happy to provide additional details on why these are so important. Thank you for your continued support of an improved transportation system in Morgantown.
449	As I send this to you I do so from a different view. I support the work needed on the Greenbag Road in Monongalia County. I also hope that you can work as hard as you can to protect the land being used for farming. These young farmers are working hard to make a start of the family farm. Design to be as mindful as you can, move all top soil to a location they can use, design to disturb as little if any of the land they are using.

450	The Greenbag Road Improvement Project offers a timely opportunity to build infrastructure that will facilitate safe travel by pedestrian and cyclists while connecting neighborhoods to city parks, schools, and local businesses. The WVDOH website public input page notes, "This Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor...Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." To ensure that the Project meets community needs identified in the MMMPO plan, the Mon Valley Green Space Coalition respectfully requests the following modifications to the DOH Greenbag Rd Improvement Plan: instead of sidewalks, a multi-user asphalt side path should be built on the N side of Greenbag Rd along the entire length of the project area. This will facilitate use by both cyclists and pedestrians while offering a safety barrier between users and vehicular traffic. This multi-user side path should extend to the current signalized intersection of Greenbag Road and the Mountaineer Mall. The project should be amended to include a marked pedestrian corssing from the north side to the south side of Greenbag Rd. A designated safe crossing of Greenbag Rd. will serve residents from low-income neighborhoods who travel on foot and by bicycle to reach the grocery store. Such a crossing will also serve the community by facilitating the connection of two key recreational areas - White Park and Dorsey's Knob Park. A HAWK beacon (High-Intensity Activated crosswalk) at the current western terminus of the project would serve pedestrians and cyclists without disrupting traffic flow because it is inactive unless activated by a pedestrian or cyclist. The proposed roundabout at the interseciton of Greenbag Rd, Kingwood Pike, and Dorsey Ave should be relocated to the northern side of Greenbag Rd. Relocating the roundabout would displace a building that is vacant and preserve greenspace that serves as a community garden and offers significant ecological benefits.
451	Turning lane is all you need at the 4 way on greenbag road. The best option would be on and off ramps to the interstate. I've heard from some old timers that they have already been payed for years ago just was never put in because not enough traffic on the kingwood pike. If you put in on and off ramps on the kingwood pike you will reduce traffic off greenbag road and sabraton exit cause everyone has to use those routes to get to kingwood pike Preston county area. From the bottom of the pike to almost the i68 over pass is a disaster it's falling in needs a total repair. Aaron's creek rd and summer school road and cobun creek road cannot handle all the traffic that will be using the detour route those roads are to narrow for all the big truck traffic. You need to take a hard look into this before you make a decision. The best decision is gonna be the on and off ramps.
452	This is in regards to the open comment period for the proposed roundabouts at the intersection of the Kingwood Pike/Dorsey Ave/Greenbag roads and the intersection of Mississippi and Greenbag Road both located in Morgantown .I live near both areas and while I have experienced traffic congestion, putting in a roundabout to manage traffic seems like an excessive way to reduce or eliminate traffic congestion in both cases. Turning lanes and turning arrow at the Dorsey Ave/Kingwood Pike seem like a cheaper and less destructive alternative to fixing this issue. I would also like to see the plan for the roundabout at the Mississippi and Greenbag intersection re-evaluated to make sure this is the most economical choice and has least impact on the surrounding infrastructure. The traffic patterns here are only congested at certain times of the day and week (mainly when schools are starting or ending).
453	Review of EA by Downstream Strategies and Ltt Soil LLC - summarized: evaluated the EA for identification and loss of prime farmland; stream and wetland impacts; reasonable alternatives. Recommends corrections to classification of land use and designation of the Hastings property; provide information on post construction conditions of streams; quantify and mitigate for increased stormwater discharges; revised wetland report; quantify impacts to wetlands; include and analyze a new option wiht dedicated left turn lanes for the Greenbag Road with no added lanes for Dorsey and Kingwood.

454	Thank you for the opportunity to comment. God knows that Morgantown's road infrastructure is in very poor condition for a variety of reason; we need a much more 'fair' and egalitarian way to budget for and implement road improvement in the local area, one that is based on need, on our contributions to the state's taxes, and on our growth. The reasons that our existing transportation infrastructure is so poor include: poor design and construction; lack of maintenance; heavy truck traffic that is inappropriate to the design and maintenance level that currently exists. Therefore, with respect to the Greenbag Road Improvement Project ('Project'), I see it offering a tremendous opportunity to improve on the infrastructure that exists along the corridor, while allowing safe 'active transportation' (aka alternative transportation, aka non-motorized transportation, travel by cyclists and pedestrians) that will, if implemented, help greatly to connect neighborhoods to city parks, schools, and local businesses. I therefore applaud the WV-DOH in their ideas on the project, particularly those that support active transportation. Indeed, the Project …"is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor... Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." I would ask you to consider the following: A multi-user asphalt side path should be built on the north side of Greenbag Rd along the entire length of the project area. This will facilitate use by both cyclists and pedestrians while offering a safety barrier between users and vehicular traffic. There is plenty of room here to build a side path. This should be a priority, and it should extend to the current signalized intersection of Greenbag Rd and the Mountaineer Mall. The Project NEEDS to include a marked pedestrian crossing from the north side to the south side of Greenbag Rd. A designated, safe crossing of Greenbag Rd. will serve residents from low-income neighborhoods who travel on foot and by bicycle to reach Giant Eagle. Such a crossing will also serve the community by facilitating the connection of two key recreational areas—White Park and Dorsey's Knob Park. A HAWK beacon (High-Intensity Activated crosswalk) at the current western terminus of the project would serve pedestrians and cyclists without markedly disrupting traffic flow because it is inactive unless activated by a pedestrian or cyclist. Finally, due to the many significant negative environmental and cultural impacts that the proposed roundabout on the eastern end (at the intersection of Greenbag Rd., Kingwood Pike, and Dorsey Ave), I support passing lanes. Given the negative impacts on Aaron Run and Cobun Creek, and the loss of farmland of significant cultural values, I do not support a roundabout in this location. I have had a garden plot at the Conscious Harvest Coop since its inception, and I am fully aware of the incredible productivity, the aid to families that suffer from food insecurity, the scenic values, and the many ecosystem services that this (Hastings Farm) provides. Contrary to the EA, the soils there are very productive and their loss would be a significant impact that could not be fully mitigated, regardless of the method(s) utilized to do so.
455	I am writing to voice my concerns over the proposed idea for a roundabout being constructed for this intersection in Mon county. A roundabout is not the best solution for this intersection. A left turning lane with its own green arrow light will resolve the issue of traffic backing up at certain times of the day. Before the light was installed the intersection worked much better than it currently does but a roundabout is not the answer. Aarons creek road (where traffic will be diverted to for an estimated 2.5 years can not handle this influx of traffic. Not only is it in very poor shape (as are numerous other roads in our county/state) but it is a narrow windy road that will be disastrous come winter time. One person getting hung up will inhibit anyone that lives on that road or the people coming from the detour on the Kingwood pike from getting to town without having to back track onto even more dangerous country roads. For the price of 15 million dollars there are so many other roads that are crumbling apart and that money would be better spent elsewhere. Please come to Morgantown and the surrounding county to see for yourself. In closing, I oppose the roundabout project for this intersection.

456	I live on the Kingwood Pike in Morgantown, WV. I am sending this email to let you know that we do not want to see a roundabout put in at the intersection of Greenbag Road and Kingwood Pike. I travel this intersection daily. There is very seldom any traffic to speak of. Even at rush hour times it is not bad. This would cause a major upheaval to the residents of the area. It would make travel for us nearly impossible. There are no alternative routes that are capable of handling the traffic. Also, there is no alternative route that could handle the truck traffic on the Kingwood Pike. As well as taking farmland from a family that has owned it for years. Especially for something that is not needed. I saw a Facebook article written by Tom Bloom stating that he lives in this area and that this is needed. Mr. Bloom doesn't live anywhere near here. Not sure why he would benefit from this and why he felt the need to post this on Facebook. The money would be much better spent on actually repairing the roads and potholes. We do not want this.
457	Documentation of phone call with Diane Hall: She did not have access to a computer, or did not get any info by mail. I told her if she got me an email address (her daughter-in-law has a computer), then I would send her the link for the public input for project information. If not, I told her I would hard mail a copy of the handout. She said she would let me know. She is very adamant that the roundabout is giant waste of money and resources, and WVDOH would be better to spend money on our roads throughout the state. She said the Mileground is a terrible mess and this would be similar. She is wanting to know why we can't do something like we did at Sabraton, which is great in her opinion. She thinks that using Aaron's Creek Road for a detour is a terrible idea and is very dangerous for the travelling public. She also thinks this entire project is to get the traffic out of Morgantown and said that is bad for her community. She has lived on Kingwood Pike for over 40 years and said their traffic problems stem from WVU. She thinks the money would be better spent on traffic issues in town.
458	Documentation of call by WVDOH: Sasha is a Kingwood Pike resident and is very concerned about the project and thinks other alternatives need to be considered, besides the roundabout. I directed her to the public meeting page with the alternatives analysis, project plans, and project info. She thinks there is too much development already and the project doesn't make sense. I told her that was the reason for the project, to address the development in the area. She is extremely concerned with the project taking valuable farmland in the area, that has been used for the greater good of the community. She said there would not be as much reaction time with the roundabout vs stoplight and was concerned with ice during the winter and traffic issues. She is concerned about issues with standing water on parts of the project, as well as the road in front of the project falling over the bank. She said there have been repairs on this section, but they keep failing. The roundabout is a major concern. She said that speeding is very problematic there and was concerned that the roundabout would not address the problem, like a stop light or turn lane would. Also she is concerned with truck traffic in the area, with respect to the roundabout. The detour was a huge concern as well. She said that Aaron's Creek Road was very dangerous as is, and would not be a safe detour for anyone, much less the amount of traffic being detoured for the Greenbag Rd project.
459	No round about
460	No roundabout - Will hamper traffic into my business - Ruins a small local farm's business (on the corner of Dorsey and greenbag - Increased truck traffic noise impact the serenity of our spa (hurts another small local business). A few more stop lights would be helpful for flow but round about not needed.
461	As someone who lives right off of Dorsey and uses both intersections regularly, I admit that something needs to be done. Roundabouts are NOT the answer though. I think that the Dorsey/Greenbag/Kingwood Pike intersection would be best served by adding turn lanes and turning signals (what I had hoped for when the lights were installed to replace the 4 way stop years ago). At the South/MTEC Drive "T", I don't typically see an issue there except for at the beginning and end of a school day and there are traffic patrols keeping things moving then. Definitely does not necessitate adding a roundabout in my opinion as I have entered the T from all directions in the past and it was a non-issue. Please do not

	go with adding 2 roundabouts (& this is coming from someone who does see the value and knows that roundabouts are good at traffic control, but it is NOT needed in this case.) Thank you!
462	I don't see a pressing reason for a roundabout at this intersection. The tax dollars have other pressing needs that need to be addressed immediately.
463	I drive the kingwood pike to work every day and back. I do not have a problem with the intersection as it is, however I do have a problem with the city taking from the Hasting's family farm which would impact their business - Joy and Hemp Universal LLC.
464	Environmental Assessment (EA) has not identified a significant portion of Prime Farmland/ Farmland of Statewide Importance located on our property (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10), where Option F of the EA analyzes a roundabout traffic pattern. The current EA version available to the public for comment is incorrect with regard to the following: - The Prime Farmland soil determination for the existing condition of the lands within the limits of disturbance for the Hastings property (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10) is confirmed and can be found via the USDA NCRS - Web Soil Survey. - In accordance with Federal Land, a Land Evaluation Site Assessment must take place as stated by Farmland Protection Policy Act. - The EA incorrectly describes my farmland as disturbed previously. Which is incorrect. -This land has, and continues, to be farmed by me, in addition to other farmers, some of which who rent, as well as, one limited liability corporation, and one Non-Profit designated 501c3, all of which participate in agricultural practices and activities in that location. I, Mary E. Hastings, as landowner and Agricultural business owner formally request that the EA to be amended and reassessed to accurately reflect potential significant impact to the Hastings (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10) and other lands that may also be incorrectly assigned improper land use and/or other incorrect designation of farmland of importance according to the USDA NRCS Soil Survey located within the Limit of Disturbance for the proposed project in all alternatives. I, Mary E. Hastings, as land owner and person directly affected by the effects and impacts of the proposed actions in the WVDOH Greenbag Road Project EA, request additional Public Comments after the correction as to accurately reflect the demographic and public opinion of Option F.
465	Against the roundabout
466	This is ABSURED!!! No reason at all for a round about to be placed here, there is no safe detour route I do not feel safe on the roads they are so called using for detouring, I would have to go at least 10-15 minutes out of my way to get to my job to make a living and then on top of that have to put extra money into my gas tank for the extra driving, and extra money in maintenance because im not sure the last time anyone making these decisions drove on arrons creek road or summer school road but they are not fit for a dog to walk down let alone drive a vehicle!! arrons creek is not big enough to pass two cars through let alone all these hillbilly pickup trucks and a tiny car, you take a hint of which one will end up in the ditch at winter time on untreated roads!I dont know the family very well, that own the farm land you are wanting to take and destroy but I do know thats their livelihood and by you taking that away from them could cause them to loose everything!!!they also support surrounding area farmers that use that land for their livelihood as well and you could cause many families to loose everything they worked so hard for all their lives, how SELFISH of you if you go on with this!!! your uprooting everyones lives that live on the kingwood pike and surrounding areas and wasting so much money on this project when you could save it all just by simply flipping a switch and letting the light change on each side one at a time you dont even need a turning lane or turning light, then you can use all the money to fix the kingwood pike. The pike bridge is government funded so theres your money for that and then you can fix the bridge that you can look through and see the

	interstate below!! These people in the big offices its time to start thinking about the people you said you'd support and listen to when you were running for office ,nows your time to prove yourself, listen to the people we know what we are talking about believe it or not!!!
467	I'm appalled. Furious and beyond troubled over today's Dominion Post article. I want to know who gives the commission the right to approve the round about project! We the tax payers should have the say! The residents thats lives will be turned upside down! There's no good detour and if you think there is than I invite you to come take a tour with me on Aaron's Creek and Cobun Creek roads! Do you even care for the welfare of the children that will be on a bus on those unsafe, narrow roads? The trucks, commuter traffic and construction vehicles that will need to find alternative routes so this unnecessary, unwanted project happens? This is unfair! Let the tax payers vote! We oppose this plan! We deserve to be heard!
468	A roundabout is unnecessary on the Greenbag road. A turn lane, or even just a green arrow would be perfectly fine. A roundabout would be a waste of money and resources that would be better spent elsewhere. Also using Aaron's Creek Road or Cobun Creek Road to detour all the traffic on the Kingwood Pike is impractical. They are far too narrow and of poor quality to handle that much traffic.
469	I reject the proposal for the roundabout on greenbag road the detours are unfit for the amount of traffic detoured too many trucks take the pike and 4way intersection ridiculous to uproot working farms all to receive federal funding if you federal funding use it to fix the pike bridge roundabouts dont belong in this rural area they belong in big cities stop making unnecessary changes all we need is a turning lane this project will disrupt the lives of too many people for too long because we know this is a several year project listen to the people who drive this everyday dont listen to those who sit behind a desk and make things look good on paper thank you
470	I am appalled at the ridiculous idea of the round about at the bottom of the Kingwood Pike. It isn't needed! There are other options to improve the traffic flow that would not mar the beautiful country setting, destroy the farmland, and waste a fortune of money putting in a round about. Who wants this ??? Not the people who reside on the Kingwood Pike who travel that intersection, so who wants it? I live on the Kingwood Pike. Rerouting traffic on Aaron's Creek for the long duration of the project is hazardous. What about when an ambulance needs come to us, other VFD units, our school buses!! Listen to the people please!!
471	No
472	No
473	In continuation of my previous comment, Numerous mischaracterizations have been identified in the EA during the public comment period. The architectural and archaeological reports completed in anticipation of the proposed Greenbag Road project are flawed and lack the proper level of detail to adequately document the significance of the resources in the vicinity of the project area. We request additional time from the SHPO and the WVDOH to do proper STPs on the location impacted by the current project design in anticipation of findings. As previously described, numerous artifacts of a historic and prehistoric nature have been found and documented on the land directly impacted. We are requesting more time in the name of preservation to provide additional information to better information the project team and community

	on the potential irreversible impacts. In good faith, the community is funding an independent archaeology dig and plans to begin ASAP.
474	I oppose the roundabout at the green bag road intersection. It is unnecessary and will disrupt the Hastings farm land.
475	Please reconsider your decision on this matter. We need other roads fixed. Don't fix something that's not broken. Roundabouts are dangerous and never should be put in.
476	Why on earth would you take land that has been in someone's family for so long just to build a roundabout for an intersection that already works. This intersection has worked for years even when it was a 4 way stop sign. Stop trying to "improve" it just because you think it's going to be better. A roundabout is just going to cause more congestion like the mileground.
477	Placing a roundabout on Greenbag Rd is not a good idea and will not deter trucks from driving through town. The Kingwood Pike is not only dangerous but crumbling apart, money could be better spent on other projects such as fixing the roads with heinous pot holes in them.
478	Waste of money to put a round about on the Greenbag Road. There is not a lot of traffic on that road. And not to mention having no regards to what the land owners have to say. Basically stealing their land. This county is so greedy. The truck traffic will still go through town no matter what, they won't be forced to go Greenbag road. If this was any county commissioners land, I guarantee this project would not be happening.
479	I do not feel as though a roundabout at the bottom of the Kingwood Pike is necessary or safe. There is absolutely no need to take people's land to create a more dangerous intersection. While I understand there 10 million dollars available, I feel as though that money would be better spend reinforcing the part of the road that continuously slides and eventually separates. Ensuring the safety of the road and the citizens who travel it daily is more important that building a 10 million dollar roundabout. While I acknowledge there are certain points throughout the day where there can be a backup at that light, traffic would move more efficiently if the intersection reverted back to a 4 way stop or a turning lane was created.
480	I appreciate and applaud everyone's hard work balancing the many interests on this project. It is a very important one for the future of the Morgantown region! As noted in the main page for this project: "Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." While I applaud the DOH's work to include pedestrian infrastructure and some bike accommodations on the western half of the project, to not connect hundreds of residents and multiple businesses on the east side of Mountainview is contrary to that statement, and I hope the DOH will strongly reconsider the design from the Dorsey intersection eastward. I'd like to respectfully submit these points for consideration in the design: 1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative 5) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to

	public feedback as noted above. Thus, I strongly recommend (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a sidewalk or multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic (I've ridden that stretch with my 11 year old son, so we know). I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. I greatly appreciate the opportunity to comment on a project that will have a major impact on our area for decades. Many of us have been working for improvements throughout the entire region for pedestrians and bicyclists, and this corridor is a critical piece of the puzzle. Thank you!
481	Round about is a waste of time and money! Fix the potholes! And have you seen arrons creek, a detour on that road will be an absolute joke.
482	I've been using Kingwood Pike and Greenbag Rd for 40+yrs and up until the red light was added have never had problems at the 4 way intersection. Everyone kindly took turns to go and no problems turning left. Now it's a dangerous race to go left when other car is going left and people go around those cars turning left. Not impressed with roundabouts as Mileground has proven not successful during rush hr. If roundabout goes thru we will be forced for awhile to use dangerous Aaron Creek Rd. This rd is in bad shape and narrows to a single lane towards Kingwood Pike. No room to barely pull over to approaching cars. Then there's the fact that it will take us a longer route just to go to Gisnt Eagle, etc. How long will this detour be used? Progress sometimes hurts those citizens that use it the most.
483	The kingwood pike needs on and off ramps to the i68 over pass that would take away a lot of your traffic. Everyone now has to use the 4way/ green bag road because their is no other routes suitable to drive to get to upper kingwood pike/ Preston county. If you put in the on and off ramps you will not get much traffic at all on green bag road. Round about will be a disaster if a wreck would happen at either giant eagle intersection or the next intersection would be a major traffic jam in and between the roundabouts. Monongalia county has to many ways in and not enough routes out.
484	Please install a crosswalk and appropriate signage on Greenbag Rd at the Eastern entrance to Mountaineer Mall, connecting White Park trails to the trails on Dorseys Knob.
485	Please consider pedestrians, inlcuding crosswalks at intersections. The improvements to trails in White Park and Dorseys knob. It would be great to connect them. Please follow Complete Streets.

486	The proposed project lacks a key element--a pedestrian crossing from the north side to the south side of Greenbag Rd! The plan should be amended to include this element. In addition, a multi-user side path that extends the entire length of the project area is preferable to a sidewalk --a side path will facilitate use by cyclists, not just pedestrians while providing a SAFE route for children to walk or bike to school. Finally, roundabouts offer many benefits. However, community needs may be better served by relocating the roundabout at the intersection of Greenbag, Dorsey, and the Kingwood Pike to preserve the community garden.
487	Please provide a pedestrian crossing on Greenbag Road, near Giant Eagle, that will provide access from the trails in White Park, to not only the Giant Eagle grocery store, but also to Dorsey's Knob Park and Sky Rock. I am asking for the pedestrian crossing only. The connector trails will be built by the Greenspace Coalition, the City of Morgantown, and other local entities.
488	A roundabout at intersection of Green bag Rd and Kingwood pike is not needed and a big waste of Taxpayers money. A turning light is all we need. If they didn't need the Roundabout in Sabraton why would we need one on our little country road? Also the idea of Big trucks as well as so many cars detouring over Cobun Creek is a horrible idea! It is a one lane dirt road in most places. Ty
489	There is no need to waste money on a roundabout. Put in a passing lane like you did in Sabraton. The money you would save you can put an on and off ramp to Interstate 68 up at the pike bridge. Most truckers and people driving the pike need to get on interstate any way. Of course this would be too simple. How much is it gonna cost to make Aaron creek road usable for the additional traffic
490	My name is Steve Runfola and my family neighbors and I must use Cobun Creek Road to access our homes. We understand that Cobun Creek Road will be used as a detour for the many months or years of Green bag Road roundabout construction. My neighbors and I are very concerned that Cobun Creek as it exists now is seriously unprepared for heavy 2 way traffic that will include large trucks and other heavy vehicles. The DOH has posted a sign at the intersection of Cobun Creek and 119 stating that heavy vehicles are banned on this road. It may be knocked down at the moment but it should be there. The road is one lane with no pullovers and has terrible drainage in many places. You can literally watch while moderate to heavy rains rip this road apart and turn it into a real creek or sheet of ice. Any maintenance done on the road is destroyed in a matter of weeks due to the atrocious drainage. What are the plans for this road before, during and after the Roundabout construction? We also think it's a very good idea if The County and the DOT contact us if our area is to be directly impacted by major maintenance or construction. None of us had any idea that Cobun Creek may be used as a long-term detour and so no one that I know of attended the Roundabout meetings. My name and contacts are Steve Runfola M: 1-304-680-1340 Email: StevenRunfola@Gmail.com . Thank you for your service and have a good day.
491	If there is an intent to use Cobun Creek Road as a detour for any traffic as a result of this project, than we have a significant objection to the plan. We live on this road and it is already in very poor condition. It is very narrow with no ability to pull off/have 2-way traffic in most areas. The drainage is poor and causes wash outs and potholes after any major rain. During the winter, the road is poorly maintained and often is very icy as a result of poor drainage. Repairs to the road often last only a week or so because of the poor drainage, as well. The existing traffic, along with the dam construction traffic, already makes traveling this road difficult throughout the day. There are deep ditches which add to the challenge of the narrow road. It has already been deemed not suitable for large trucks and, honesty, is barely suitable for any vehicle. In fact, school buses will no longer even come down this road. In the ~15 years I have owned property off this road, it has consistently gotten worse each year. Added traffic would be unacceptable and would make it extremely unsafe and troublesome to the residents who must use this road.

492	Thank you for the opportunity to comment. I am opposed to the state plan to put a roundabout on Greenbag Road near the Kingwood Pike. This roundabout is unnecessary are unfairly takes a large part of a local family's cooperative farm. Money that would be spent for this project could be better applied by creating and maintaining sidewalks and improving existing roadways.
493	I am writing to state my opposition to the proposed plans to install two unnecessary roundabouts on Greenbag Road. These projects are a waste of taxpayer dollars. There are countless better uses for state money, including improving existing sidewalks, building new sidewalks, and improving existing roadways. Further, this project unfairly disrupts and takes away valuable land from the Hastings cooperative farm, which has existed for many years in Morgantown. No to these unnecessary roundabouts!
494	How in the hell are log trucks and extra long RV's supposed to head up/or down the pike with a round about.
495	I even sent Tom Bloom a message and he said they can't turn back.i said take the lights down put stop signs back up or just put in turning lane .this so sad il think people should have a vote on it .
496	Or just let one side go at a time and no road work needs done at all save the money to fix the pike!! I think its time to protest everyone else can over every little thing so why not us!!!!!
497	Fix our roads!!!that is so stupid!!!!!
498	Fix the roads we already have you would be better off.
499	Can't wait when it snows and we come off the Pike into a roundabout! (SARCASM)
500	Why pay property taxes, they just take your land anyway... sad
501	No one wants this. I've sent many messages, emailed, texts etc. i wrote an email to Joe Statler it was returned as undelivered and not accepted through his server. I'm printing and mailing the same letter tomorrow. No one wants this.
502	I've seen cars)trucks slide right through the intersection
503	They make money from every roundabout the build
504	It would be cheaper to just put in lights with an arrow, and put the money on fixing the pike, common sense, if they just knew how to use it, common sense .
505	I live 3 miles up the Pike. I think all is needed us a turning lane. Why spend all that money on something not needed and take someone's land. Smh
506	A turning lane was promised years ago. Never happened. Why we can't even get any potholes fixed. Nothing all summer — not even the big crater as you start up the Pike
507	What's the point in even voting for not putting this in if they're not going to even consider our opinions??!!!! This is a bunch of bull! They already had this set up and there isn't anything that anyone can do or say to change it, apparantly!!!!! I guess what the people want doesn't matter, unless you make it about racism or something!
508	Just fix the road don't need a roundabout on a pike
509	Why can't they just change the light to a four way stop like at the glenmark center
510	Have they driven Aaron's Creek for their detour. I mean really. you cant pass. How are buses suppose to travel it
511	Wait til busses all go arrons creek! That will be at least 25 extra mins. On a good day! If they still plan on the same work schedule of detours! What is wrong with a guarded arrow??

512	Check out the round about in Granville.millions of dollars and its coming out. Fix the roads we already have or put in a exit ramp for king wood pike off interstate
513	Fix the road not everybody happen ride down the Creek Road
514	I'd like to see how Corbin creek road is going to handle the traffic. You can't even pass on it now let alone all the truck traffic.'put an on and off ramp to interstate at the bridge. Cost a hell of lot less than the round about. But of course the commission is probably guaranteed a pocket full of $$$
515	Just wait until an ambulance is needed on the Pike and they have to travel Aaron's Creek to get here. Or help from other VFDs. Someone is benefiting from this ridiculous plan 💵
516	Pike is awful all the way up. Rough road! Also I've seen cars slide through intersection. And Cobun Creek us very very narrow. Hard to pass I a good day
517	Why dont we put a roundabout in the commissioners' neighborhoods? I bet they would stop that real quick.
518	The repairs to our roads is much needed. They are horrible. Since it is tax payers money , the people need to be heard. If they want to put a roundabout somewhere put it on 705at the Stewartstown rd. Leave the country rds. Alone.
519	People should be able to vote on this, roundabout, left turn signal light or leave it alone! My thought is leave it alone or left turn lights
520	The roundabout is a joke.These engineers don't have common sense. Just like on the mileground, the people coming from milan and hospital don't even yeild, they plow right through.
521	The engineers don't understand human nature or this area. It's not the usual excuse they always give... "people will "learn" the roundabout". Oh, they know the rules and don't care. I can't count the times I have been passed on a double yellow line on the Pike when I am going at or above the speed limit. The stop light is the only thing they stop for. Can you imagine what a roundabout here will be like?
522	those educated engineers have no idea. Bet they have never driven up the pike or looked into any alternative methods. They have their minds and pockets set on the roundabout and don't care about the people who live here. Let's just remember this the next election
523	All the hell it needs is a damn turning lane . And fix the freaking part that's been falling in for years . What good a round about when there's no road to travel on the pike .
524	We do not need a round-a-bout on the Green Bag Road. A turning lane... and a left-turning light at the intersection onto Dorsey would alleviate the traffic congestion. Why put all that money into something that is not needed and costs so much money and also takes private land?
525	YALLdon't even have a plan for drainage or re routing the creek. THE plan is design and build once it's approved. This whole project is nothing but issues and red flags all over.....
526	The proposed roundabout is a major waste of taxpayer money. Turning lanes and lights with arrows would be a simpler, more effective solution. A roundabout will change the look of the area for the worse. Leave the farmlands alone.
527	There wanting to take the old Farm!!
528	we do not need this
529	Time to vote out commissioners! They're suppose to work FOR us, not against us.
530	My name is Steve Runfola and my family, neighbors and I must use Cobun Creek Road 119/6 to access our homes. I have been reading your Greenbag Road EA.August 2020 document and I see that Aaron's Creek Road is named as a possible Detour for The GreenBag Roundabout project yet Cobun Creek Road is not named as a possible detour for the project. Cobun Creek Road is about 3 miles long and connects

	Kingwood Pike and Grafton Road. The Grafton Road/Cobun Creek intersection is about 50 yards from the Kingwood Pike bridge over I68. The Grafton Road/Cobun Creek intersection is next to Allied transfer and storage about 1 mile from Walmart. It is impossible for my neighbors, family and I to believe that Cobun Creek Road will not be used as a defacto detour during roundabout construction. People will use this road heavily no matter if it is an official detour or not. In the past we have all seen it used heavily for brief periods as a detour during road construction and automobile wrecks. My neighbors and I are very concerned that Cobun Creek road as it exists now is seriously unprepared for heavy long-term 2 way traffic that will include large trucks and other heavy vehicles. The road is one lane with no pullovers and has terrible drainage in many places. You can literally watch while moderate to heavy rains rip this road apart and turn it into a real creek or sheet of ice. Any maintenance done on the road is destroyed in a matter of weeks due to the atrocious drainage. What are the plans for this road before, during and after the Roundabout construction? We also think it's a very good idea if The County and the DOT contact us if our area is to be directly impacted by major maintenance or construction. None of us had any idea that Cobun Creek may be used as a long-term detour and so no one that I know of attended the Roundabout meetings. My name and contacts are Steve Runfola M: 1-304-680-1340 Email: StevenRunfola@Gmail.com . Thank you for your service and have a good day. Steve Runfola
531	While I applaud the DOH's work to include pedestrian infrastructure and some bike accommodations on the western half of the project, to not connect hundreds of residents and multiple businesses on the east side of Mountainview is contrary to that statement, and I hope the DOH will strongly reconsider the design from the Dorsey intersection eastward. I'd like to respectfully submit these points for consideration in the design: 1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative 5) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback as noted above. Thus, I strongly recommend (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a sidewalk or multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic (I've ridden that stretch with my 11 year old son, so we know). I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated

	from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders.
532	From the Dorsey Intersection East, there needs to be a sidewalk or multi-use path on the northside of Greenbag to accommodate all residents to safely travel to Mountainview Elementary and South Middle School. If a sidewalk had been present, my kids would have walked to and from school and never ridden a bus. As a resident, I see hundreds of families walking along Greenbag to get to work/shopping in Sabraton or the Family Dollar on Lucky Lane and it is horrifying because strollers are being pushed, toddlers and teens are walking. My husband bicycles to work and I fear for him biking on Greenbag Road as the massive amount of traffic at high speeds. The gravel trucks travel at speeds well above the speed limit and traffic consistently crosses the middle yellow line at the curve in front of our development. I support Option D at Mississippi Ave to give as many lanes as possible for this. I would not support the round about at Dorsey/Kingwood Pike. I think dedicated turn lanes is enough, as well as a turn signal in all directions to keep traffic from backing up. I appreciate the feedback opportunity and believe that the entire Greenbag Corridor should be expanded all the way to Sabraton for the safety of pedestrians and bicyclists.
533	1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane and suggest design of a multi-use path as in this location as the better alternative. 3) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback and incomprehensible in light of the state's Complete Streets Legislation. Thus, I strongly recommend a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools, LOCAL BUSINESSES, and to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project

	4) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic. A 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 5) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the planned sidewalk, which would be much more useful to all as a multi-use path, on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this entire project corridor with a 10-12' multi-use path separated from traffic on the north side of Greenbag,
534	1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist. Plus multi-use paths make much better use of limited space and serve the community best. 2) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane and strongly suggest design of a multi-use path as in this location as the better alternative. 3) From Dorsey intersection to the east, the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback and incomprehensible in light of the state's Complete Streets Legislation. This is a rare opportunity for an infrastructure investment of this magnitude and the failure to accommodate a multi-use path along the entire project corridor, even if it means narrowing automotive land widths, stands as a major misstep that could and should be corrected. As a multiple business owner and employer of 15 (including myself) situated along the project corridor at 911 Greenbag Road, I strongly recommend a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project. This would allow a much desired bicycle and pedestrian commuter corridor that has served as a blockage to my entire staff that desires this to be a safe means of travel and remove continued reliance on motorized means of transport. It's a critical path to connect the schools, LOCAL BUSINESSES, and hundreds of residents to existing infrastructure (bicycle route along Diamond Avenue with connection to the Decker's Creek Rail Trail). Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 4) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic. A simple test is whether you would you allow your own children to ride a bike on that corridor? A 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward)

	5) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the planned sidewalk, which would be much more useful to all as a multi-use path, on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this entire project corridor with a 10-12' multi-use path separated from traffic on the north side of Greenbag. We cannot miss the opportunity of this significant investment to bring a non-motorized corridor connecting all of these essential community assets.
535	Thank you for addressing the Green Bag Road in Morgantown. I strongly support the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study recommending pedestrian facilities to connect the neighborhood schools with the commercial and residential areas. Safety and access are of paramount importance. Both pedestrian infrastructure and accommodations on the western half and the Eastern half of Mountainview connect hundreds of residents and multiple businesses, I hope the DOH will strongly reconsider the design from the Dorsey intersection eastward. Further, I recommend/note: 1) a sidewalk the entire length of the project on the north side of Greenbag for pedestrians. A multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) the sidewalk on Luckey Lane extending the entire length of Luckey Lane 4) the roundabouts as designed. 5) the lack of ped/bike infrastructure on Dorsey intersection to the east is a major concern. a) I strongly recommend a 5' sidewalk on the north side of Greenbag plus paved shoulders / bike lanes on both sides, or b) a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at least a sidewalk or multiuse path from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) the bicycle accommodations (3-4' shoulders) from Dorsey intersection to the west will be very uncomfortable for the average bicycle rider (I am 78 years of age but bike all around the city and region) because of the proximity to high speed and volume of traffic. An alternative could support both pedestrians and bicycle riders, namely a 10-12' multi-use path, separated from the road 7) a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this entire project corridor, ideally with a 10-12'

	multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. I have worked on pedestrian and bicycle infrastructure since 2004. This corridor is critical.
536	I support the development of MMMPO Greenbag Road Corridor Study to enhance pedestrian, bicycle accommodations to safely connect schools with commercial and residential areas. The entire length of the Greenbag road must be included. I recommend: - a sidewalk (prefer a multi-use path) the entire length of the project on the north side of Greenbag for pedestrians. - sidewalk connecting Greenbag to Luckey Lane and Mountainview Elementary. - sidewalk extending the entire length of Luckey Lane - the roundabouts as designed. - you address the lack of ped/bike infrastructure on Dorsey intersection a) Suggest a 5' sidewalk on the north side of Greenbag plus paved shoulders / bike lanes on both sides, or b) a 10-12' multiuse path on the north side of Greenbag from Dorsey intersection to the eastern terminus of the project ----------Or, at least a sidewalk or multiuse path from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project - the bicycle accommodations (3-4' shoulders) from the Dorsey intersection to the west will be dangerous and daunting for the average bicycle rider given the high speed and volume of traffic. An alternative could support both pedestrians and bicycle riders, namely a 10-12' multi-use path, separated from the road - a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall). This will serve community members wishing to connect White Park by trail to Dorsey's Knob park & trails. All pedestrian and bicyclist travel should be supported along this entire project corridor, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. This safe and efficient corridor is critical to transportation and quality of life in the region.
537	I don't think they should put a roundabout off king wood pike fix the roads we have! Round about will just take more farm land!
538	"Overall I feel this is a poor design, and other alternatives should have been provided to the public, and for comment." - Public Comments, May 2019. I agree with previous comments made last year. Now, in 2020, the evidence presented in the Environment Assessment is not sufficient as to reinforce why hundreds of comments received asking for turning lane alternatives were not analyzed. Please describe. Thank you.

539	Additional comments encouraging productive and enjoyable harmony between human and the environment: The vast majority of design related public comments from May 2019, desired additional turning lane options at Kingwood Pike/Greenbag Rd intersection. The public sited numerous reasons why this should be analyzed further including line-of-sight design, direct and easy-to-understand traffic flow, trucking and commuter safety, considerable grade incline approaching Greenbag Rd from Kingwood Pike, trucking load shift, design-build associated risks, geographical slip topography, and lessening impacts to valued community assets (natural resources, businesses, and residences). Due to the high numbers of comments submitted last year asking for turning lane options, and the consideration that was granted by WVDOH for these options, but not the analysis, we formally and humbly request analysis of the hybrid turning lane options (further described below) that were alternatives requested last year, 2019 and demanded this year, 2020. A collection of public comments submitted April 2019 and October 2020 suggest a turning lane option at Kingwood Pike/Greenbag Rd summarized as “Hybrid Option E” or “Hybrid E." Hybrid E would combine Option D (for the Dorsey Avenue and Kingwood Pike approaches) with Option E (for the Greenbag Road approaches) addressing high level traffic concerns while, 1.) not displacing any residences or businesses or non-profits, 2.) preserving prime farmland with significant cultural and natural resource importance, including the home of Conscious Harvest Cooperative Community Garden, 501(c)3 Non-Profit; Joy And Hemp Universal LLC, WVDA Permitted Hemp Farm; the 118 year running heritage family farm - Hastings Family Farm; and Mockingbird Hill Farms agricultural production plots, 3.) Valuing geographic topography of region and lessons-learned experience with previous road projects (public comment #25 by impacted landowner), and 4.) Reducing the amount of impervious surface, causing fewer impacts to nearby streams and wetlands. This alternative suggested by the public should be considered during this point in the NEPA process to better inform the public and decision makers from here forward.
540	Substantial comments have been made advocating and acknowledging important community, cultural, and natural resources directed impacted and destroyed by the Option F. What is meaningful public involvement when information on impacts are not recorded in the potential impacts table? Why were these impacts excluded in the tables and descriptions therefore resulting poor information available to government agencies for decision-making?
541	THIS IS MY FIRST comment. The comment period is unacceptable. This meeting was poorly communicated to the greater morgantown community...a virtual meeting ? i do not consider this "meeting how does this " virual " program meet the state mandated parameters ..... for public notices and comments i.e.....as., demonstrated . .the public forum as held 16 april 2019 at a public school.

	many dont consider .your program A virual product. it wasnt really..was it. " i couldnt talk to anyone." consider watching how well Progressive Insurance.TV Commercials " are perceived.. by their own omission. now that's Virtually correct "cannnn youuuu heaarrr me. yourrrrr c brekking up.. further more...My comments from the April 16 meeting ... have not been addressed in your 1000 page report. Which appears to have little or no change from last years. submissions I spoke to state road engineer for #2 two hours last april. yet none if my concerns are mentioned.. i commented before ... and was not notified of about the virual show How we're the public to know... ? Last year there were "approx" 280 comment? What is the average # number of a responese to a state road projects ? again how th PUBLIC to know... by rhe placement of electronic road sign on 857 ...really.. that " displayed the wrong DATE !! As i speak to others..i came to realize many of my neighbor's were unaware that a public meeting was held and comment petiod is closing. my explaination is that because the state ROAD didnt.. have public meeting! How many virtual meetings has the state had before this. ? What is the criteria . is used to rate the success of said virual meeting.? numbers are available for trational state road projects.. What is the total $. monetary (dollars amount total of the green bag road project ? .. Is this indeed the largest monetary amount ever considered virtually.... as i in a "Virtual public announcements" ? perhaps you over looked.. OR thIS WAS you attempted to lower the public comments by having the program the SAME evening as FIRST PRESIDENTIAL DEBATE...
542	Please reconsider this. You are going to take away an asset to this community (conscious harvest) that could grow and benefit the people of the city for years to come. Also many people do not want these roundabouts in their neighborhoods.
543	Don't be dumb ! Nobody likes roundabouts! A waste of a good stop light! Fix the original roads and leave the garden plots alone! Please don't take away another great project for our community!

544	The roundabout option - Option F - at Greenbag Rd intersection with Kingwood Pike would negatively impact the residences on Dorsey Ave. These impacts were not considered in the Environmental Assessment. What impacts are expected as the WVDOH asserted an increase in traffic noise, associated light, and air pollution on current residences on Dorsey Ave?
545	The proposed traffic circle on Greenbag Road would be a mistake for multiple reasons. The circle would take away the "Conscious Harvest" community garden, which be detrimental to the community. In such uncertain times of Covid, joblessness, and the poor economy, people need places like community gardens more than ever. The benefits of such gardens are: Increase access to fresh foods Increase physical activity through garden maintenance activities Improve dietary habits through education Increase fruit and vegetable intake Reduce risk of obesity and obesity-related diseases Improve mental health and promote relaxation Also, concerning traffic circles in general - the traffic circle on the Mileground was done poorly. The radius of the circle is too small, and the merge lanes are too short. West Virginia's landscape does not give adequate space to construct a well designed traffic circle. (Unless, you want to tear down half a neighborhood like they did in Fairmont to get the correct proportions for one.) The Greenbag Road area does not need a traffic circle where a 4 way stop and arrows would suffice.
546	I oppose the roundabout at Greenbag Road and Kingwood Pike for many reasons. The environmental justice report minimizes the impact to our including low income families who receive resources support from the community garden. This property is an outdoor research facility for the purpose of bringing increased food security to WV. Additionally, this property is a sanctuary for many pollinators including the at risk monarch butterfly. The family that owns this property has dedicated themselves to community building in Morgantown and setting an Incredible example of sustainable practices. The solution of land owner receiving financial compensation minimized the true value and loss of this property. Money can't replace everything. Money cannot replace family heritage, community or wildlife. This project site priorities legality while minimizing the non monetary costs and convenience at the price of sustainable community development.
547	We need to pull some truckers and as many as we can and block the intersection that will bring awareness to this awful idea
548	Waste of money !! Like there is a lot of traffic there. And not to mention having no regards to what the land owners have to say. Basically stealing their land. This county is so greedy. The truck traffic will still go through town no matter what, they won't be forced to go Greenbag road. If this was any county commissioners land, I guarantee this project would not be happening.
549	Terrible idea. Making it more difficult for those of us who live in the area to get where we need to go! Hate roundabouts!
550	Every time I go near the one in the Mileground someone comes close to hitting me. I refuse to go near it anymore. I absolutely hate roundabouts!
551	, taking working farm land for this particular roundabout disturbs me. I, also, worked for 2 years in the downtown area & drive through it frequently now, and it is never really crowded. I can always find a parking place, either on the street or in a city owned garage.
552	Unbelievably foolish. 2 roundabouts there will INCREASE truck traffic downtown. If the MPO & the Commission knew the first thing about trucking they would know they set their GPS to avoid them. LMAO Large trucks need to take up two lanes to make a circle making it that much more dangerous for cars to enter.

553	I don't see how they are going to work well with large trucks that have a wider turning radius. And considering how jacked up that wannabe roundabout on the mileground turned out. I'm not sure I trust this state to get it right
554	There are two sawmills on the Kingwood Pike. There are many gravel trucks in the area that are also top heavy (in fact all semis are) They roll over in roundabouts all the time. This will be our future thanks to the CC & MPO...(good thing no one was around in this case - we won't be so lucky) Let's not forget they don't treat the roads in winter here either and the excuse is "no money"...
555	What poor planning this is...I'm certain funds are needed more in other areas. Even the roundabout that went into the new I-79 West ridge location is short-sighted, given the amount of growth and traffic that area is projected to have. Bad enough they didn't put sidewalks in that area or a traffic light by one of the busier business intersections.
556	Spend millions more on another roundabout that people will avoid and just leave the rest of the roads to turn to rubble. That makes perfect sense. LOL
557	I can just see those Greer trucks navigating that on the way to their tipple on Don Knott's Blvd. Hahahaha
558	While stealing land that belongs to someone else? Uncool. I'm disappointed.
559	They should have done the West Run bypass they discussed centuries ago. Greenbag is a bad idea. We need a better airport more than another round about.
560	Why is this happening?
561	There are a lot of residents who oppose this. Why is this even on the table. The farm is a great community resource and should be honored as such.
562	Terrible
563	This is stupid what idiot comes up with this stuff
564	What a stupid frickin idea....so glad to be the hell out of Morganhole
565	Many residents opposed this. It is a resource for many. Why did they choose this area?
566	the land still doesn't belong to the county. How can you justify stealing someone else's land?
567	you're ignoring comments about this. This is not your land to take and these people's lives matter too!
568	This land belongs to a family. Many people have offered to buy it from them for millions but they felt it was more important to keep their family farm than to sell for money. I agree with progress but not at the expense of taking others land.
569	Greenbag Rd/ Rt7 intersection in Sabraton has finally been made to be truck friendly to use when turning onto Greenbag Rd. Now the higher ups in this county/state decide to add two roundabouts which will encourage the trucks not to use Greenbag Rd even more after they are built and continue to use Rt 7/Brockway Ave. through town which is in bad shape now. Leave Greenbag Rd as is!!!!!!!!!!!!!!!!!!!!!! and add a third lane lane past Giant Eagle to turn right down Don Knotts Blvd!!!!!!!!!!!!!!!!!!mthat will help alleviate a lot of the traffic back ups and make it more truck friendly. The folks who make these decisions evidently do not drive this road several times on a daily basis and haven't a clue what is best.
570	NONE of our commissioners live around Greenbag Rd. If I was ignorant of an area I would want to hear from the residents who live nearby. They don't care and are proving it. Also, our MPO is headed by out of state, progressive traffic engineers who are more concerned about adding bike lanes than fixing the years of neglect causing our roads to collapse. Our roads are like cow paths that aren't suitable for any auto let alone bikes! You are absolutely right about Sabraton. Truckers and residents fought two roundabouts proposed there and won. WHY are we not being

	listened to? GB Rd is a continuation of the truck route they are pushing for. What makes them think truckers will use this? The residents sure don't want it. There was even an editorial in the paper this week against the roundabouts.
571	Stealing land and making an already steep hill more dangerous in the winter, let alone any other time of the year. Progress? No way. Progress, would be listening to the folks who actually live on this road and use it daily.
572	The 2 we have in Mon Co are so inadequate.
573	Getting round a bout crazy around here, this is not DC. I don't see a huge problem there, seems to flow alright most of the time, I think a couple turning lanes would handle any problems.
574	This will be an engineering feat of epic proportions. I can't even imagine how this will be accomplished.
575	you don't realize that a round a bout at this intersection is not going to keep trucks from driving through downtown. It will more than likely increase that truck traffic through town. I have heard many truck drivers say they do whatever they can to avoid driving through round a bouts
576	[the trucks] They could already use Green Bag Rd or interstate. They drive through town just because they can and do it just for spite. There would be little difference in fuel to taking alternative routes. They are simply a bunch of assholes and don't give a damn how much they destroy the streets.
577	Most people that live on and drive the Kingwood Pike are opposed to this.
578	I'm almost completely positive no trucks will travel this route. They will still go through town like they always have that won't change. And the trucks that will take the "roundabout" we hog all the lanes and just cause wrecks
579	Nobody reads the fine print or looks beyond the part they like when they vote on this type of stuff
580	No one voted for two roundabouts. It was never on a project list and you know that.
581	Did you read the MPO report I linked about the projects you keep citing? I can back up everything I say. It clearly recommends turn lanes there. (It doesn't even need those except at peak hours- there are less than 6 cars there at other times) What kind of bait and switch is going on here?
582	What is with the roundabouts? Is somebody making money off these because all the sudden they are the answer to everything. I think turning lanes would solve the problem just fine and the cost would be minimal compared to a roundabout, it would also take less of people's property. I see more damage and ill feelings with a roundabout and no positives.
583	The entire Roads to Prosperity (not progress) bond sale was a huge bait and switch. The fact is, when these politicians see money, they will find a way to get it, even if the project makes zero sense whatsoever.
584	A roundabout makes NO sense at THAT intersection. (the other one either) The residents who will be forced to drive it every day know this and hold the opinions that matter. Van Voorhis Rd is getting a big project too and I am not butting in as I don't live there.
585	There is no need for a round about at the intersection. Traffic moves quite well with things the way they are now. A roundabout is far more dangerous. There needs to be some change to the law that forbids those trucks from going through town.
586	The intersection with lights is quite safe as is. The money can be better spent on other more needed. Unless the driver is some moron there is no risk in navigating the present arrangement.
587	I avoid the roundabout! I believe the signal lights has served the purposes for years! People needs to be more patient, while they are waiting for the light to change, they can observe their surroundings! The citizens needs to help the city, county and state in stop spending money foolishly! If it's working, leave it alone! Our taxes are extremely high the way it is now!

588	NO ROUNDABOUTS. This is BS. Sad this good family is going through this. The people who travel this road and will be detoured for who knows how long over the 2 year+ construction (DOH couldn't give an actual answer at meeting) are under stress too. ☹
589	Prayers to the Hastings family that they can keep their farm!
590	Maybe they should take the roundabout out to cheat lake in front of Chestnut Ridge church, just sayin! They have sheriff's dept directing traffic.
591	No round-a-bout is needed. If the state can forcibly take this property is yours next on their list of whims??? The Sabraton intersection change was not necessary. It cut off safe convenient access to Rt. 7 from Doug Hill Rd., Woodburn, Jerome Park and Norwood, and serves no purpose. Money spent padding many pockets for the project could have resurfaced several secondary roads.
592	Right no roundabout needed wasted money
593	Farm or not, why the roundabout craze, people don't know how they work and it worsens traffic.
594	Kingwood Pike intersection SHOULD NOT CHANGE! Traffic is only backed up slightly during a 1/2 hour span. Waste 10 millions dollars for that? How much money was spent up the road a little ways past the Hasting's farm on the concrete curbs on the left? Ever since that was done water lays there and is very treacherous in the winter.... spend money to fix that!!!!!!! This is so infuriating!!! This money should be used to improve road surfaces, not creating a roundabout. Speaking of treacherous, the detour for the proposed project will detour down Aaron's Creek, really??? Take some of the money and repair this road before someone gets killed!!!! Resurface and put up guardrails where they are needed!!! Leave the intersection alone!!!!!!!!!!!!!!!!!!!!!!!!!!
595	When I called the DOH to complain about the K. Pike drainage issue, they agreed the road was fine up until the "engineers" got involved and CAUSED a drainage issue with the curbs. Unbelievable. Can you IMAGINE the future disaster they could create if citizens are dumb enough to open the door to this project? Infuriating is right
596	instead of planning the drainage and considering the danger to the wetlands BEFORE u start building you wanna design and build? thats your method? are u kidding!!!!!!!!!!!!!!! thats so half-assed and stupid youre going to make things WORSE!
597	Stupid, intersection ran smooth before lights were installed, everyone took their turn. Use the funds to fix the existing roads what a smart man would do
598	! Residents are not in favor of a 2-5 year project that adds a round about at the Greenbag Rd/Kingwood Pike/Dorsey Ave intersection. As well as one by the turn in to South/White Park. This project if chosen would take away the farm at the bottom of the hill, closes the Pike, re-routes traffic on the Aaron's creek rd. (Which is dangerous and cannot handle the amount of traffic and buses/18 wheelers that travel the Pike daily. And would impact thousands of travelers daily. The money could better be used to fix the roads in the area! The Pike itself is pothole ridden, uneven/sinking lanes and needs repaved. Please help us and spread the word! *Residents are in favor of a turning lane*
599	Turn it back into a 4 way stop and take out the stupid lights
600	Traffic moved much better with the stop signs
601	[traffic moved better with the stop signs] I agree
602	We do not need a roundabout with all the log trucks and business owners that live on the Kingwood Pike that have to move large equipment such as Pork Hilling, Nolan Dalton, Jason Nicholson, Bulldog Logging, Derek Hart and more that actually have big equipment they bring up and down the pike daily! A roundabout will not be practical for these hard working people!

603	Back in the day. When it was a 4 way stop. You didnt have backed up traffic. Now it's a freakin light and roundabouts everywhere. 4 way stops. Go back. I think the one on 705 is a freakin joke. Traffic is still.sucks. even more.
604	NO! Not when it's taking someone personal land that THEY PAY FOR
605	why do they need to take a personal farm rather than an abandoned restaurant? Makes no sense
606	If you drive through that intersection, putting in a roundabout will have lasting issues. It's not a flat area like on the Mileground or UTC
607	Love all these ppl who don't realize you can't take a large trailer through a roundabout. You know like many of the small business owners use up and down the Pike. Hauling, wood and personal use trailers as well as campers and rvs don't do roundabouts well. Plus ppl get modular homes up the Pike bc Summers schools isn't able to handle them, the roundabout would make that impossible. Sorry but there are many many down sides to a roundabout, not even mentioning the stealing of personal property for it.
608	Maybe a turning lane but ABSOLUTELY NO ROUND-A-BOUTS!!!!!! FIX THE KINGWOOD PIKE ROAD!!!!!!!
609	In regards to the detour- I drive lower Aaron's and Cobun creek almost everyday to get to the Pike or Summers School from 119 for my job. Those roads not able to handle the capacity of numerous vechicles in both directions. The roads are NOT WIDE ENOUGH. Many times I have to pull over in a ditch or back up into someone's driveway to let others pass or vice versa. Both roads are in terrible shape from pot holes to poor drainage and will only get worse with the traffic. Cobun has no intentions of being fixed until the reservoir is finished. Oh and please consider an alternative to taking that farm at the light away from those hardworking, amazing people. What a terrible position to be in right now
610	It's currently one of the safest intersections in all of the county. Hardly any accidents. Why ruin it? It's only backed up at peak hours. Same as everyplace else in town
611	All they need to do is put turning arrows with the lights that are already their. Easy fix ! Why spend millions. Then they would have money to fix the roads
612	you would need a turning lane or only have one direction moving at a time to have an arrow. Still would need to widen the roadway
613	Just add an exit on/off ramp to 68 by the Kingwood Pike overpass and it would eliminate most of the 4 way traffic. Another exit is needed here.
614	Turning lane would be awesome!!! I still think they should put in a entry to the interstate
615	I wish they would worry about the roads that are already bad instead of making other roads that people don't understand how they function.
616	Fix the dang roads and put a turning lane in that's all that is needed
617	I hate roundabouts
618	[I hate roundabouts] me too
619	[I hate roundabouts] me too
620	Fix the roads first,quit patching,
621	No fix the roads before even thinking about adding
622	They need to put a turning arrow for the pike and pave the road
623	A round about is not necessary! I know the family who owns that farm and they have every right to kee their land as it is. A turning lane would be a better alternative. And if they're gonna destroy something they could just remove the old atomic grill since nothing is going in there. DO NOT TAKE THE FARM, IT IS NOT THE DOHs RIGHT TO TAKE LAND
624	around about is not needed

625	just fix the road we don't need a roundabout
626	You could use Cobun Creek Rd to Exit 1, Lower Aarons Creek to Greenbag, or Aaron's Creek to Summers School Rd. to Exit 4. A turning lane could be ok but would also most likely shutdown the intersection and take land as well, though possibly not as much. Could always take Atomic's land and the lot across from it
627	I live and drive on Aaron's creek. No way can it take any large trucks. They wouldn't make it up the hill and over the hump at top. They would bottom out. Has happened many times. The road is not suitable for any large traffic. It is not a two lane road and the pull overs aren't big enough for large vehicles. The lights at the intersection with a turning lane should work just fine
628	can you imagine all the traffic trying to come up from Aaron's Creek onto the Pike. That would be deadly
629	Potentially a stop sign instead of a light could work, or even better, time the lights so one direction goes green but the opposite waits 10 to 15 seconds before they go green. The original direction goes red and the opposite direction stays green for another 10 to 15 seconds. Then do the same with the cross streets.
630	The farmland that would be taken as part of this project is a community treasure. The Hastings have opened their land for use by the community, many of whom would not have access to land to grow gardens and farm if not for the generosity of this family. Please reconsider either the positioning of the roundabout or the project altogether. Many families and individuals rely on this property remaining intact
631	I fully support the roundabout as it has the best solution to improve traffic flow.
632	Two traffic studies of the corridor have determined that the flow of traffic through the Greenbag Road (CR 857) corridor is controlled by the level of service (LOS) at the major intersections. The current traffic conditions and operation are considered acceptable. Potential growth in the region could negatively impact the flow of traffic. HDR Engineering, a WVDOH Contractor, has stated roundabouts with high traffic volumes become difficult. Currently, West Virginia Division of Highways (DOH) is eliminating the roundabout at the University Town Centre exit, Exit 153, that was built for $22,000,000, and less than 2 years later is being replacing with a divergent diamond interchange (DDI) for $7,000,000. The existing roundabout setup could not handle the traffic generated by the amount of development taking place. Has this recent and relevant lesson-learned been considered by WVDOH? Will the WVDOH consider the DDI design now, so can prevent a potential redesign in the near future due to potential growth and traffic increases? Roundabouts bog down when so much traffic is trying to enter the circle that cars begin to queue in the access points, often resulting in the placement of traffic lights, which defeats the original purpose.
633	Building a roundabout on Greenbag Road is not an improvement for the community. It is not only unnecessary and burdensome (no one likes roundabouts honestly), but will also be harmful towards the community. Please consider the negative impact that this will have on the Conscious Harvest program, and the countless individuals who thrive as a result of this wonderful resource, on multiple levels.

634	We need a safer way to walk and bicycle alongside Greenbag road, especially between Aaron's Creek Road / Morgantown Printing and Binding and Mountainview Elementary / Luckey Lane! The shoulders and margins of Greenbag Road receive regular daily foot traffic, including children. Not everyone has access to a car. Thank you for considering our community feedback.
635	This shall serve as a response to the proposed Greenbag Road Improvement Project located in Morgantown, Monongalia County, WV 26506.The West Virginia Department of Highways is currently proposing improvements to Greenbag Road in Morgantown, Monongalia County, West Virginia 26506. The 1.28-mile long project's roadway improvements include wider lanes and shoulders, turning lanes, drainage enhancements, and improved intersections of two roundabouts. Because this project anticipates the use of both federal and state funding, it falls under the purview of the National Historic Preservation Act (NHPA). Per the Section 106 review process,the Morgantown Historic Landmarks Commission is formally requesting an extension for the commenting period on the Greenbag Road. There is concern that both the architectural and archaeological reports completed in anticipation of the proposed project are flawed and lack the proper level of detail to adequately document the significance of the resources in the vicinity of the project area. We request time be given to conduct Shovel Pit Tests(STP) to look for any archaeological findings that could contribute to the recording and preservation of the land. An extension on the project would allow for the addition of these findings as well as an opportunity to update the HPI form on file. We look forward to consulting with your office on this project. If you have any questions, or require additional information, please feel free to contact me at 304-685-7747 or by email at shannontinnell@earthlink.net
636	Obviously these intersections need to be upgraded, so thank you for addressing them. While local drivers hate traffic circles/roundabouts, I'll leave that decision to your traffic engineers. I see roundabouts more and more in other states. People will get used to them. At least the circles proposed for Greenbag Rd. might be less susceptible to the backups seen at the 705/Mileground traffic circle. I am very happy that you acknowledge the fact that people actually walk! I absolutely support the sidewalks proposed, and think MORE sidewalks are needed: they should be on BOTH sides of the road because crossing Greenbag Road on foot is extremely difficult (constant vehicle traffic at high speeds), and many people do walk. I love that someone will be able to walk from Dorsey to Giant Eagle and Mountaineer Mall (as well as all of the other businesses along Greenbag) without walking on the (nonexistent) shoulder of Greenbag Rd. What you build now will be here for decades, so please address all aspects of transportation (car, foot, bicycle) and future growth now. Not everyone drives cars. Plus, getting people out of their cars would ease the burden on our roads. I would also like to see a bicycle lane along *all* of the new roadways. People do ride bicycles as well as walk, and Geenbag Road and Dorsey Ave are extremely dangerous for cyclists (and pedestrians). Luckey Lane is a great way to avoid the Kingwood/Dorsey intersection with Greenbag, but that road is a total mess .... very narrow, deep potholes, steep drop off on the edges, and deep ditches (I saw a pick-up truck stuck in a drainage ditch below Family Dollar). I am glad you will be addressing it. I hope you make Luckey Lane is wide enough for cars AND bicycles, as well as pedestrians. The school being located there makes it even more complicated. Big school buses sometimes use that road, and I have seen big trucks use it as well. They take up the whole width.

	Finally, I ask that you please preserve some or all of the farmland at the Kingwood Pike/Greenbag intersection. The EA said no businesses would be affected, but that farm is an active, registered business. The corner lot where Atomic Grill used to be located before they went out of business has not been active for a very long time and has been storing heavy equipment (presumably DOH's equipment?) for a long time. The house that has a small business (Premier Tax Services) is set way back off the intersection. Could you not shift the roundabout to save that farm or at least part of the farm? The current plan appears to take all of the farm while saving the crappy former Atomic Grill property and the empty lot next to the residence that also houses Premier Tax Services. Perhaps you could find a somewhat happy medium?
637	Revision of my previous comment: Due to the high numbers of comments submitted last year asking for turning lane options, and the consideration that was granted by WVDOH for these options but not the analysis, we formally and humbly request analysis of turning lane options (further described below) that were alternatives requested last year, 2019 and demanded this year, 2020. A collection of public comments submitted April 2019 suggesting interaction turning options at Dorsey Ave/Kingwood Pike can be described as two 11-foot travel lanes on Dorsey Ave and Kingwood Pike, curb and gutter, and sidewalk, as proposed in all designs. And Option D intersection designed pertaining to Greenbag Rd approaches. This can be summarized as “Option G." Proposed Revision: Please Consider "Option G" 1.) Design features relative to Greenbag Rd Approaches (Present in Option D) "Eastbound/westbound protected left turn phase” "Eastbound/westbound permissive turn phase with corresponding through traffic" These features relative to the eastbound/westbound turning phases do not displace any residences or businesses, while improving the LOS to C and E relative to the 2048 predictions, and increases the safety and access for motorized and non-motorized connections to meet the needs statement. 2.) Design features relative to Dorsey Ave and Kingwood Pike as proposed and described in Page 6 of PDF or Page iv. These features do not change between Alternatives or Options. "Dorsey Avenue (CR 81) will incorporate two 11-foot travel lanes with curb and gutter on both sides and a 5-foot concrete sidewalk.” "Kingwood Pike (CR 81) will incorporate two 11-foot travel lanes with 2-foot shoulders on both sides.” These design features relative to Northbound/Southbound approaches alone do not displace any residences or businesses, while improving the safety and access for motorized and non-motorized connections, and limiting impact to natural resources, Farmland soils of Statewide Importance, and Community Garden.

	Please consider "Option G." It creates the least amount of impact on existing businesses and residences on Dorsey Ave and the Kingwood Pike, while meeting project needs for LOS improvement, improving access for motorized and non-motorized connections,and decreasing impact on natural resources, and has the lowest estimated construction cost. Benefits of "Option G" can be summarized as: - not displacing any residences or businesses or non-profits. - preserving prime farmland with significant cultural and natural resource importance, including the home of Conscious Harvest Cooperative Community Garden, 501(c)3 Non-Profit; Joy And Hemp Universal LLC, WVDA Permitted Hemp Farm; the 118 year running hertiage family farrm - Hastings Family Farm (WV Tax Credit #); and Mockingbird Hill Farms agricultural production plots. - Valuing geographic topography of region and lessons-learned experience for previous road projects. - Reducing the amount of impervious surface, causing fewer impacts to nearby streams and wetlands. - Lowest estimated construction costs. This alternative in suggestion by the public should be considered during this point in the NEPA process to better inform the design and decision making processes from hereforward. An overwhelming number of public comments requested turning lane options at Kingwood Pike/Greenbag Rd intersection. The public sited numerous reasons why this should be analyzed further including line-of-sight, direct and easy-to-understand traffic flow, trucking vs. commuter safety, considerable grade incline approaching Greenbag Rd from Kingwood Pike, trucking load shifts, geographical slip topography, and lessening impacts to valued community assets (natural resources, businesses, and residences).
638	As a resident of Kingwood Pike, I see no reason for this project and the major disruption it would cause during construction and afterwards. It would require additional investment in other upgrades at diminishing value.
639	Safe crossing route over GreenBag road is essential. Thank you so much for continuing to build to inspire an active community.
640	Please include a HAWK pedestrian crossing in your plans for Greenbag Road in Morgantown to allow pedestrians to cross safely between White Park and the Sky Rock connector trail, per the recommendation of the Mon Valley Green Space Coalition. Thank you.
641	Please build a connector from dorseys to the rail trail to white. This is a great loop! South middle xc runs part of it but the greenbag crossing is too dangerous.
642	I would like to comment on the Green Bag Road project. I am not a proponent of traffic circles because of the one on the Mile Ground. The traffic circle is not pedestrian or bike friendly. No provisions were made for either and I would not ride my bike through there if I had to. What provisions are you making for pedestrians and cyclists? This round about is going to be in a community that students ride and walk to school. If it is as busy as the Mile Ground, something must be done to ensure the safety of the children and adults that walk or bike in that area. Speed limit 25 miles per hour, bicycles may use full lane signs, greater than 5ft. shoulders. Please make this safer than the roundabout on the Mile Ground that has no provisions at all for pedestrians or cyclists.
643	Please install a HAWK crosswalk across Don Knots blvd to allow trail users to access white park from the Rail trail access.

644	travel this road daily not nearly enough traffic to warrant a project this big. know the landowner too, how dare u take their land especially for such a joke of a project. give them what they want: a turning lane. dont need to take no houses to do that. ridiculous
645	I am in favor of the roundabout. anything to help traffic move across green bag road for the trucks and to get them off and away from downtown. I try to meet my son downtown every Friday morning for breakfast and 50% of our conversations are cut off due to the truck traffic
646	do not do this. the traffic isnt even bad there!!!!!! everyone hates this idea. dont make things worse there. if the ppl want a turn lane give them one dont take a huge chunk cuz ur greedy af
647	yall better not be taking that the Hastings are very nice people and do not deserve this. Do something in Suncrest, shit is wack there.
648	I live across town but travel here frequently. A roundabout is NOT needed. HUGE turning lanes are not needed. And whats this I hear about no plans to reroute the waterways? Deckers Creek? I work with Doctors without Borders to fix water issues and it sounds like you guys are ready to create one. Use the road you have, widen it slightly, and add a turn arrow.
649	This is a historical site.. that farm is ancient i dont care if they grow grass its not YOURS to take. what a stupid project, it would be different if the options were good but all u gave us was crap. the public deserves better we want better options!!!!!!!!!!!! or no option, no one cares if it stays the same i know all the pikers want it to stay the same. if it aint broke dont fix it HELLO
650	no roundabout. let the public vote. 4 way stop or turning lanes. stop ruining our state stahl shaffer enginerring and stupid county comission u guys dont speak for the people not even close leave us alone
651	i work with land preservation in state parks and i cant believe what is happening here. you guys want to destroy 2 acres of prime farmland soil? that should be illegal!!!! mother nature wanted me to tell you..... get a life! do some soul searching. u need serious help if you think this is okay.
652	LEAVE OUR ROAD ALONE WE LIKE IT LIKE THIS
653	Please add crosswalks on greenbag road to assist trail users in White Park to access Dorsey's Knob trail system. One location is the Mississippi St and Greenbag Road intersection. This will be a safe means to connect the parks allowing residents to enjoy the south Morgantown area more easily.
654	Green bag road needs a pedestrian crossing.
655	I would like to advocate that as part of the proposed trail loops linking White Park and Dorsey Knob that a safe, on-demand, pedestrian crossing for Greenbag Road be included as part of the road improvements.
656	Residents are not in favor of a 2-5 year project that adds a round about at the Greenbag Rd/Kingwood Pike/Dorsey Ave intersection. As well as one by the turn in to South/White Park. This project if chosen would take away the farm at the bottom of the hill, closes the Pike, re-routes traffic on the Aaron's creek rd. (Which is dangerous and cannot handle the amount of traffic and buses/18 wheelers that travel the Pike daily. And would impact thousands of travelers daily. The money could better be used to fix the roads in the area! The Pike itself is pothole ridden, uneven/sinking lanes and needs repaved. residents are in favor of a turning lane
657	I don't see how a roundabout works with the terrain at that intersection.
658	A round about is not necessary! I know the family who owns that farm and they have every right to kee their land as it is. A turning lane would be a better alternative. And if they're gonna destroy something they could just remove the old atomic grill since nothing is going in there. DO NOT TAKE THE FARM, IT IS NOT THE DOHs RIGHT TO TAKE LAND
659	How many roads could be paved and other projects completed with that money?

660	I wish the roads would just get paved again. The patch jobs they do is horrid. Down town and going over to the mall through Westover is the worst. It's patch after patch after patch. Our roads have been so neglected it's really sad.
661	downtown roads are supposed to be maintained by the money that is taken from the checks of people that work inside city limits, where is that money?
662	To the Department of Transportation, the Department of Highways, and Concerned Parties, I am writing on behalf of Conscious Harvest Cooperative, as I am on the Board of Governors. concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) Let this letter serve as Notice: Details in the Environmental Assessment (EA) about our nonprofit business, Conscious Harvest Cooperative, are not adequate and require redress. The EA states,"Impacts to the community garden have been minimized to the extent practicable." This may misrepresent the scope of the project. The area used by Conscious Harvest Cooperative is almost completely within the limits of disturbance. The value of this community, cultural, and agricultural resource would be destroyed if the project moves forward as currently designed. The design and build portions of the project around the waterways and tree-line are concerning will effect our business and may be significant. We have grievance with the fact that our entire 501(c)(3) nonprofit designation will be at risk if the proposed roundabout (Option F) is chosen. Conscious Harvest Cooperative formally request an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to address the inadequacies and omissions in the EA. The land Conscious Harvest Cooperative is located on has a soil type of Statewide Importance for Prime Farmland. It is listed within the USDA registry as Prime soil type and is of protected designations. Conscious Harvest Cooperative formally requests a Land Evaluation and Site Assessment (LESA) as protected by Federal Law. This process of LESA was not afforded to our business, this is a violation of the National Environmental Protection Act (NEPA). Let this letter serve as notice that our organization intends for remedy. Conscious Harvest Cooperative formally requests an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to to acknowledge that our business is adequately represented and the impacts to the soil, community, and business are correctly assessed, as required by State and Federal Law. The funding for our Farm to Families Program, in part, comes from renting community garden spaces, as well as, fundraised and donated monies. This cornerstone program is an income based subsidized Community Supported Agriculture (CSA) program that connects individuals and families with fresh local produce. Partner organizations join our Cooperative to access healthy food vouchers. This CSA program connects local farm and community agencies. Shareholders are then provided with CSA shares at a subsidized price. The community garden is the backbone of our outreach programs. By renting community garden spaces, we generate significant income to fund such projects. The loss of these community garden spaces would severely damage our nonprofit. In 2020 the Cooperative invested an estimated $9,555 back into the local food economy, purchased an estimated $6480 of produce for families, and provided an estimated 2000lbs. of produce to West Virginia families, these figures are annual and exponentially growing. Loss and/or damages to this program and other similar programs is significant and will require remedy and/or mitigation. The Farm to Families Program provides qualifying families access to fresh local produce. We directly procure from local farms such as Mountain Harvest Farm. The food is delivered to locations such as The Shack Neighborhood House in Osage, WV. The food is distributed to qualifying families. Without our cost-share program, these families may not otherwise have access to fresh, local produce. This is a significant

	impact to these families involved, as well as a significant impact to Mountain Harvest Farm, and our nonprofit business. It may be determined that remedy is necessary for all concerned parties and/or mitigation. Thank you
663	Now that I know it's a medicine farm, Ima try to check in and comment against another stupid circle.
664	I don't like Morgantowns new obsession with roundabouts people can't figure them out sober much less hammered. Also can one imagine coming off the pike after a snow storm and having to dukes of hazzard the median of that circle cause we can't keep the roads clear?
665	They screwed that up when they put the light in. When it was stop signs everyone took turns and never backed up like now!
666	That shows how intelligent the DOH is. Now people want the Greer trucks to run out Greenbag, you imagine the mess a roundabout would cause? They pushed for one at the other end, which all it needed was the turning lane that was finally put in.
667	They don't need a round about, all they need is a turn lane and to fix the pike.
668	No more roundabouts!! Drivers in Morgantown already dont know how to use them. We don't need more roundabouts for people to not know how to navigate. ☺☺ There are ways around this intersection for people who want to avoid traffic that don't include ruining someones farmland.
669	I can sacrifice 10 minutes of my time to save someone's land. It's only congested twice a day and on game days. I'm not sure that justifies taking someone's land. I understand eminent domain in some circumstances (like getting water to people) but this seems really unnecessary
670	How about a turning lane with a left turn signal. Should work
671	how about the 4 way stop sign again.
672	My business TONG THAI FRESH, LLC is leasing the land so that we may grow "trademark" ingredients for our signature products sold at our business. Some ingredients that we grow are: lemongrass, galanga, thai chilis, garlic, onions, and tomatoes kefir lime, string beans, etc. These ingredients are key if we are to have a niche, generate revenue and survive. Also these are ingredients my family and I are consuming in our daily lives. Growing our ingredients on the Hastings Land also saves us money on Food Cost for our business as well. Our ingredients grown on the Hastings land are also better tasting and higher quality than those found in the store or with Cisco and other food delivery service providers. These higher quality ingredients are the key to TONG THAI FRESH, LLC market functionality. These ingredients will give us an advantage in the market. My business and I are leasing a portion of that land located on the Greenbag Road four way where the roundabout may be placed. That land will generate revenue for my business. I went to the County Commission meeting at the courthouse during the open comment session and told Tom Bloom and the rest of the Commission about some of the impacts of the proposed plans that would eliminate the land I am leasing and using as a resource. Also the Greenbag Road Improvement Project will definitely affect my life, liberty, freedom, and my pursuit of happiness. Once again this "Greenbag Improvement Project" will have an enormously negative impact on my life my family's life and the life of my business and potential employees of my business. Also the Greenbag Road Improvement Project will have an impact on minorities since I will be hiring minorities.
673	this will effects my plans to sell produce, and this will effect my business because it will take most of the area i do sell produce on it, plus it take more time to finish will close my way i use daily to my house, and west a bigger piece of value farm land ,west more money that city need it in different things, most people they don't know how to use it they get confused in it ,the third line add it to the existing traffic light much easer

	to use less land to west cheaper on price ,less time to finish and every one know how to use it ,plus i am originally from the third word country my country took all round about out of service and put in the traffic light make traffic way easer to use , i do not know why city of Morgantown trying to get us back to the stone ages ,we should plan for this city for many hundred years from now not only for the moments we live ,hopping there is some one has more wisdom for future plans .
674	My comments are framed within the opportunities identified in the MMMPO's 2015 Greenbag Road Study, stating that there are nine different neighborhoods and/or community facilities within a 0.5 mile buffer of the western section of Greenbag Rd. I feel recent major road projects have not taken the opportunity to play a key role in connectivity and inclusivity of community populations to move around and enjoy local amenities on any form of transportation they may have available to them. And while this proposed plan does incorporate some improvements for these populations, it does not extend improvements to account for community connections on the east side. Please let this project be an example to the way the greater Morgantown area would like to grow its communities for the future. A future that's inclusive, multimodal, prioritize public health and belonging. I would like to see increased sidewalk lengths, wider shoulder allowances for cyclists and pedestrians at a minimum (and preferably a separate shared-use path for these users) , shared lane markings according to the MUTCD along the entire project, a maximum speed limit of 25 MPH to reduce cycling and commercial truck conflicts.
675	Additional Comment: After reviewing the EA, the report's documentation for mitigation and total impacts to the water resources are lacking. It also does not follow the 'normal' chapters that a standard stream and wetland delineation follow. This and other inconsistencies indicate other government agencies may not have been given adequate information during the NEPA analysis. Please explain. Due to these concerns and others, landowners are moving forward with an independent Stream and Wetlands Delineation Report to be submitted to the Government on or before December 2020.
676	Conscious Harvest Cooperative's garden and community programs will be destroyed by the proposed road project's design. One of Conscious Harvest's primary goals is to build our community through partnerships, workshops, and social gathering. We recognize that without community, social justice is an out of reach goal. In 2017, Conscious Harvest began to act on this mission by partnering with wonderful people doing incredible work in the Morgantown area. Milan Puskar Health Right joined our organization last spring. Below is their story. "Participants at the Friendship House, a peer support drop-in center, have wanted to garden since Milan Puskar Health Right re-started the program in 2016. Fortunately, we partnered with Conscious Harvest in 2017 and were able to tend a plot. Getting outside and growing fresh produce benefited everyone at the Friendship House. Participants at the Friendship House are adults in recovery from substance use disorder and/or with co-occurring mental health diagnosis. Peer support is a way of providing help based on "lived experience." That is, our staff of Peer Support Specialists has personally experienced substance abuse disorders and mental health concerns. They use their experiences to work with people through the struggles and success of living in recovery. Our plot with Conscious Harvest provided a place for over 30 participants to be productive citizens and learn new, valuable skills. We were able to start seeds at the Friendship House and prepare the plot, transplant seedlings, harvest vegetables, and have picnics at the garden. We harvested tomatoes, onions, potatoes, lettuce, radishes, peas, and even a few gourds that all went to feeding low-income individuals in our community. Next year we look forward to expanding our efforts and collaboration!"

	You can learn more about Health Right and the Friendship House at mphealthright.org https://www.consciousharvest.org/latest-news
677	This is my second comment. The property at the corner of the Kingwood Pike and Greenbag Road that I own has a market value of millions of dollars.
678	Details in the Environmental Assessment (EA) about our nonprofit business, Conscious Harvest Cooperative, are not adequate and require redress. The EA states,"Impacts to the community garden have been minimized to the extent practicable." This may misrepresent the scope of the project. The area used by Conscious Harvest Cooperative is almost completely within the limits of disturbance. The value of this community, cultural, and agricultural resource would be destroyed if the project moves forward as currently designed. The design and build portions of the project around the waterways and tree-line are concerning will effect our business and may be significant. We have grievance with the fact that our entire 501(c)(3) nonprofit designation will be at risk if the proposed roundabout (Option F) is chosen. Conscious Harvest Cooperative formally request an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to address the inadequacies and omissions in the EA. The land Conscious Harvest Cooperative is located on has a soil type of Statewide Importance for Prime Farmland. It is listed within the USDA registry as Prime soil type and is of protected designations. Conscious Harvest Cooperative formally requests a Land Evaluation and Site Assessment (LESA) as protected by Federal Law. This process of LESA was not afforded to our business, this is a violation of the National Environmental Protection Act (NEPA). Let this letter serve as notice that our organization intends for remedy. Conscious Harvest Cooperative formally requests an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to to acknowledge that our business is adequately represented and the impacts to the soil, community, and business are correctly assessed, as required by State and Federal Law. The funding for our Farm to Families Program, in part, comes from renting community garden spaces, as well as, fundraised and donated monies. This cornerstone program is an income based subsidized Community Supported Agriculture (CSA) program that connects individuals and families with fresh local produce. Partner organizations join our Cooperative to access healthy food vouchers. This CSA program connects local farm and community agencies. Shareholders are then provided with CSA shares at a subsidized price. The community garden is the backbone of our outreach programs. By renting community garden spaces, we generate significant income to fund such projects. The loss of these community garden spaces would severely damage our nonprofit. In 2020 the Cooperative invested an estimated $9,555 back into the local food economy, purchased an estimated $6480 of produce for families, and provided an estimated 2000lbs. of produce to West Virginia families, these figures are annual and exponentially growing. Loss and/or damages to this program and other similar programs is significant and will require remedy and/or mitigation. The Farm to Families Program provides qualifying families access to fresh local produce. We directly procure from local farms such as

	Mountain Harvest Farm. The food is delivered to locations such as The Shack Neighborhood House in Osage, WV. The food is distributed to qualifying families. Without our cost-share program, these families may not otherwise have access to fresh, local produce. This is a significant impact to these families involved, as well as a significant impact to Mountain Harvest Farm, and our nonprofit business. It may be determined that remedy is necessary for all concerned parties and/or mitigation. (Continued)
679	We need safe sidewalks/pathways from Dorsey East to the end of the project. It would also be nice to incorporate bike lanes in both directions. If Morgantown wants to continue and/or enhance its status as a bike-friendly city, we should be able to bike safely into and out of the city for a reasonable distance.
680	Continued from #678 Nonprofits would be affected as well, such as the Friendship House. The Friendship House rents a garden plot for their program that allows for a space for recovering addicts to go into nature with members of a treatment group to find relief. This program was featured on ABC News Pittsburgh. The loss of these types of programs would be significant to the recovery community, the Friendship House, and Conscious Harvest Cooperative and would need to be redressed and/or mitigated. Local businesses would be affected such as Mountain State Brewing Co., this business relies on our organization to dispose of wood ash from their wood fired ovens. This ash is not accepted as municipal waste and is not allowed to be dumped at their location by the river as noted by the Monongalia County Health Department. Our organization saves this business time and money by remediating this waste into a usable agricultural amendment product. Loss to businesses like Mountain State Brewing Co. and Conscious Harvest Cooperative would be significant and remedy required and/or mitigated. Fundraising is a large part of our nonprofit business. Though the garden itself is within a portion of the land for our farming and gardening activities, the land as a whole serves as an area for fundraising. Access to this land for music venues, cookouts, and other events is significant and loss of such land access would impact Conscious Harvest and damages may need to be awarded for such disturbances to our business. Conscious Harvest has significantly improved the land in whole, and has used donated monies and earned monies for the gravel in the parking lot. Volunteer labor has maintained the driveway entrance and road access. These donated and earned monies and donated labor will need to be assessed, reimbursed, and remedied while considering the donated labor of the trucking company who delivered the gravel including: fuel usage, wear and tear of equipment, and time to spread the gravel and/or mitigation. Perennial plants bought from monies donated and earned as part of a beautification project are significant and would need to be reimbursed and/or mitigated. These plants include, but are not limited to: beautiful, hearty fig trees that require years of growth before fruiting. The fence around the garden was built with donated and earned money and will lose integrity if moved. This fence would require a substantial amount of labor and possibly large equipment/trucks to move properly. The labor and equipment rental must be remedied and our business reimbursed for damages incurred and/or mitigation.

	Moving the fence will require storage for an amount of time to be designated as we look for another location. Storage fees for the fence will need to be established and the finances reimbursed and/or mitigated to the maximum extent of the law. Reconstruction of the fence will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. The pole barn located along the tree-line was built with a substantial amount of donated and earned monies and volunteer labor. Loss to this structure will be devastating as it will not be able to be moved. This structure is important to our business because it allows for shelter of our clients during inclement weather and also serves purpose during fundraising events. Mitigation and/or reimbursement of monies and labor must be remedied. Reconstruction of the pole barn will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. (Continued)
681	Continued from #680 The tool shed along the tree-line contains donated and purchased tools. Loss of the shed will be significant. The tool shed was built with volunteer time as well as with donated and earned monies for materials. There is an appreciable mural painted on the shed by volunteers and local artists with paint procured by our nonprofit, damages will be significant and mitigation and/or reimbursement will be necessary. Reconstruction of the tool shed will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. A temporary storage space, in place of the tool shed, for all the tools will be needed. Tools will require storage for an amount of time to be designated as we look for another location. Storage fees for the tools and maintenance of the tools in storage will need to be established and the finances reimbursed and/or mitigated to the maximum extent of the law. The tilling and maintaining of the individual garden beds is significant. Some members have worked their individual plots for years, even before the 501(c)(3) destination was awarded. The fact that they can continually garden in the same location is important to the integrity of the crop, the soil, and our project. Mitigation and/or reimbursement may be necessary as remedy for the hours of labor and materials put into these garden beds. Creation of new garden beds will be labor intensive and also will require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation.

	The ability for our clients to have access to soil of this type, to grow food varieties of their choice, with whatever techniques they choose is significant. The service we provide gives our clients access to local food and creates sustainable food security. This is very important, especially during a pandemic, COVID regulations, restricted store hours, and limited food product availability. The loss to each individual member of our garden may be significant and require remedy to their persons and/or mitigation. Reacquiring land of this soil type, with access to parking, room for a pole ban and tool shed, with consideration to proximity of a metropolitan area, would be burdensome and challenging. The damages to our nonprofit would be significant if this project continues as planned. Access to this land may be irreplaceable. Mitigation and/or remedy may be necessary. Let it be known that standing EA has not allowed for adequate time to assess the full impact to Conscious Harvest Cooperative 501(c)(3). The standing EA appears to have inadequacies and omissions pertaining to the soil type at our location. Exact amounts and values for remedy are to be determined, the burden is ongoing. The design and build phase is concerning; and, additional damages incurred to our business may be assessed and reassessed in the future as we continue to identify more damages, as the damages are ongoing.
682	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a concerned party regarding land (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10) as I am an owner. The proposed project would effect my person. My land is within the boundaries of disturbance for Option F as described by the Environmental Assessment (EA). I reserves the right to seek damages and/or remedy if this project continues as planned with Option F listen as the “preferred” alternative.
683	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a Concerned Party regarding this project, as I anticipate inheriting the land in question (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10) from my father Dewey Hastings This project would affect my person as the land in question is within the boundaries of disturbance of Option F. I reserve the right to damages and remedy if this project continues as planned with Option F listed as “preferred” alternative.
684	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT)

	I am a Concerned Party regarding this project, as I anticipate inheriting the land in question (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10) from my father Dewey Hastings This Project would effect my person as the land in question is within the boundaries of disturbance for Option F as described by the Environmental Assessment (EA). Notice: The proposed project has NOT afforded Dewey Hastings participation in the 106 Review process and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). Dewey Hastings does in fact do own land in a location of contribution to a qualifying historic site "The Dorsey Plantation" more commonly known as "The Dorsey Farm". Notice: The proposed project has NOT afforded Dewey Hastings to participation in the 106 Review Process and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). Dewey hastings does in fact own land in a location that is significant to material culture of history and pre-history. Notice: The proposed project has NOT afforded Dewey Hastings participation in Land Evaluation and Site Assessment (LESA) and maybe in violation of Federal Law under the National Environmental Protection Act. Dewey Hastings does in fact do business in a location of "Prime Farmland" and has soil of "Statewide Significance" Notice: I, Ted Hastings, heir to Dewey Hastings, reserve the right to seek damages and/or remedy if this project continues while denying Dewey Hastings rights as afforded by NEPA.
685	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a concerned party regarding land (Map 48, Parcel 10 & 11, and Map 10, Parcel 54.10), as I am an owner. This Project would effect my person as a portion of the land in question is within the boundaries of disturbance for Option F, as described by the Environmental Assessment (EA). Notice: The proposed project has NOT afforded my person participation in a 106 Review and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). I in fact do own land in a location of contribution to a qualifying historic site "The Dorsey Plantation" more commonly known as "The Dorsey Farm".

	Notice: The proposed project has NOT afforded my person to participation in 106 Review and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). I in fact do own land that is significant to material culture of history and pre-history. Notice: The proposed project has NOT afforded my person participation in Land Evaluation and Site Assessment (LESA) and maybe in violation of Federal Law under the National Environmental Protection Act. I do in fact own land in a location designated “Prime Farmland” with soil of “Statewide Significance” Notice: I reserve the right to seek damages and/or remedy if this project continues while denying me rights as described by NEPA.
686	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a concerned party regarding Joy and Hemp Universal, LLC as I am an owner. This Project would effect my business. Joy and Hemp Universal, LLC is within the boundaries of disturbance for Option F as described by the Environmental Assessment (EA). Notice: The proposed project has NOT afforded my business participation in the 106 Review Process and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). Joy and Hemp Universal LLC does in fact do business in a location of contribution to a qualifying historic site “The Dorsey Plantation” more commonly known as “The Dorsey Farm”. Notice: The proposed project has NOT afforded my business to participation in the 106 Review Process and maybe in violation of Federal Law under the National Environmental Protection Act (NEPA). I in fact do business in a location that is significant to material culture of history and pre-history. Notice: The proposed project has NOT afforded my business participation in a Land Evaluation and Site Assessment (LESA) and maybe in violation of Federal Law under the National Environmental Protection Act. Joy and Hemp Universal, LLC does in fact do business in a location of “Prime Farmland” with soil of “Statewide Significance” Notice:

	Joy and Hemp Universal, LLC reserves the right to seek damages and/or remedy if this project continues while denying Joy and Hemp Universal, LLC rights as described by NEPA.
687	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a concerned party regarding Joy and Hemp Universal, LLC as I am an owner. The proposed project would effect my business. Joy and Hemp Universal, LLC is within the boundaries of disturbance for Option F as described by the Environmental Assessment (EA). Joy and Hemp Universal, LLC reserves the right to seek damages and/or remedy if this project continues as planned with Option F listen as the "preferred" alternative.
688	We do not need nor want this roundabout! It's just plain crazy to put a roundabout at the end of the pike with all the log trucks, dump trucks and more large vehicles that have travel the Kingwood Pike daily! We want/need either a turning lane or simply put it back to 4 way stop as it was before. It's a waste of money! Money that should be used to fix the roads we already have!
689	I am completely against this, Aarons Creek cannot handle the traffic this would cause, the road is in poor condition as it is and is very narrow in places. It would be very dangerous, especially to the children in this community, the damage this would cause could be irreparable. The road cannot handle the large trucks, especially if two needed to pass each other. This would cause alot more issues then leaving Greenbag Rd, as it is. It's absolutely absurd to reroute traffic down Aarons Creek.
690	There must be a thorough detail analysis of all reasoning. Too much of nature is taken with little remorse. Also the traffic issue IV been going through the 4 way for many years and never had problem when light was installed. Leave it be
691	The roundabout at Greenbag/Kingwood Pike would be dangerous for the construction period. There is no good alternate route for traffic to come into Morgantown from the Pike especially between route 7 and the bottom of the Pike.
692	I think there are other places that they can use that money. I agree that if traffic is a problem then put in turning lanes
693	I work in Morgantown and travel between there and my home in Kingwood. There is no need for a roundabout at the intersection of Green Bag Rd and the Pike. A turning lane would solve the issue. The roundabout on the Mileground still backs up traffic. People don't use it properly. We don't need one at this intersection. The money would be better spent to maintain the roads we do have. This is not only a costly project, but the time it would take to complete would have a major strain on the surrounding areas. Diverting down Aaron's Creek is not suitable for large trucks. Not to mention, the road is not suitable for that amount of traffic. It took how long to fix the cave in less than a mile above that intersection?!? This will literally drag on for years! The citizens have expressed

	their feelings towards this project time and time again. Yet, you ignore the wants of the public. Shame on you for leaving our roads to crumble just to pat yourselves on the back for putting in a roundabout. Please let those of us who actually drive that road everyday have a say in this. Sincerely, A Disgruntled Citizen
694	I've never understood why such a high-impact solution was favored here or why this was a priority ahead of many, many other issues. I think roundabouts are practical and I'm looking forward to the other instances in Morgantown being brought to their full intended use, but this intersection has always only needed a turning lane and Mississippi Street probably doesn't need anything.
695	I fully support the installation of a roundabout at the intersection of greenbag rd and the kingwood pike. This would provide traffic improvements to support growth in the area and improve the quality of life while living near the intersection. This would also reduce the likelihood of accidents and the severity of any accidents that would occur thus providing for the protection of life in our community. Additional improvements of sidewalks along the road would also improve the community and provide access to safe and healthy alternative transportation in the community and allow for a more connected community for those unable to drive. The elimination of idling vehicles at the stop light would reduce air pollution in the nearby homes and on the school playground. And the the reduction in traffic related stress and commute times for those traveling the roadway could improve community morale. Morgantown desperately needs traffic plans that reduce congestion and encourage connected communities as we grow.
696	I am opposed to the roundabout on Rt857, Morgantown WV, there are no issues from Dorsey or the Kingwood Pike I drive it 5 days a week. Just stagger the lights on Greenbag Road/857 so that people can turn to Dorsey or the Kingwood Pike freely and the traffic will move. No one will mind a longer light, the beautiful setting will remain and the money can be allocated for road repairs, which is a much needed expense. I hope you reconsider; the small farm at the intersection of 857 and the Pike is a wonderful green space in a world where they are shrinking every day. Young folks put gardens in and grow beautiful flowers along the road, it is quite charming and I am sure I am not the only person that enjoys watching the gardens and flowers after a long day of work as summer comes. Choose the farm over the concrete, please. Thanks for listening Barb
697	Don't want a round about on greenbag road
698	I am AGAINST a roundabout on Greenbag Rd and the Kingwood Pike. The traffic pattern could be solved with a simple turn lane. The roundabout on the Mileground has done NOTHING to improve the flow of traffic- neither would one on Greenbag and Kingwood Pike!
699	I live in a housing development along Greenbag Road. I travel Greenbag Road and Dorsey Avenue nearly every day to go to work and back. I am against a roundabout. Adding a turn lane would be more effective and likely, less expensive. Traffic rarely backs up except for peak times in the late afternoon. Even then, delays only average a few minutes. Roundabouts do not work in this area. If you need proof, check out the roundabout on the Mileground between 4 and 6 pm during the week. People do not yield. Cars block the lanes and back-up traffic. Someone needs to actually observe the traffic flow at the site of the planned roundabout. They would clearly see that a roundabout is not needed.
700	I do not support the proposed updates to Greenbag road. I understand the need for changes due to traffic problems at this intersection, but I believe creating turn lanes on Greenbag road would be an equally viable solution that would likely be cheaper and less time consuming.

701	The roundabout is completely unnecessary at the end of Kingwood Pike and Greenbag road. Turn lanes would be more than enough to help the flow of traffic. There is never much wait time at that intersection at all. My family uses that intersection several times a day and have never had any issues. The money for the roundabout would be better spent on turn lanes and fixing all the potholes properly on Kingwood Pike.
702	need safe sidewalks/pathway from Dorsey East to the end of the project
703	No, no, NO roundabout. Please please just put in turn lanes. It only backs up during certain times of day and only for a short amount of time... I understand that in this "Amazon prime" day and age of instant gratification and extreme lack of patience, it can be frustrating but it truly isnt a problem all the time. It wont hurt any of us to have a moment to pause, give us a chance to think, decompress after work, or slow down and catch up on a podcast or audio book. Please please consider turn lanes.
704	Please do not put in a roundabout in at the intersection of Kingwood Pike and Dorsey Ave, it is absolutely not needed. Listen to everyone who is commenting on this. All that is needed are a couple turning lanes. The road that those of us who travel Kingwood Pike daily because we live there are going to be expected to use a road that is NOT suitable for heavy traffic that the Pike handles daily. This does not even include tractor trailers that also travel the road daily. This is going to be extremely dangerous for everyone.
705	it is absolutely ridiculous to waste all that money and destroy land to remedy a few hours of traffic per day.
706	No round about!!!!!!!
707	Please rethink this! A roundabout it not necessary in that area. I have lived near (within a block) of this area my entire life. Please do not destroy the farmland in this area. We do not have much left as it is in town.
708	This area does not have enough continuous traffic to have an absolute need for a roundabout. Then, the idea of detouring everyone to a Aaron's Creek Road, a road that is in no condition to handle any more traffic because it would worsen the current conditions for those that live there and it is a single lane road in some spots. This money could be used to improve the current roads we have and go a long way in benefiting the community. Also, taking farming land from long term residents that feeds said community is government power at its absolute worse.
709	No roundabout!!
710	I am against the roundabout. There is no good detour that would make sense to use for years.
711	Please consider a turning lane. We have a large camper, my husband hauls a large trailer. I have lived on the Pike for 10 years and have never had an issue at the bottom. There is no need to spend all this money on a round about that is not needed!!! Plus, 2-5 years of the Pike being closed at the bottom?!?!?! That is insanity. None of the routes for detours are acceptable for the heavy amount of traffic that will be using it. No to the roundabout!!!
712	The roundabout will not work. Just add a turning lanes or change light to a four way stop. The detours are just a joke. You can't even pass on Aaron's creek. There is no way a bus can do it.
713	I travel the Aaron's Creek Rd frequently to visit my mom and this road is not an adequate option to reroute traffic for 2-5 years during the construction of the roundabout. I feel adding a turm lane on the Greenbag Rd would relieve the traffic issues and save a lot of money and time on this project. Please reconsider the roundabout option in favor of turn lanes.
714	I am NOT IN FAVOR of building a round about at the Kingwood Pike/Dorsey Ave intersection. The Kingwood Pike needs fixed and so does Aaron's Creak Road. How about putting the money, where people who live and use the roads everyday say it needs to go, instead of insisting on something that will make the problem worse.

715	I am submitting comments on the proposed Greenbag Road Improvement Project. The project should not more forward until the proper Environmental Assessment has been revised to consider the following recommendations for impacts. · Correct errors regarding the classification of land use and designation for the Hastings property, including updating all maps and tables that reference prime farmland (farmland of statewide importance), analyzing and identifying the socio-economic effect from the loss of farming income, and identifying the mitigation for both the loss of the prime farmland (farmland of statewide importance) and the loss of income. · Provide information on the post-construction conditions of streams in the project area to accurately quantify steam impacts and stream mitigation requirements. · Quantify and mitigate for impacts from increased stormwater discharge to Aarons Creek and Cobun Creek, which will be impacted even though they are outside the area of disturbance. · Revise the wetland delineation report to accurately describe soil types and expand field surveys to ensure that all wetland (hydric) soils are reviewed in the EA. · Quantify the impacts on wetlands adjacent to the project's limits of disturbance from changes to wetland hydrologic conditions, increased deposition of sediment and pollution, and resulting stress on existing vegetation. · Include and analyze a new option with dedicated left turn lanes for the Greenbag Road approaches and design features, but no added lanes, for Dorsey Avenue and Kingwood Pike. While improving Greenbag Road is an important step for the growing urban area of Morgantown, this project fails to capture the dovetailing of growth and meaningful design with watersheds and farmland. If anything this road project should help facilitate the businesses and farms that comprise this intersection, while minimizing environmental impact. Once we lose these prime farmlands and co-operative spaces, that are an important fabric of our society, they are impossible to replace. Thank you for your time and effort,
716	Please reconsider your plans regarding the Greenbag Rd/Kingwood Pike intersection. The terrain is not conducive to a roundabout. In order to even try to ensure adequate lines of sight and traffic safety, land on one side of the road would require extensive excavation, while the other side would have to be built up. Taking into account the significant amount of heavy truck traffic that is anticipated with current plans to reroute loaded trucks to that roadway, especially when many of these trucks are known to not adhere to weight and speed regulations, creating a roundabout there would be especially dangerous for motorists and pedestrians. Furthermore, when you use eminent domain to acquire the property for such a poorly thought out plan, it is a slap in the face to the property owners, and the entire community.

	I agree that the intersection has issues that need to be addressed. However, it would be much more efficient traffic-wise, less invasive to the landscape, and likely more cost effective to add a turning lane, rather than an ineffective and dangerous traffic circle. For the safety of our community, please reconsider and do not build a roundabout at the intersection of Greenbag Rd and Kingwood Pike.
717	i really angst the round about it is very confusing for me in the traffic ,plus it take a lot of property a way from people and that mean a big spend for our tax money in nothing and it could be fix the problem with easy way by 3rd line adding to the traffic light same as the traffic in Paterson Dr with university Ave ,it is very simple and more modern
718	As a resident of Morgantown and Aarons Creek Road I would ask that the reroute for the roundabout project onto Aarons Creek Road be reconsidered. Aarons Creek Road is not a two lane road and is busy enough as it is. In the event that you meet another car there are not adequate places to pull over to allow another traveler to pass by. The ditches are too deep to pull to the side of the road, even in a 4WD vehicle; therefore the places travelers would be able to pull over are the residents private driveways. This is inappropriate use in my opinion. The road is curvy and travelers already speed. A portion of Upper Aarons Creek and Lower Aarons Creek were paved less than a year ago and already in terrible shape. If the traffic increases on Aarons Creek Road I fear that the conditions of the road will diminish drastically. I am fearful for the safety of myself, my child, my pets and my neighbors with increased traffic on this road. Please do not punish the residents of Aarons Creek Road.
719	Please do not put a round about at the end of the kingwood pike. I do not mean this out of disrespect but I could care less about the farm property, yes its crappy you are trying to take it, but I am more concerned about the well being of my family if a round about is placed at the bottom of the kingwood pike. This is a community full of older generation people that refuse to go to the mileground because they do not know how to drive on a round about and if they do they get hurt from accidents because they are uneducated. I really am concerned for my community and its population. I say no to the round about.
720	I am currently 2 years into a 5 year property lease at the historical Dorsey Farm on the corner of the Kingwood Pike and Greenbag road, in Monongalia County, West Virginia. I would like to make my concerns clear as to how this construction project will impact my business in the state of WV, as well as my personal livelihood and health. I am currently an active Emotional Therapist with a focus on holistic well being. After 10 years of research and experience, I have decided to start my business at the Dorsey Farm which is owned and operated by the Hastings family. I chose this farm because of several imperative requirements which I will summarize below; 1. Clean, running, natural spring water with a pH of 7.0 or above. 2. A minimum of 7 acres of natural, undeveloped farmland that is privately owned and not visible from any road. 3. Access to an active, legal, licensed Cannabis or Hemp Flower farm that uses no pesticides or man made chemicals throughout their process. 4. Access to organically grown produce using a permaculture style process to maximize consumable food that is grown together with Cannabis or Hemp Flower. (Enough to provide for myself and my family throughout the winter) 5. Proximity equal to or less than 20 minutes travel time to my only Grandparent, to whom I am the primary care giver. 6. Parking and facilities for myself and my Emotional Therapy clients. 7. Low light and low noise pollution.

	8. Clean, dry, covered and enclosed workspace to be a minimum of 20' x 40'. 9. Secure storage area for equipment, tools, and supplies. 10. Access to hardwood timber for harvesting. 11. Renewable energy. (Currently using solar power) 12. The ability to directly contribute to my community, my state, and my country via community education as well as organic produce distribution. (Currently involved with 45 different sites at the Dorsey Farm) 13. Isolated acid mine drainage site. 14. Raised deck at a minimum of 24' x 24' to accommodate a Sioux, Native American Tipi. If this plan is to be executed, especially with no negotiations with the Dorsey Farm owners, I will be forced to break my lease, made to be jobless and homeless, and will be left to mitigate these damages that will surely put myself and my family living on the streets as well as negatively impact, or potentially reverse the progress of my business and my clients. This action would force me to start my business over while being homeless. In the midst of a pandemic, it's difficult to see how I would be able to survive. It was very difficult and research intensive to gain access to this historical and unique farmland. If my lease is to be broken; 1. Where will I go that would meet these requirements? 2. How will I afford to sign a new lease, deconstruct, pack, clean, move all materials (requiring a truck bed of a minimum of 24' in length), and rebuild in a new location? 3. What will I do with my brand new business that is just getting launched? 4. Where will my clients go for Therapy? 5. How will I get access to food and medicine that is organically and sustainably grown in a permaculture style environment? 6. Where will my clients, family, and I get access to farmland with this type of historical significance, religious freedom, and community involvement? 7. How will I continue to care for my Grandmother? My family? Myself?
721	I think a traffic circle would work great on Greenbag road and Kingwood Pike intersection. However, it would be much more advantageous to travelers on the Kingwood Pike and from Preston County if you would spend this money on an on/off ramp for I68 at the Kingwood Pike bridge. It would eliminate 90% of the traffic at that intersection.
722	Please add true side paths along Greenbag road so bicycles and walkers can move through the area. Narrow shoulders and side walks are good but not enough. Also slow the speed another 5 or 10 miles per hour for safety. Turn lanes are preferable to roundabouts, they take up less space and work better with drops in elevation. Please connect the sidewalks all the way up Dorsey for school and walker safety. People live here in several neighborhoods and commuting routes, we need both efficiency and safety for all users. Please add true side paths along Greenbag road. Lower speeds 5-10 miles per hour. Turn lanes are preferable to roundabouts. Add sidewalks all the way up Dorsey for school and neighborhood use. People live here. I Vegetable garden in this area in the community garden so am frequently here.
723	Several of us are totally against the roundabout on Greenbag Rd. Its not warranted. If you add turn lanes to Greenbag Rd that would alleviate the traffic issues and create better flow.

724	I have been a resident of Morgantown basically my whole life. I strongly disagree with the planned roundabout at the intersection of Greenbag Road and Kingwood Pike. Though the intersection needs fixed to keep/maintain the flow of traffic, the roundabout is not the best option. The preferred option from the residents of Morgantown would be to add a turn lane as proposed as an alternate option. Based on the information given during the public meeting it appears that all factors were not considered in the evaluation and decision to turn the intersection into a roundabout. There will be a significant amount of time that the residents and those from surrounding counties will be unable to use this route. The proposed detours have not been considered/evaluated for the additional maintenance and cost associated with it to make these detours efficient enough. The detours will also cause traffic issues in other areas due to the huge increase in traffic flow. Though it was stated that the roundabout is the safer option, many would disagree from personal experience of the other 2 roundabouts we have in Morgantown. Another issue is trucking, which is a very common profession in this area, and a roundabout would cause issues for many people that are just trying to make a living. The Hastings farm land and all the people who benefit from the use of it would be directly impacted by the roundabout as well. Farm land is irreplaceable and should not be taken for such a project when there are other options available. In all, the people of this community that use and will be directly effected by this change, strongly disagree with having a roundabout built and prefer to have the turn lane option constructed instead.
725	A roundabout in this area makes no sense. This will only divert traffic to aarons creek road which is in terrible shape as it is. A simple turning lane would do wonders in this area or diverting traffic past the park and around Marjory Gardens the school bus route from south jr high school. Stop cutting corners with dangerous roundabouts. Widen the school bus route and place a light there where it connects in front of the grave yard. Why destroy what little farm land we have in monongalia county.
726	Build the roundabout. Traffic congestion there is horrible, especially if you're trying to turn left at the light. It is definitely a safety issue. I have lived in Morgantown for 40 plus years and have not observed any use of that "farm" until just recently.
727	Why take farmland that has been around for several years and waste 10 million dollars. When a turn lane and or arrow light would be much cheaper. An rerouting traffic on Aarons creek. What a joke.
728	I dont think we need to put around about on greenbag Rd 1st am a tax payer you should be fixing the roads like brockway ave where you let these big trucks destroy our roads and stop patching pot holes fix those roads. On the corner of greenbag road Hastings farm do alot to help the community. I say no to the roundabout.
729	Rerouting that amount of traffic into Aaron's Creek Road will be a terrible safety hazard for an already eroding, unstable and narrow road. This round about project is a very bad idea. Find another solution! No rerouting traffic into Aaron's Creek
730	Please no round about.
731	I am very concerned about the use of a roundabout at the intersection of Greenbag Road and the Kingwood Pike/Dorsey. One of the goals of the Greenbag project was to encourage traffic to divert out of downtown to a broader, safer road. The weight and speed of the trucks that will be speeding down this road as well as their size, makes it likely that the roundabout will simply be avoided for a more straightforward approach. I do not understand how a roundabout will serve the purpose of increasing overall safety. Second, this intersection is at a local school and I do not believe the roundabout is being designed to protect pedestrians who already face peril on Dorsey and Greenbag, where neither has sidewalks. I and many others want this project to successfully manage the traffic in our area to protect pedestrians and protect local streets and roads while facilitating safer transport of overweight loads. Please consider addressing the safety and transport needs of our community by widening the road, slowing down traffic and adding turn lanes. We know that our goals and aspirations for this space are the same. Thank you

	for all you do and best wishes. Rachel Fetty
732	No round about
733	About three years ago I met the Hastings and at this point I knew nothing about nature, growing, farming, working hard, dedication and really understanding the agriculture aspect for now and our future. I've also grown and many other aspects of my life and tremendously I'm doing fairly well myself now. I live on this little farm in a tent and every night it's quite peaceful out here growing and becoming one with nature. I also know I walk to work on a daily basis and believe me it almost seems like these drivers are more in a rush and let's not forget to mention there's a school right here and no one bothered to think about putting sidewalks then for the Bluegrass and Marjorie Gardens community. There's definitely a more resourceful and most efficient way of handling this situation. So because I live in a tent on the field where the roundabout would supposably go, this will majorly cause a significant impact not only in my future and spiritual growth process but also furthering mine and everyone else's education towards agriculture and the potential to bring the community together as a whole which the world desperately needs right now. I would not have access to another place without a lot of work to move clear and level out another location and the damages should potentially be awarded if decided by a judge of court. Sad to watch people driving their cars heading nowhere fast not even realizing life and the bigger spectrum of things. I'm fully aware of the non existing sidewalks that should have been constructed a long time ago. At this point it's not the matter of right and wrong but simply looking at it for what it is. Truthfully we think we know what's best for everyone but in all reality this is a learning process for everyone to learn and grow and experience something greater than our perception of how we view the world today. Just know Mother Nature is within all of us and maybe it's time to take two steps back and ask yourself what would Mother Nature and our ancestors want. I humbly ask to reconsider and try reaching out to the community on a spectrum where something magnificent can it be done instead of us trying to throw money at a situation that we know it's not going to work for anyone in the long run. We should definitely look towards other options as well as cross-guards during and after school hours and of course turning Lanes. Yes: Turning Lanes, Sidewalks, and school crossing guard. Crossing Guards helps pedestrians and bikers cross the street safely. ... A crossing guard is the role model of crossing safety, teaching school kids and others how to safely cross the intersection. One of the important tasks of the crossing guard is to assist in risk management by alerting authorities of safety hazards. Turn lanes are traffic lanes that allow you to make a right or left turn at an intersection or to a side-road. Turn lanes are controlled by road signs

	and pavement markings that show you the direction of travel from the lane. Regulatory road signs that control separate lanes are known and lane-use control signs. No: Roundabout on greenbag road and Kingwood pike
734	Horrible idea. Especially rerouting traffic through Aaron's creek. Have you all not traveled Aaron's creek? Not a good idea by far.
735	Not in favor of roundabout at all!! NO! NO! Do NOT let Aarons Creek Rd be route for Greenbag Rd intersection roundabout project!!! It is a ONE lane road!!! HAS ANYONE in charge of this project driven this road? If so, I would hope they would reconsider everything to do with this WHOLE project!!!
736	This is a horrible idea!! Aaron's creek is in very bad shape. There is no way a one lane road will be able to handle all that traffic. A roundabout is very bad solution to Greenbag road. The roundabout on the mileground has solved nothing, traffic still backs up.
737	My name is Steve Runfola and my family, neighbors and I must use Cobun Creek/Upper Cobun Creek Road 119/6 to access our homes. We have been reading your Greenbag Road EA.August 2020 document and we see that Aaron's Creek Road is named as a possible Detour for The GreenBag Roundabout project yet Cobun Creek Road is not named as a possible detour for the project. Cobun Creek Road is about 3 miles long and connects Kingwood Pike and Grafton Road. The Grafton Road/Cobun Creek intersection is about 50 yards from the Kingwood Pike bridge over I68. The Grafton Road/Cobun Creek intersection is next to Allied transfer and storage about 1 mile from Walmart. It is impossible for my neighbors, family and I to believe that Cobun Creek Road will not be used as a defacto detour during roundabout construction. People will use this road heavily no matter if it is an official detour or not. In the past we have all seen it used heavily for brief periods as a detour during road construction and automobile wrecks. Cobun Creek road in now being heavily used by light trucks busses and cars for MUB dam construction traffic and Upper Cobun Creek Rd is being used for heavy MUB dam earth moving and construction machinery traffic . At this point, Upper Cobun Creek has been virtually destroyed and Cobun Creek is not much more than a pig path. This has been going on for 2.5 years. The Greenbag road detour situation will force us to endure another 2 years of very heavy traffic after the MUB dam construction ends. We find that unacceptable. We also think it's a very good idea if The County and the DOT contact us if our area is to be directly impacted by major maintenance or construction. None of us had any idea that Cobun Creek may be used as a long-term detour and so no one that I know of attended the Roundabout meetings. My name and contacts are Steve Runfola M: 1-304-680-1340 Email: StevenRunfola@Gmail.com . Thank you for your service and have a good day.
738	Using Aarons Creek as an alternative route is not a viable option. The road is narrow and has been in disrepair for years. It is not suitable for traffic or heavy trucks. With increased traffic emergency response will be greatly hindered to the dangerous level. A roundabout these days seems to be the fix all rather than do the right thing and install turning lanes To allow traffic to flow through. Please consider this as notice of my disapproval of a roundabout at the kingwood pike/ Green Bag road intersection. I urge you to investigate a more common sense approach.
739	Everyone one knows the detour will not be able to handle the traffic.Winter time will be a joke! Keep those wreckers handy.
740	The proposed roundabout is one of the worst ideas I've yet to see or hear about here in Morgantown. The people who are in favor of it are definitely not resident of the Pike nor will they feel or experience the repercussions of something so mindless AND wasteful. This project is

	downright a waste of tax payer money. It makes absolutely no sense. Why are would anyone in their right mind spend MILLIONS of dollars on an area that is MAYBE AT MOST congested for an hour 5 out of 7 days a week. I don't know why a turning lane can not be installed or bring back the four way stop signs there - literally ANYTHING not as so drastic and daunting as a roundabout. I feel like the people are not being heard and those we've elected into office are failing us in being our representation. It's really a horrible thing when you have no say in something that will affect your daily live and may I add negatively. Here's just a few of the reasons why the roundabout is a ridiculous idea. There are many large trucks that travel the Pike daily. A roundabout will be a nightmare navigating with the heavy loads they carry. It scares me to think I'd have to share the road with a fully loaded truck in a roundabout at that location. This brings me to my next point. During the winter, that grade of hill along with the twists and turns is NOT suitable for a roundabout. I can see many sliding right through it causing damage to the structure itself and possible accidents with other cars. I actually have to plan ahead when coming down that hill in order to stop when I need to. If you go up to Pike not even a quarter of a mile, the roads are horrible!! They're falling over the hillside and the potholes are horrendous. I have to drive in the other lane to avoid popping a tire or destroying a rim. Also, that road does not drain properly. It's a hazard year round with laying water. You need to fix the roads before adding a roundabout. The proposed detour is an absolute joke. Whoever proposed this project and detour, have you tried the detour?! I'm serious. I won't want to leave my house if that's the only way to get down the Pike. I refuse to drive it because of how dangerous it is. Then to think additional traffic will be on it because of the detour, wow, you're really asking for accidents and a negative outcome. I am NOT in favor of this roundabout. Anyone who lives on the Pike knows this is a horrible idea and waste of our money. Please consider fixing the roads first. I honestly can not believe this roundabout is an actual thing. Whoever is pressing forward with this project should be ashamed of themself for not listening to the people that this affects most.
741	HAVE YOU CONSIDERED THIS? I am a homeowner on Aaron's Creek Rd, and in fact my driveway meets Aaron's Creek Rd and Summer School Rd. My family struggles to get out of our driveway now, and the speed at which most cars travel past is unbelievable most of the time. I have witnessed in excess of 50 accidents and have literally pulled accident victims out of their cars! In the past I've contacted the DOH to repair the potholes in front of my house as I am concerned that one day a vehicle will hit one and roll into my front yard onto my vehicles. To date nothing has been repaired! This road is horrible, and school buses are currently not permitted to travel it! What do you plan to do with school buses traveling down the Kingwood Pike to the schools in Morgantown? Do you plan to put them in danger also? You have not announced what you plan to do to control traffic through here! Do you plan to put a stop light at Summer School? If not, for the next 2+ years we will be in more danger than before! I know you put a traffic counter at lower Aaron's Creek Rd, but did you leave it there for a full 7 days? If not, you absolutely missed a full count! This road is a main route to the Sabraton area from the Kingwood Pike. I have lived on this road since 1989 and traffic has multiplied astronomically since then, and I have traveled to work to the Kingwood Pike to get to Morgantown. The 4 way stop at Greenbag and Kingwood Pike was not a problem, as most people just took their turn to get through. Turn lanes on Greenbag Rd and the Kingwood Pike absolutely make more sense, as well as stoplights with sensors to control the amount at any given time rather than spending millions of dollars for one area to make another area worse! I implore you to reconsider the roundabout as the best option and make turn lanes instead. I also would like a reply as to what you plan to do to Aaron's Creek Rd in the near future. Thank you in advance for your reply.
742	"Need safe sidewalks/pathway from Dorsey East to the end of the project" would be helpful. Thank You.

743	Dear DOT Representatives: I write to express objection to the proposed roundabout on Greenbag road. The proposed project would destroy the greenspace that the Hastings family and Conscious Harvest Cooperative use for the community garden. This space has a significant positive community and economic impact. The Conscious Harvest Cooperative and the Hastings family have rallied a large segment of the community around gardening, food access, and the value of community. The impact they have on the community is no less than that of an established church or social service organization – helping to gather people for healthy activities, donating food to the poor, educating via workshops, and preserving greenspace in an urbanizing area which helps public mental and physical health. This space has also allowed Conscious Harvest to have a significant economic impact by supporting growth of small businesses, including ours. Through their programming and fundraising, for the past several years Conscious Harvest Cooperative has raised funds to purchase several thousand dollars of biweekly food boxes from our farm business that we then provide to qualifying low-income families through a "Farm to Families" partnership we have with the Shack Neighborhood House. In this way, Conscious Harvest and the community garden space have had a significant economic impact on our business and on the daily budget of many of low-income Morgantown families. We are also aware of at least two entrepreneurial endeavors that have been incubated directly at the greenspace and grown into local food and farm-based businesses. If this greenspace is eliminated for the proposed roundabout project, Morgantown will lose Conscious Harvest Cooperative's valuable efforts to promote community, support economic growth of small businesses like ours, and directly incubate other farm and food-based businesses. This will have a direct economic impact on our business and others, and will also negatively impact the low-income families who we provide food to through this programming. Thank you for considering these economic and community impacts. We hope you are able to rework the project to avoid negative impact to this greenspace and Conscious Harvest Cooperative. Sincerely, Ruth Mary Oldham Mountain Harvest Farm
744	I feel the round about is a horrible idea! All that is needed is a turning lane on greenbag road side. Aarons creek road can not handle all the traffic! It itself need much needed repair and repaved. It is not big enough to pass in most places! I
745	I recently read in the paper this project will negatively impact a historical farm on Greenbag Road. Morgantown was once a thriving farming community. Farming has been all but expelled from the city limits of Morgantown due to the demand for housing and the expansion of WVU.

	While the Hasting's farm too is outside the city limits, it does sit on the boarder and remains one of the last reminders of what Morgantown once was. In the drafting of your final plans I sincerely insist you consider the negative impact your project will have on a multi-generational farm.
746	All we need is a turning lane. Drive up the pike the road is falling apart use the money to fix the road. NO ROUND ABOUT
747	We don't need a Roundabout take the money and put in turning lanes and do what really needs done pave the Kingwood Pike.
748	We don't need a Roundabout just turning lanes and fix/pave Kingwood Pike
749	My name is Orlando Cruz About three years ago I met the Hastings and at this point I knew nothing about nature, growing, farming, working hard, dedication and really understanding the agriculture aspect for now and our future. I've also grown and many other aspects of my life and tremendously I'm doing fairly well myself now. I live on this little farm and every night it's quite peaceful out here growing and becoming one in nature. I also know I walk to work on a daily basis and believe me it almost seems like these cars are more in a rush and don't even know how to approach a stoplight like this one. Quite funny until I get hit by car so it's more than just a roundabout. Really sad to watch people driving their cars heading nowhere fast not even realizing life and the bigger spectrum of things. At this point it's not the matter of right and wrong but simply looking at it for what it is. Truthfully we think we know what's best for everyone but in all reality this is a learning process for everyone to learn and grow and experience something greater than our perception of how we view the world today. Just know Mother Nature is within all of us and maybe it's time to take two steps back and ask yourself what would Mother Nature and our ancestors want. I humbly ask to reconsider and try reaching out to the community on a spectrum where something magnificent can it be done instead of us trying to throw money at a situation that we know it's not going to be work for anyone in the long run. Sincerely Orlando Cruz
750	Dude. What the heck is this I hear about an extremely expensive and useless roundabout next to your farm? When I visited you about a month ago I recall you saying the proposed roundabout would potentially kill your farm! Please forward this email to whoever needs to hear how DAMN beneficial your cbd products are for me! For one, when Tito my lil chihuahua, pulled his acl your cbd tincture IMMEDIATELY helped him with his pain and stiffness. I've been continuing to give him that tincture on his food since the event a only gotten so much stronger, healthier, and happier. You have by far the most affordable cbd products and it will be a true financial impact on me if I have to get cbd products from our local farmer's markets here in CO. They charge unreasonable prices for less than half the amount you supply me with. The cbd tincture I've also given to my father who some would call an alcoholic and we've all seen a drastic improvement in his mental and his urge to drink. He now goes days without drinking when it was a several drinks per night occurance. Lastly, I think I read this is going to cost the townspeople 10-miilion dollars in taxes. Are your local politicians idiots?! When I visited you, I recall exactly the light they're considering this roundabout for and it had ZERO back-up. I was there from Thursday through Monday a nd saw the rush-hour times at that intersections and there were never any issues with back-up.

	Please, please, please send this email to someone that has some common sense and compassion for local farming, because someone's clearly getting bought out to suggest such a stupid construction project. I live in Fort Collins CO, well you know of course, we grew up together lol, and we have a significantly higher population and the roundabouts put in place here, that weren't putting local farms AT RISK of being closed, are hated by everyone. People don't know how to use them correctly and I can only imagine how useless and devastating this roundabout on your farm will be. Please send this to someone that has a say in things.
751	Roundabouts are generally bad ideas in the US, but particularly when it is unlikely the roundabout will accomplish the intended goal when a far less expensive alternative is available. In this case, a roundabout will cost a great deal more than a turning lane, and is not likely to reroute truck traffic or reduce traffic wait times more than a turning lane would.
752	Please add a pedestrian crossing to the Greenbag Road development plans. Thanks
753	This roundabout is a horrible idea! With all the log trucks, cement trucks, and large equipment trucks traveling the pike for the sawmills and building of the Cobun Creek reservoir this idea will cause some big issues. I have lived in the area for 36 years and we try to avoid Aaron's creek road because it's so narrow and full of potholes and now we're supposed to use it daily for up to 2 years? We have nice vehicles we pay taxes on and we don't even have nice roads to travel on even though we pay taxes for that as well. All of the connecting roads to this intersection need repaired way more than we need a new pointless intersection. The intersection that is there now isn't very old and works fine. It is also a shame that it will cut into the people's farm property that they actually use.
754	the roundabout would cause a hardship on a family farm along with it not making sense for the truckers. A turning lane is more appropriate and logical.
755	White Park to Dorsey's Knob/Sky Rock is a key connector trail for hiking and trail running. Potential routes require crossing Greenbag Rd. Please add a Greenbag Rd pedestrian crossing to the plans for Greenbag Rd.
756	I am in support of the Greenbag Road Improvement Project as proposed.
757	Please consider making Greenbag road safely accessible to bikers and pedestrians for the entire length of the road. This Will provide safe access to schools and businesses for those who do not drive, and it will undoubtedly create a valuable resource for the community. As an avid cyclist I never ride Greenbag because it is too dangerous. This prevents access for me to certain areas. Thank you!
758	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
759	We need a safer way to walk and bike to school. Now is a great time to make Morgantown a bike and pedestrian friendlier city.
760	1. Would kindly ask that a sidewalk also be included to the east of Dorsey/Greenbag intersection, as this is a treacherous stretch with, as i see it, no solution in the proposal. 2. Cross walk b/ SafeLite or Good Year to Giant Eagle would also be helpful. 3. How wide is the propsed sidewalk along Greenbag? Space enough to accomodate cyclists and pedestrians would be helpful, particularly given how much traffic there is on that stretch.

	Thank you for the opportunity to voice these concerns.
761	I'd like to submit these points for design consideration: First off I do not support any type of roundabouts. Just a terrible idea. I would however like to see the following improvements. 1. Sidewalk the entire length of the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer. 2. I would like to see a sidewalk on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3. I would like to see a sidewalk the entire length of Luckey Lane 4. The lack of pedestrian and bike infrastructure is a major concern. I would like to see at least a sidewalk on the north side of Greenbag or a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern end of the project. 5. I would like to see a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall). Pedestrians and bicyclists need to be supported along this entire project with a 10-12' multi-use path or sidewalk separated from traffic in many areas.
762	The roundabout is not needed. The road is only backed up Monday thru Friday for 15minutes. This does not warrant spending 10-15 million dollars. A few years back someone decided to put curbs up a short distance on the Kingwood Pike from the 4-way intersection. These curbs made travel treacherous in the winter, Water does not drain into a ditch but onto and down the road. Resulting in a sheet off ice going down hill at an angle.... THIS needs rectified above everything else. I DEMAND that each and every counsel member travel the "proposed" detour of Aaron's Creek BEFORE any decisions are made. Aaron's Creek is a one lane (in some cases 1/2 lane) road with a steep angled grade with NO GUARDRAILS!!!! I do not travel this road dry let alone wet or in the winter time. You will be putting the safety of all the kids that rides school buses that have to travel this road in danger! Wake up! Think of others! This will not deter trucks from going through town, AT ALL. We have ALOT of log trucks that travel the Pike, how do you think a roundabout will work out? Log trucks full of logs going through a roundabout????? They will for sure have to use both lanes to do so. The only appropriate solution to remedy the inconvenience of those have to waiting in traffic for a short time are TURNING LANES!!!!
763	Let's build it!
764	My family and I are avid outdoor enthusiasts. My three boys attend Mountainview Elementary, South Middle, and MHS. We frequently drive Greenbag Road, but in its current state, we would not dare ride our bikes or walk it. With the proposed changes to the Greenbag Road, I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike. With such simple improvements, so many will be positively impacted. Let's make Morgantown even better!
765	I've read through the EA document. This process has been in planning for a long time, and I was happy to see so much thought and effort in presenting different options for improvements that are necessary as our city continues to grow. In the document itself, there is the admittance of a negative impact due to widening the road and affected the streams, wetlands, and water quality in the area.

	While this is to be expected from new construction, I was disappointed to not have found a comprehensive plan to improve water quality and enhance our natural resources in this area. If any time is right to work sustainable measures into designs; it is now. West Virginia needs to thrive in promoting and sustaining its natural resources, not just as a principle, but for economic reasons. Our natural resources are the pinnacle of why we have so much tourism. That stewardship starts at the local level, and we need to set an example for the rest of the state for how to protect our most precious asset. So I can't agree with the current plan when the language in it is resigned to negative impacts only as it relates to natural resources. If this plan took a proactive approach to water quality and environmental restoration then I would stand behind it fully. In looking at the plans I am confident that these experts in civil engineering can create a plan that is cohesive with the environment. The added cost for such planning and design would be returned to us as residents in increased land value and create demand for people to move into our state. Imagine if we took initiative in this way to be creative with our plans for growth and infrastructure. The cost we will continue to pay for the health of our neighbors will only grow if we continue our apathy towards protecting the environment. You only have to look as far as Fairmont to see what happens when we ignore the health of our natural resources. The cost to our state by sacrificing these resources cannot be counted. While there may be federal protections for these area streams; I believe I am speaking for all West Virginians in saying that we don't want you to meet minimum guidelines. We have more pride than that. Come up with a plan that would improve water quality post-construction, or don't proceed.
766	Round-a-bouts in Morgantown are not the solution -- they are the problem. Unequal flows of traffic from different sides cause congestion and this is exactly what is going to happen. I urge you to rethink a round-a-bout on Greenbag Road/Kingwood Pike and also Mississippi Street. Thank you for your consideration.
767	We are vehemently opposed to the proposed roundabouts to be constructed on Green Bag Road and urge those in the decision-making process to terminate these roundabouts. First, why not simply create turn lanes on each side of the intersections as an alternative, thereby saving time and resources. Second, these savings could be used to improve nearby roads that are in terrible condition and may never be improved once these roundabout funds are expended. Third, the unintended consequences occurring during the construction of the roundabouts, of which there are many, are simply unacceptable. For example, on the Green Bag/Dorsey roundabout, diverting traffic onto the Kingwood Pike, then onto Aarons Creek, followed by Lower Aarons or Upper Aarons Creek Roads will create safety hazards of unmeasurable magnitude, as the volume of traffic vastly exceeds the capabilities of the Aarons Creek Road segments being used as a detour. Fourth, once the roundabouts are completed, will there be any attempt to fix the detour roads that were further degraded from dramatic increases in use. I doubt it! Has anyone done a study to determine these potential consequences? Finally, isn't it time for the local bureaucracy to embrace the

	concept of Occam's Razor for once; that the simplest solution is generally the best solution. If something absolutely must be done, then BUILD TURN LANES!
768	There is no need for a roundabout at the intersection of Greenbag Rd and Kingwood Pike/Dorsey Ave. To say that safety is the biggest issue, with large truck traffic following at a close second is laughable. A roundabout will not deter truckers from using the area and safety of roundabouts is highly questionable. Widening the roadway at and approaching the intersection to install turning lanes with new signals will be the most appropriate solution to this traffic problem in this area. Even as the intersection functions currently, there are no issues with the flow of traffic with the exception of the busy times for a couples hours a day. It doesn't make much sense to spend years and millions and millions of dollars worth of taxpayer money to "fix" the problem. In addition, the use of Aaron's Creek Road as a detour is absolutely ridiculous! That road is a high traffic cut through anyway and now adding all the detour traffic means more accidents, etc with the condition of road. Has anyone looked at the condition of the road? Will there be road improvements such as widening, drainage and paving prior to the detour? This road CANNOT handle that amount of traffic without improvements. Also, the cost of the improvements to Aarons Creek Road in addition to the cost of the roundabout is asinine. Widening and turn lanes for Greenbag is a much more logical solution to your problem.
769	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
770	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike. This would be a major asset to our community, particularly so that my kids attending Mountainview and South Middle school can safely access resources such as White Park and stores in the Mountaineer Mall.
771	We are advocating for an alternative intersection design that can be supported by the majority of landowners affected. The name of this design is "Option G." We believe this design is what has been promised from the State to landowners for over ten years. Here is "Option G" in clear language: The Environmental Assessment (EA) considers three alternatives for the intersection of Greenbag Road with Dorsey Avenue and Kingwood Pike: Options D, E, and F. Another option should be analyzed and included in a revised EA that combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes, for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA. These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would: · improve the safety and access for motorized and non-motorized connections; · reduce impacts to natural resources; · preserve significantly more of the adjacent farmland of statewide importance;

	· reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands; · limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation; and · reduce construction costs.
772	test
773	While I am excited that the GBR corridor will see some improvements I'm left sitting here thinking about how WV always seems to build infrastructure without significant thought to pedestrian/bike traffic that would ease the load on what is already overburdened roads. There should not be any consideration of improvement along this corridor without sidewalk and dedicated bicycle lanes as part of it. There are large communities of residents that could easily walk or bike to Mountaineer Elementary School, South Middle School, and continue up the road to Family Dollar, Giant Eagle and other business. It seems all mention of sidewalk of any kind stops at Lucky Lane providing sidewalk access only from the west. The majority of residents actually live to the east with four subdivisions and a large apartment building complex to the east of lucky lane. You must extend the sidewalk and I would suggest dedicated bike lane the full length of the project. I am a bicycle commuter and utilize this road often to get to work. I see other cyclists also regularly using this road but the narrow lanes and amount of truck traffic make it unsafe for any but the most courageous. A bike lane would provide access to all of those residents to white park in addition to other services and shopping. If the sidewalk (or preferably bike line) are not extended the full length of the project while it is in construction, it will never get done and we will be left with additional expansion projects along the corridor with no ability to add because there would be a significant gap in the existing infrastructure to do so. Additionally, it would be beneficial to the number of residents who live in the area to post "no engine braking" near the corner at Morgantown Printing and Binding. The increased number of trucks along this corridor is already making the noise level problematic and this will further detract from the existing residential neighborhoods. As to the structure of the intersections, I am extremely disappointed in the development of the roundabout near the old atomic grill because it takes so much of the farm that has been described as (a non-productive farm). For many years now this farm has been supplying thousands of pounds of locally grown produce to food pantries in the area to help those among us experiencing food insecurity and an opportunity for community members to provide for others through their gardening expertise. However, I do believe the roundabout would be the best solution for traffic. The second option for a dedicated turn lane with dedicated signal lights would be sufficient for the amount of traffic currently being experienced at this intersection. Those turn lanes would need to be of sufficient length to accommodate the number of vehicles needing to turn and would likely be best if they continued on as middle turn lanes for the full expanse of the proposed updates.
774	I own two businesses on Lower Aaron's Creek Rd. This road is mostly single lane and is not in good repair. The thought of rerouting traffic onto Lower Aaron's Creek is asinine at the least. Before doing this the road should be widened and resurfaced. The bottom line is a roundabout is not needed at that intersection when you could just widen the road by 10 feet in each direction and add a turn lane. Also, I read that the roundabout is designed to handle tractors with 48' trailers. Considering the average semi-trailer is 53' I wonder about the qualifications of your engineers.

775	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
776	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike!!!!!!!
777	Improvements on Greenbag Road can demonstrate a 'complete street' model facilitating auto, bicycle, pedestrian access and innovative stormwater management. Connecting pedestrian and bicycle access from housing to retail businesses and schools needs be a priority.
778	This is going to cause a big hassle and problems for my families
779	Updates to the Greenbag Road corridor will be a much welcomed improvement to transportation in the region, as it is a main E-W corridor in the southern Morgantown metro area. I frequently travel Greenbag Road for purposes of work, shopping and taking my children to school, and I visit many of the establishments along Greenbag Road for numerous errands and community events. I support the roundabouts as designed, especially as they will address the currently obstructed view at the intersection when heading south on Dorsey - this makes a right hand turn dangerous, particularly when large vehicles (school buses or Mountain Line buses are turning left onto Dorsey from Greenbag (or turning right for that matter). Sidewalks or multi-use path are sorely needed along all roadways in this area. I can't tell you how many near misses I've witnessed and experienced along Greenbag Road and Lucky Lane, which is particularly troublesome in the vicinity frequented by school children and school busses heading to Mountainview Elementary. There is a lot of high-density housing in the area between the intersection of Dorsey and Mississippi Ave with Greenbag Road. As such, many people walk this stretch of Greenbag road at all hours of the day. Particularly in the winter, when it gets dark during the high volume times of the day (~7 am and 5 pm), pedestrians and cyclists are forced to walk or ride in treacherous conditions. I hope any improvement to this Greenbag corridor will considerably improve the safety of pedestrians and cyclists by including a multi-use path. Also, events at Mountainview Elementary are unnecessarily unsafe due to traffic routing via Luckey Lane and Greenbag Road which lack sufficient pedestrian access. This has been heightened by opening of the Family Dollar that increased foot traffic across Lucky Lane. Sidewalks along Lucky Lane are needed, as is a cross-walk near the Family Dollar access.
780	Like many in my neighborhood, I am very opposed to the roundabouts that are planned on the Greenbag Road. This area needs to be more pedestrian friendly, and a roundabout is moving in the wrong direction. There are neighborhood businesses, dance studios, yoga studios, a grocery store, that we could all walk to if there were sidewalks. I'm also opposed to taking the farmland from the Hastings family - they have built a viable business from that land and it's moving in the right ecological direction. As we said years ago when the traffic light was installed at the intersection with Dorsey and Kingwood Pike, a turning lane and left-turn signal would clear up the few problems that develop at that intersection. A cheaper solution, and the money for the roundabout could be used to fix up roads that more in need.
781	Please provide pedestrian and biking access/travelways the entire length of the redesign project. My family lives within walking distance of Greenbag Rd. It would make a huge difference to us and our neighbors to have better, safer, healthier access to schools, parks, and businesses along this route. Specifically, I would ask you to include:

	1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) sidewalk the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative 5) (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, then please include, at a minimum, a sidewalk or multiuse path from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic. I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. Pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. Thank you for your consideration, Gwen Bergner
782	I don't understand how this project could get approved. There is a working farm and business at this intersection that would be destroyed if this project goes through. This is totally unacceptable.
783	Greenbag Road is a major connector and can complete the Morgantown loop making travel in Morgantown quicker and easier. I have two dreams for this road, though seemingly incompatible, I think with some planning quite possible.

	1) Connect the Deckers creek rail trail with greenbag road with a separated ped/bike path 2) Strongly encourage the trucks to take this route instead of through downtown. For god's sake we can never raise the bar in morgantown without redirecting the trucks. They are an absolute obstacle to prosperity.
784	These road upgrades are not necessary and will shut down a locally owned business that is beneficial to our community.
785	I am friends with the owners of the hemp farm and CBD business. I am familiar with this intersection. I do not see how a round about would be beneficial for this particular intersection, especially when it would cause and entire family to lose their farm and business.
786	I'm very glad to hear of the intended addition of pedestrian and bike infrastructure along Green Bag road. Pedestrian and bike infrastructure along green bag road are vital to allowing/promoting growth (and realistically limiting the decline) in these sections of town. There is currently ZERO safe pedestrian access to any of this part of town. However, it is incomplete and unfortunate to not include some form of pedestrian access east of Dorsey (even if not directly on Green Bag). In brief, supporting the suggestions of Christiaan Abildso: I'd like to respectfully suggest these points for consideration in the design: 1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative 5) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback as noted above. Thus, I strongly recommend (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a sidewalk or multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic. I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders.

	I greatly appreciate the opportunity to comment on a project that will have a major impact on our area for decades. Many of us have been working for improvements throughout the entire region for pedestrians and bicyclists, and this corridor is a critical piece of the puzzle. Thank you!
787	The land in which the state is trying to build on is someone's (Jenn Hastings) property. She uses the land as a farm to grow product in which she sells. She has a company to sell her products that work for many individuals. The farm would be in danger with this road going in. Causing a loss for her very real and helpful company. It is important to stop this construction as the farm is what she grows her product on.
788	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
789	I strongly use you to have a bike and pedestrian friendly walkway all the length of Greenbag Road from Sabraton to 119 so that families and workers can safely bike along this roadway to get to work and to access White Park and all the recreational opportunities there. Right now, it is very unsafe to walk or bike on this road. This would make Morgantown and much more bike/walk friendly community. It would also connect the rail trail in sabraton to the rail trail on Monongalia blvd. This so important to the health and happiness of our community and provide an alternative mode of transportation for our workers. This will make Morgantown a much safer biking and walking community and will pay off exponentially in terms of health, happiness and productivity.
790	Another option needs to be taken into consideration as the leading alternative for the roundabout at the Kingwood Pike and Greenbag Road intersection. Neither the State DOH, nor MMMPO seem to want to acknowledge the correct solution to current and future traffic flow in that area. Whether it's a lack of due diligence, or political pressure from the City of Morgantown to alternate truck traffic, is unclear. Left turning lanes ONLY on Greenbag, with arrows allowing protected turns onto Dorsey Avenue and Kingwood Pike would be highly efficient. Dorsey and Kingwood Pike do not need added lanes to address traffic flow, which in turn reduce construction costs, reduce property acquisition costs, and do not displace any residences. Traffic congestion peaks during school dismissal and the typical 5 o'clock rush, but otherwise flows efficiently(what parts of town don't have the same peak use, yet operate sufficiently without a roundabout)?! Wasting time and money on the roundabout will not alleviate traffic patterns through downtown; its simply the shortest, easiest route for trucks. The Greenbag corridor is quite developed already, and to say that the roundabout is necessary to accommodate future traffic levels(that couldn't be remedied by turning lanes), is a false representation.
791	I encourage sidewalks and bike lane along Greenbag Road so that people can safely access the schools, parks, trails, and stores along that stretch of road on foot or by bike.
792	never should’ve put a light in without a turning lane to begin with!
793	We don't need another freaking roundabout.
794	Why not just go back to a four way stop. Like a few years or so back. Those work fine. Nope round about are the answers to everything in Morgantown. I remember it for many many years.band my dad was great friends with Dewey. Prayers that don’t do this to the farm
795	We definitely don't need another round about
796	Good Lord, we're back to this again? I was at all of the council meetings during the last go round. It's unnecessary... but so was closing off the connector road in Sabraton but here we are.
797	Instead of putting a roundabout at the bottom of the pike they need to do major work on the pike itself to the overpass. It's atrocious!

798	The roundabout is worthless, case in point look at the mileground. No one knows how to use it, and unless you are going to teach every single person in town how to use it it will do absolutely no good! Having a small community farm there is wonderful. I tell my children about it every single time we pass. We see them working and vegetables growing and it is just a very positive thing in a negative world. It is very sad. You could use that money to fix the roads around our town. Also, diverting traffic across Aaron's Creek Road is ridiculous. That road has horrible traffic as it is. It is a single lane road that never gets plowed and people slide all over it on a good day. I cannot imagine upping the traffic more in that area! You are looking to make it absolutely miserable for every single person who lives on that road or that has to travel across it. Please reconsider waiting both your time and money on this horrible idea.
799	How many people that are encouraging roundabouts have driven tractor trailers for a living? Cars can maneuver really easy in roundabouts, it's a different story for larger vehicles
800	I travel Greenbag Road routinely as I live in a neighborhood near this road. I feel strongly that the improvements to Greenbag Road could and should be an opportunity to make it safe for multiple types of users- motor vehicles, pedestrians and cyclists. I hope that the DOH takes all users into account when making these decisions. There are residential neighborhoods, schools, parks, and a grocery store on this road that need to be considered as destinations. I witness walkers and cyclists routinely trying to navigate on the sides of Greenbag Road, a currently dangerous situation. Along Greenbag Road there is a great need for pedestrian / bike infrastructure. The safest option for this is a 10-12ft multi-use path. The path, separated from traffic, would be located on the north side of Greenbag Road the length of this project which would result in a safe route to hundreds of residents in neighborhoods and housing developments and connect schools and city parks. Instead of filling in missing sidewalk, a separated multi-use path would be cheaper, safer, and would accommodate many types of users. It would not only be safer, it would feel safer, and thus would get more use. There needs to be a designated, safe crossing of Greenbag Rd. to serve residents from low-income neighborhoods who travel on foot and by bicycle to reach the grocery store. Such a crossing will also serve the community by facilitating the connection of two key recreational areas—White Park and Dorsey's Knob Park. Adding a pedestrian signal at the current signalized intersection of Greenbag Rd and Mountaineer Mall would seem to be the most logical location for a pedestrian crossing. If the project cannot be extended to the current signalized intersection, adding a HAWK beacon (High-Intensity Activated crosswalk) at the current western terminus of the project would serve a similar purpose. I have no issue with the planned roundabout though I prefer a design with the least impact to the community garden. I support roundabouts in general as they reduce air pollution since cars don't sit at a light idling, slow traffic down, and reduce the likelihood of T-bone car crashes. I would also like to see a sidewalk on Lucky Lane. Thank you for the opportunity to comment on this project. This need is also well-documented in the MMMPO bike /ped plan that also had public input. I hope you listen to the needs of the community as a whole and provide a safe option for pedestrians and cyclists

801	A huge roundabout in this location seems absolutely ridiculous to me especially at that high cost. The traffic didn't previously back up often when there was a four-way stop except at a few very precise times each day. The previous actual four-way stop that was there was one of the best clearest four way stops in the state. Adding the light did not fix the problem; It exacerbated the problem. Now at any random time of day you may have to sit waiting for the little bit of traffic that prevents a left turn. Out side of that , It's still backed up at certain times of day because there's no left turn lane.If a left turn lane is added we can go back to almost as good as it was with a four way stop. A roundabout is ludicrous. Who has their thinking cap on regarding this project?
802	1. Having a sidewalk all along the north side of Greenbag is a good plan for pedestrians. However, a multi-use path would be safer and more convenient for both pedestrians and bicyclists. 2. Sidewalk as proposed on east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview Elementary, looks good. 3. Sidewalk on Luckey Lane is good, but better would be to extend it the entire length of Luckey Lane. 4 Roundabouts are good as proposed. 5. Lack of pedestrian and bike infrastructure from Dorsey intersection to the east? Should have a five foot sidewalk on north side of Greenbag with paved shoulders or bike lanes on both sides. Better yet, a 10-12 foot multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern end of the project. If putting infrastructure in the Luckey Lane to Dorsey Ave section is not feasible, install a sidewalk or multiuse path from the Luckey Lane-Greenbag intersection to the eastern end of the project. 6. Paved shoulders and sidewalk from the Dorsey intersection to the west won't be enough for bicyclists because of the traffic speed and volume. Alternative to consider: 10-12 foot multi-use path, separated from the road. 7. Need a safe pedestrian crossing from the western end of the sidewalk on the north side of Greenbag near the Goodyear Auto building to the south side of Greenbag. A pedestrian hybrid beacon would be helpful. 8. In general, we need safe walking and biking space in this area that protects pedestrians and bicyclists from vehicle traffic, and we need as much width as possible to be sure pedestrians and bicyclists are safe as they share the infrastructure. Thank you very much for the opportunity to offer comments on this important project.
803	No roundabout is necessary. If anything, the addition of a turning lane would suffice. I can't imagine the delays the construction of this alone will cause for people living on the Kingwood Pike and Preston county. Also, taking away the farm at the bottom of the Pike would likely just add to more food insecurity that this state already faces. There is no real need for this roundabout. Invest the money in the existing crumbling infrastructure. Or, perhaps create an interstate exit onto the Kingwood Pike. That would make travel to and from the Kingwood Pike and Preston county much more convenient, and therefore, clear up traffic on the Greenbag Road. A win, win really.

804	Dear R.J. Sites and all Interested Parties concerning: FEDERAL PROJECT # STP-0857(019)D / STATE PROJECT # U331-857-0.67 / (GREENBAG ROAD IMPROVEMENT PROJECT) I am a Concerned Party regarding this project, as I farm garlic within the boundaries of disturbance of Option F. This project will cause irreplaceable to damage. I have farmed garlic for over 8 years in this location. The labor materials and time I have dedicate to farming garlic is significant. I reserve the right to seek damages for time/labor/materials, current distress and duress, and future damages and/or remedy if this project continues as planned, rendering me unable to farm garlic in this location.
805	In the spirit of the purpose of NEPA to "encourage productive and enjoyable harmony between man and his environment," I am writing, at the earliest opportunity, to inform the Federal Highways Administration and West Virginia Department of Transportation of my business located within the area of disturbance of the proposed Greenbag Road Improvement Project. Please accept these comments and this evidence as part of the formal federal process of NEPA and the period allowing for official public comment. In addition to providing this information to the agencies (federal and state) as comment, I am also providing you this information to be considered as newly discovered information given that the information provided in this letter is providing evidence to correct flaws in the existing condition as described by the project in the Environmental Assessment (EA). Joy And Hemp Universal LLC, a woman-owned small business, a WVDA licensed hemp farm, and regional agriculture resource, is located at the southwestern corner of the intersection of Dorsey Ave and Kingwood Pike, Parcel ID: 31-09-048A-0011-0000, 09-48A-001000000000, and 08 10005400100000. The acreage is 2.7810 AC, 1.752 AC, 2.295 AC, respectively. The entire acreage, 6.828 acres, of our farmland would be impacted directly and indirectly by the preferred alternative for the intersection design, "Option F", resulting in irreversible and irretrievable commitment of resources which equates to a loss of natural resources, loss of historical and cultural resources, loss of prime farmland, loss of economic revenue, and loss of my property which would be taken from me involuntary. The EA is intended to provide opportunity to describe and evaluate the impacts to social, cultural, natural, economic, and environmental resource factors. In our case, it has done none of the above because the EA failed to identify the property as agricultural land with prime farmland (farm land of statewide importance), the economic value that this land generates through agricultural production, the loss of historical and cultural value which is known by the landowner (myself) but not properly surveyed, impacts to hydrologic and watershed effects to receiving streams from disturbance, effects on the local food system including loss existing food sources, and displacement of a woman-owned small business. The EA incorrectly assesses the classification of land use and lacks the proper designation for the soil resource as prime farmland (farmland of statewide importance) where our business, Joy And Hemp Universal LLC is located The EA is does not properly identify the soil map unit where the property is located at as soil of statewide importance for farmland. The Clarksburg soil series is known to be a productive agricultural soil. The soil and land are utilized by Joy And Hemp for agricultural crop production. The EA should be corrected regarding the classification of land use and designation for this property.

	Table 7 refers to the NRCS Form CPA-106. If this form was utilized to categorize the property as nonproductive farmland, then this assessment is in question because it was not done in cooperation with the landowner or with the knowledge that current prosperous agricultural production is being conducted as the present-day land use. Continued...
806	Continued from #805 The West Virginia Department of Agriculture acknowledges as such through an active permit for hemp cultivation on this property. Completed forms for assessed properties are not included in the EA or referenced as part of the project record in any manner to show where they were applied and to which landowner. The EA must adequately display where this assessment was conducted so as to be able to show, as part of the analysis, which farmland was not deemed productive—just as the EA shows which farmland is productive by identifying the prime farmland not only in maps but also in the effects and in the comparison of alternatives. This full disclosure of the site-specific nature of the assessment would then be a transparent analysis and equally treat all landowners with regard to assessed land use for agricultural purposes. Nowhere in this EA does it disclose which segments of land underwent the process of evaluation using the NRCS Form CPA- 106 or who conducted this analysis. Disregard for the correct land use and soil information regarding this property in the EA (and corresponding tables and descriptions) has resulted in omissions for direct, indirect, and cumulative effects for prime farmland, disturbance acreage, water quality, heritage and cultural resources. We assert that inadequate data was made available to government agencies by the hired contractor identified in the EA for decision-making. The EA must be corrected to include the economic, socio-economical, environmental, and farmland impacts due to the loss of the productive agriculture business and loss of soil of Statewide Importance if the preferred alternative were to be selected. This same information and analysis should also be done for all alternatives to provide an accurate comparison of alternatives and the tradeoff for each alternative considered and analyzed in detail. Due to COVID-19 and the restriction and limitations (as direction provided by the U.S. Government through the CDC and the State of West Virginia through the Health Department) this pandemic has brought upon the country, changes in daily operations of all businesses across the country, the 2020 federal election, and other pressing matters during this public comment period; National, State, and local environmentalist groups, farming organizations, food security advocacy organizations, and conservation agencies are just becoming aware of the impacts of the proposed alternative and the marauding of Federal and State Transportation Agencies. Therefore, as with many activities across the country, an extension of the comment period and opportunity to provide new information and findings by the public must be granted to allow for participation in a safe manner. Within the alternatives, the Government should be prepared to identify the economic effects from the loss of farming income and other effects

	by a conversion of prime farmland. The analysis must also identify mitigations for both the loss of the prime farmland (farmland of statewide importance) and losses and damages incurred to our business, current economic revenue and projected revenue based on the business plan and future operations. Since beginning farming in 2018, Joy And Hemp Universal LLC has made substantial investment into start up at property located at the intersection of Dorsey Ave and Kingwood Pike, Parcel ID: 31-09-048A-0011-0000, 09-48A-001000000000, and 08 10005400100000. This would need to reconciled. We are prepared to provide evidence of this investment and help the EA correctly identify those direct losses from each analyzed alternative. Given the sensitivity of personal financial information and proprietary claims for the value of the losses, we will not be providing this information as part of this letter but rather through a formal submission of confidential information to the agencies. Continued...
807	I have been watching the planning for the entire Greenbag Road project. I strongly encourage the WVDOH to incorporate all forms of transportation that will result in a corridor that encourages people of all ages, abilities, economic levels, and is inclusive to our whole community. In order to do this, the corridor needs to have safe places for people to walk, bike, utilize disability modes of transportation, and other methods because this corridor connects key schools, parks, shopping areas, and business in our town. Providing the opportunity for people to use alternative forms of transportation allows them the freedom to choose to keep our communities healthier, reduce impacts on roadways and air quality, which provides long-term and forward-thinking financial benefits to our WVDOH and funding. Providing better alternative transportation options also benefits communities through the attraction of younger and active professionals, which has been shown to be key factors in attracting businesses. Thanks for your time!
808	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike. As an avid bicycle commuter, I would appreciate the addition of a bicycle lane to ensure my safety and the safety of those around me as a travel to and from my destinations. Thank you
809	Continued from #806 No surrounding areas within the 6.828 acres affected would remain farmable for hemp cultivation due to the photo responsive nature of the hemp flower. The crop would be affected by light pollution from the artificial lighting needed in the preferred alternative. The plants are extremely valuable in today's market compared to other commodity crops, and substantial losses to our business would be incurred with the implementation of the preferred alternative. Further, our business may incur unforeseen losses due to this intersection design. Part of Joy And Hemp Universal LLC's mission is to help other farmers in West Virginia. As a result of the construction of the preferred alternative, the educational programs that occur on this location would be destroyed. Those programs are supported by a number of local hemp farms, and other farmers, and WVU research students. This social impact was not identified in the EA and the loss was not accounted for in the effects analysis. Loss of this space for such programs would cause damage to our business and others and must be remedied or mitigated if the project were to continue as described by the EA.

	I am available should you have questions. Thank you!
810	1. INTRODUCTION In August 2020, the West Virginia Department of Transportation released an environmental assessment (EA) for proposed improvements to Greenbag Road located just outside the city limits of Morgantown in Monongalia County, West Virginia. The EA was prepared by the West Virginia Division of Highways (WVDOH) in cooperation with the Federal Highway Administration (FHWA) to assess impacts from proposed changes to reduce congestion and improve non-motorized connections. Traffic studies cited by WVDOH find that major intersections are impacting the flow of traffic on Greenbag Road and that expected growth in the region will lead to continued deterioration to unacceptable levels. The EA describes options for improving traffic flow, referred to as "alternatives" in the report. Alternatives include two options for road widening, which include different lengths of new turning lanes on Greenbag Road, as well as turning lanes on Dorsey Avenue and Kingwood Pike. The EA also presents three options for configuring the two main intersections in the project area, including turning lanes in all directions and roundabouts at each intersection. In total, six new configurations were reviewed along with an alternative where no construction would be undertaken. The EA references previous planning work done by the Morgantown Monongalia Metropolitan Planning Organization. Improved safety and increase access for pedestrians was listed as a community concern identified through this planning process. (WVDOH, 2020) Downstream Strategies, LLC and Ltt Soil, LLC were engaged by owners of property slated to be impacted by the development of a roundabout at the intersection of Greenbag Road, Dorsey Avenue, and Kingwood Pike. In this report, we evaluate whether the EA appropriately considers: · the identification and loss of prime farmland (farmland of statewide importance), · stream and wetland impacts, and · all reasonable alternatives. (continued)
811	Continued from #810 2. LOSS OF PRIME FARMLAND (FARMLAND OF STATEWIDE IMPORTANCE) The following comments refer to the Mary E. Hastings Property, Parcel ID: 31-09-048A-0011-0000, located at the southwestern corner of the intersection of Greenbag Road and Kingwood Pike (the "Hastings property"). The property in question is within the limits of disturbance. The EA incorrectly leaves this property out of its assessment of prime farmland. While not acknowledged in 1 the EA,this property's soils actually classified as a soil of statewide importance for farmland. The Clarksburg soil series is known to be a productive agricultural soil, and the soil and land are utilized by Mary Hastings and others for agricultural crop production. The EA should be corrected regarding the classification of land use and designation for the Hastings property in the EA by: 1. Correcting all maps showing agricultural land for the Hastings property. 2. Correcting the analysis and calculations for the disturbance of the prime farmland (farmland of statewide importance) impacted by all alternatives for the Hastings property.

	3. Updating the following tables by accounting for the disturbance to the agricultural land on the Hastings property: Table E-2: Summary of Impacts from the Preferred Alternative (2 / C / F); Table 5: Summarizing the Effects Analysis from Alternative 1 and Alternative 2; Table 5: Impacts Analysis Table – Alternatives; Table 6: Impacts Analysis Table – Mississippi Street Intersection Options; Table 7: Impacts Analysis Table – Dorsey Avenue / Kingwood Pike Intersection Options; and Table 11: Summary of Impacts from the Preferred Alternative (2 / C / F). 4. Analyzing and identifying the socioeconomic effect from the loss of farming income from the effects of each alternative by a conversion of land use for the Hastings property. 5. Identifying the mitigation for both the loss of the prime farmland (farmland of statewide importance) and the loss of income from not being able to utilize this land for income as part of any decision for a preferred alternative. Table 7 refers to the NRCS Form CPA-106. If this form was utilized to categorize the Hastings property as nonproductive farmland, then this assessment is in question because it was not done in cooperation with the landowner or with the knowledge that current prosperous agricultural production is being conducted as the present-day land use. The West Virginia Department of Agriculture acknowledges as such through an active permit for hemp cultivation on this property. Completed forms for assessed properties are not included in the EA or referenced as part of the project record in any manner to show where they were applied and to which landowner. The EA must adequately display where this assessment was conducted so as to be able to show, as part of the analysis, which farmland was not deemed productive—just as the EA shows which farmland is productive by identifying the prime farmland not only in maps but also in the effects and in the comparison of alternatives. This full disclosure of the site-specific nature of the assessment would then be a transparent analysis and equally treat all landowners with regard to assessed land use for agricultural purposes. Nowhere in this EA does it disclose which segments of land underwent the process of evaluation using the NRCS Form CPA- 106 or who conducted this analysis. In addition to hemp cultivation, the Hastings property is also the site of Conscious Harvest Cooperative's flagship community garden—a space where community members can rent small or large garden plots to produce their own food. The Cooperative also supports an income-based, subsidized community-supported agriculture (CSA) program to connect individuals and families in need with local, healthy produce. Partner organizations join the cooperative to access healthy food vouchers for their staff and clients. This CSA program connects local farms and community agencies. (continued)
812	Please do not do this roundabout at the end of Kingwood Pike. Turning lanes would be the best solution. When the Pike is icy in winter it is going to cause major accidents, people will be sliding Into the roundabout. It is also taking precious land from businesses. Please consider this. Thank you
813	Continued from #811 Shareholders are then provided with CSA shares at an affordable, subsidized price that is dependent on income. In 2020, the group invested $9,555 back into the local food economy, purchased $6,480 worth of produce for local families, and provided approximately 2,000 pounds of

	produce to West Virginia families. The area used by Conscious Harvest Cooperative on the Hastings property is almost completely within the limits of disturbance of the preferred alternative. The value of this agricultural resource would be lost if the project moves forward as currently planned. The use of the land for the CSA provides additional support that this soil (CkC map unit – Clarksburg soil series) is currently being used for agricultural food production and indeed warrants classification of prime farmland (farmland of statewide importance) and the protection that goes along with this classification. 3. STREAM IMPACTS Construction will occur in the Aarons Creek and Cobun Creek watersheds. If the preferred alternative is chosen, there will be permanent impacts to these creeks—as well as streams within the proposed limits of disturbance. Road widening will likely force the relocation of streams, destroying existing habitat and severely disrupting aquatic organism populations and potentially species diversity. Road widening and construction of the roundabout will also increase the culverted length of streams in the project area. This will lead to the permanent loss of habitat for the length of the culverts. Depending on culvert length and design, the ability of aquatic organisms to pass up- and downstream of the project area will be limited or completely blocked. This will contribute to loss of upstream refugia from warming waters due to downstream runoff from further urban development, decline in potential spawning habitat in secondary tributaries, and potentially increased exposure to environmental contaminant runoff from roadways and urban settings in times of flooding and other storm events. Table 11 of the EA lists the lengths of streams impacted by the preferred alternative, but the types of impacts (complete loss, level of habitat degradation, change in streambank and stream substrate composition) are not described. The current condition of these waterways was assessed in the Wetland and Surface Water Delineation Report, included in the EA as Appendix B, but the EA did not include any predictions or describe the effects of the condition of these streams after construction. Without this information, is it impossible to determine the impacts to streams in the project area. Table 13 of the EA summarizes mitigation commitments for the preferred alternative. For impacted streams, construction and stormwater control best management practices are discussed, but no mention is made of mitigating for permanent loss of aquatic habitat or reduction in the quality of remaining habitat. Calculations should be made for the actual loss of stream and the riparian area impact, and these calculations should be accounted for in the analysis of each alternative. Road widening and construction of roundabouts with truck aprons will increase the area of impervious surfaces throughout the length of the project area. This, in turn, will increase the amount of stormwater runoff, as acknowledged on page 10 of the EA. Streams form in response to the amount of water that normally flows through them during storm events. Regularly increasing the volume of water to streams during storm events will cause changes to the shape and size of receiving streams, often leading to rapid erosion, destabilization of streambanks, and sediment deposition in aquatic habitats. The water quality will also be impacted due to changes in stream temperatures and changes in chemistry from pollutants in the surface runoff from the paved surfaces. These changes will impact both the quantity and quality of the water in streams downstream of the project area. (continued)
814	Continued from #813 For example, the stream running east from Jonathan Lane along Greenbag Road discharges into Aarons Creek at the eastern end of the project area. The EA notes that this stream will be expanded to accommodate increased runoff. This increased runoff will discharge into Aarons

	Creek. No mention is made of the possible impacts of this discharge on the stability of Aarons Creek—a stream which, according to Friends of Deckers Creek's multi-year watershed-wide monitoring program, is one of the cleanest and healthiest in the watershed. The EA must also include a stream assessment of Aarons Creek and a full indirect effects analysis done for each alternative to this stream system to assess stream stability, sediment and erosion, and aquatic habitat integrity. In summary, the EA does not adequately quantify or mitigate for impacts to Aarons Creek or Cobun Creek, streams outside the area of disturbance for the preferred alternative that will be impacted. 4. WETLAND IMPACTS 4.1 Interpretation of soil survey data In addition to the errors noted above regarding prime farmland designation, the EA also misrepresents the soil series mapped on the Hastings property in the Wetland and Surface Water Delineation Report, included in the EA as Appendix B. On page 239 of the PDF document for the EA, Table 1 identifies the Clarksburg soil series4 as a hydric soil as designated by the U.S. Department of Agriculture Natural Resource Conservation Service. This is incorrect. The Clarksburg soil series is moderately well drained and is also identified as farmland of statewide importance. Designation as both hydric soil and farmland of statewide importance are in direct conflict. The Web Soil Survey does not designate this soil series as hydric. This is an error in the analysis. This same error is also made for the Monongahela soil series. This error in the EA calls into question the validity and interpretation of the way in which the soil survey data is being used in this EA and the accuracy of the analysis. It seems that there is a lack of understanding about the design of soil map units and the minor soils that may be present within a map unit. Within the Clarksburg soil map unit, the Melvin soil series is identified as a minor soil component, and it is classified as hydric. Because this is not adequately explained or appropriately represented in the EA, the analysis is flawed and calls into question the wetland delineation analysis and soil determination. No transects or soils assessments were conducted on the Hastings property as displayed in the map for the Aquatic Resources Report. 4.2 Increased stormwater runoff Wetlands adjacent to the limits of disturbance will be impacted by increased stormwater runoff. Wetland 6 is described in the Wetland and Surface Water Delineation Report as an 80 percent forested wetland providing important wetland functions including sediment retention, nutrient removal, and groundwater recharge. This wetland is adjacent the proposed site of the Mississippi Street roundabout in the preferred alternative and, although it is currently shown as outside the area of disturbance, it is likely to see increased runoff from the widened road and possibly from the roundabout. Increased stormwater runoff could increase water levels and sediment and pollutant deposition, which may affect the hydrologic conditions of the wetland and cause a change in vegetation and function from its current state and ecological value. Wetlands 1 and 7 identified in the Wetland and Surface Water Delineation Report include forested and emergent wetland areas, which provide significant ecological services to the surrounding areas including groundwater recharge, sediment and stabilization, and nutrient removal. They are shown to be outside the area of disturbance for the preferred alternative; however, these wetlands receive runoff from three streams that will be impacted by construction. (continued)

815	I understand the increasing need for road construction and infrastructure, but I also believe with reasonable arguement that it could be implemented in a more sustainable manner with no affect to the surrounding active farmland. This proposed roundabout creates conflict between local government officials who are understandably trying to expand urban growth and landowners who are trying to preserve their cherished crops. Taking away from them with no where near the compensated amount to cover their net worth of goods is pure evil. I believe there are plenty of ways to compromise so both parties could benefit, the road may be built for better traffic flow and the landowners could keep their property as deemed to them.
816	Continued from #814 As discussed above, the EA does not clearly define these impacts, so it is difficult to know exactly what changes will occur. At a minimum, these wetlands will see increased runoff from the increased impervious surfaces nearby. Increased sediment and pollution levels are also possible, both during construction and afterwards. Wetlands 1 and 7 could also receive increased stormwater and pollutants directed from the increased impervious surfaces created by the widened road and roundabout. At a minimum these increases should be deemed as an adverse effect because they negatively change the ecological value and services that the wetlands perform within the watershed. These changes to wetland hydrologic conditions, increased deposition of sediment and pollution, and resulting stress on existing vegetation will negatively impact the valuable functions provided by wetlands just outside the area of disturbance defined in the EA. This would add to a cumulative effect of decreasing overall watershed health. These are not adequately quantified in the EA and no mitigation of these impacts considered. 5. REASONABLE ALTERNATIVES The EA considers three alternatives for the intersection of Greenbag Road with Dorsey Avenue and Kingwood Pike: Options D, E, and F. Another option should be analyzed and included in a revised EA that combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes, for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA. These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would: + improve the safety and access for motorized and non-motorized connections; + reduce impacts to natural resources; + preserve significantly more of the adjacent farmland of statewide importance; + reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands; + limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation; and + reduce construction costs. 6. RECOMMENDATIONS We recommend that WVDOH and FHWA issue a revised EA that addresses the concerns raised in this report: - Correct errors regarding the classification of land use and designation for the Hastings property, including updating all maps and tables that reference prime farmland (farmland of statewide importance), analyzing and identifying the socio-economic effect from the loss of farming

	income, and identifying the mitigation for both the loss of the prime farmland (farmland of statewide importance) and the loss of income. - Provide information on the post-construction conditions of streams in the project area to accurately quantify steam impacts and stream mitigation requirements. - Quantify and mitigate for impacts from increased stormwater discharge to Aarons Creek and Cobun Creek, which will be impacted even though they are outside the area of disturbance. · Revise the wetland delineation report to accurately describe soil types and expand field surveys to ensure that all wetland (hydric) soils are reviewed in the EA. - Quantify the impacts on wetlands adjacent to the project's limits of disturbance from changes to wetland hydrologic conditions, increased deposition of sediment and pollution, and resulting stress on existing vegetation. - Include and analyze a new option with dedicated left turn lanes for the Greenbag Road approaches and design features, but no added lanes, for Dorsey Avenue and Kingwood Pike. In addition, the EA includes multiple Appendix A's as well as Table 1's, making tracking in this document difficult and the references to each item possibly incorrect. In Table 5 under the description for impacts to floodplains, there is a reference to Table 2, but Table 2 deals with impacts to environmental justice concerns.
817	This is my 3rd comment Public safety is Primary concern. Lack of. Consideration for public Safety show in your. In your plan. Is not acceptable. The lack of Concern for people safety i HAS Not Addressed. Properly. I reviewed the plan. The proposed. Design for foot traffic is Ludicrous. I mention last year. That a life is more valuable than your profit margin. Among other safety concerns. 1. You have failed to address the Mountainview primary school. Currently mothers are dodging traffic to transverses a 4 foot culvert With child in hand .. 2.Lighting sidewalks. 3.Crosswalks guard rails are not addressed properly. Do you really feel that this proposal will fit the public needs both in cars and walking? Does the State of West Virginia put automobiles ahead of peoples safety and well being ? The first fatality should be considered on your head. And i certainly hope and pray this comment will be available to the attorneys involved. Furthermore, there's no consideration, 0, zero, None for any foot traffic from the kingwood pike crossing 857. North or south There. Are no proposed crosswalks. "Pedestrians have been Thrown under the bus" I among others will no longer. Be able walk to church. Which is less than one thousand Yards from my home. God. is watching
818	Please consider a safe bicycle lane for this project. This would allow access from White Park to Sabraton enabling more connectivity for the community.
819	Noooooooooo

820	I wonder if any of the powers that be have ever seen how roundabouts are used on the West Coast. I'm NO expert, but I never saw one at a major intersection of 2 major roads living there. Let alone one that is part of a schools entrance/exit. They were located on larger, yet moderately-traveled suburban neighborhood roads. It seems the complete opposite here and very dangerous for the amount of traffic on them
821	I first visited the beautiful farm in the proposed location for the roundabout in fall of 2020. I tasted the plums and tomatoes grown on the property by the family, and they were second to none. Using imminent domain to take a multi-generational family farm and active cbd business is a moral crime. Small parcel land owners, farmers, and small businesses should be protected, not trampled upon. Especially when their existence seeks to improve and benefit those around them.
822	Against proposed roundabout. Right turning lane instead.
823	This my fourth comment For the record im totally disabled.from a sub dural. Hematoma. Last april 16. At your program I spent 2 hours with DOH. Spoke person chad. Lowther. Why..You have not addressed my comments in your Report You must be a gambling man. You gambling 10. Million of taxpayer funds that the retaining wall will allow east bound traffic flow. I bet not This wall as i. ,Have Stated,. has been replaced 3 times since the construction. Of route. 857. . 1963 app it 2020 60 years 4 walls do the math Yet no consideration in your. Newly dated plans... i would say new plans However there are the same as last years I brought in a wv landslide map.remember. oh no you dont YOU SIR mr.Sykes didnt have 30 seconds for me You could wait to go home..you remember. Mr Lowther does. Again prudence requires. Hire a 3rd party geographic engineer. BE HIRED that understands what a lateral lines Represent and the relationship of proximity of these markings. Just as requested 16 april 2019. Over a year ago. YOU CLEARLY DO NOT KNOW HOW TO READ A LANDSLIDE MAP It wont just go away. Its clear you do not... Nor have my questions would been addressed from last year. History is a great teacher for those. Who take the time to review it. As you are aware of mr.Richards Comments and landslides Perhaps history will show That DOH had to make addition. Monetary compensation after the construction 857 to mr richards grandfather for loss of ability to operate his farm ..as well loss of his barn as it slid over the hill towards your cut. Another "gamble" .your willingly taken. with. My " public" taxpayer dollars. Look at history sirs The taxpayer demands that you not piss away our tax dollars. While counting your profit.
824	I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road.
825	The Environment Assessment states there is expected increase growth and development in the region. Why was the increase in traffic, noise, and air pollution associated with growth and development not described, considered, or analyzed as impacts in the Environmental Assessment?
826	Please, Please, Please DOH, build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
827	I'm a long time cyclist in morgantown and I routinely use my bicycle to transport my 5 year old daughter. my daughter's kindergarten is on greenbag road, but I am afraid to bike her there! Greenbag road has no shoulders or sidewalks and has frighteningly fast auto traffic. I would be

	able to visit businesses on greenbag with better infrastructure. At the present time, I do not visit those businesses because of the unfriendly infrastructure.
828	Bad idea for everyone need to fix the roads around it first before some one gets killed Aaron's creek isn't fit to drive on
829	Your proposed drainage plans for the Greenbag Rd project is not adequate....What are you attempting To do? FLood The CHURCH?
830	your ADA REPRESENTIVE is Aloof
831	I'd like to urge WVDOH to reject the plan to add roundabouts on the Greenbag Rd for the following reasons: (1) The plan to move truck traffic from downtown Morgantown to the Greenbag Rd is an outdated plan which will only result in degregation of this road, causing the need for addition highway funds to maintain it. Trucks should be required to use the Interstate instead. (2) With the Middle school nearby and recent increase in residential development in the area, the Greenbag-Dorsey intersection is now frequented by school buses and more parents transporting students. The addition of a roundabout, which encourages faster travel, creates a significant safety hazard for children and families. This would be even worse if truck traffic is being directed to this road. (3) There are several other roads within Morgantown where traffic is a much more significant issue that are in greater need of attention, e.g. Vanvoris Rd, University Ave, Beechurst, are much higher priorities, to name a few. (4) In general, roundabouts still confuse drivers. If upgrades to Greenbag Rd are made at all, turning lanes are a simpler, safer and likely less expensive alternative to adding roundabouts at Dorsey-Greenbag and Dorsey-Mississippi Aves. (5) Lastly, the cost and negative community reaction associated with acquiring land needed to build unwanted roundabouts is a taxpayer burden and insights local/neighborhood outrage. This is esp. true with land of historical significance and community service such as the Hastings farm provides. In summary, in a time where demand for organic farming and buying local are of increasing community interest, historical land preservation would be compromised, the safety of area children and families are at risk, and much better alternatives are on the table, it seems irresponsible for the state to spend significant tax payer money to build the unsafe and undesirable roundabouts being suggested for the Greenbag Rd. Thank you for considering these arguments and I am hopeful the the WVDOH will make the best decision for the residents of Morgantown and area taxpayers on this matter.
832	I appreciate and applaud everyone's hard work balancing the many interests on this project. It is a very important one for the future of the Morgantown region! As noted in the main page for this project: "Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." While I applaud the DOH's work to include pedestrian infrastructure and some bike accommodations on the western half of the project, to not connect hundreds of residents and multiple businesses on the east side of Mountainview is contrary to that statement, and I hope the DOH will strongly reconsider the design from the Dorsey intersection eastward. I'd like to respectfully submit these points for consideration in the design: 1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative

	5) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback as noted above. Thus, I strongly recommend (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a sidewalk or multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic (I've ridden that stretch with my 11 year old son, so we know). I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. I greatly appreciate the opportunity to comment on a project that will have a major impact on our area for decades. Many of us have been working for improvements throughout the entire region for pedestrians and bicyclists, and this corridor is a critical piece of the puzzle. Thank you!
833	The roundabout on the Mileground didn't improve things, same with this one
834	Attention: RJ Scites, WVDOT, US Army Corps of Engineers, and all parties involved: This notice pertains to the "Greenbag Road Improvement Project" U331-857-0.67 /STP-0857(019)D The Concerned Parties and Interested parties, as listed below, all have interest within the boundaries of disturbance and have grievances with option D, E, and F as proposed in the Environmental Assessment (EA) for this project. The Concerned Parties and Interested Parties, as listed below, wish to resolve and offerer alternatives. The Concerned Parties and Interested Parties, as listed below, formally request consideration, reconsideration, and analysis of an additional alternative option: The option preferred by ALL PARTIES, as listed below, combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA.

	These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would: Improve the safety and access for motorized and non-motorized connections; Reduce impacts to natural resources; Preserve significantly more of the adjacent farmland of statewide importance; Reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands; Limit disturbance to unsuitable soils with a history of slips to prevent likelihood of property damage or loss; Limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation; Reduce construction costs. The Concerned Parties and Interested Parties, as listed below, refer to this proposed option as “Option G”. The Concerned Parties and Interested Parties, as listed below, unanimously support this “Option G ‘ as “preferred” The Concerned Parties and Interested Parties, as listed below, reserve the right to challenge the EA if this project continues as proposed without additional consideration, reconsideration, and analysis for this alternative “Option G”. The Concerned Parties and Interested Parties, as listed below, reserve the right to seek damages and/or remedy if this project continues as proposed without additional consideration, reconsideration, and analysis for this alternative “Option G”. Concerned Parties: Garret Richards, Landowner at the intersection of Greenbag Road / Kingwood Pike Thomas Richards, Landowner at the intersection of Greenbag Road / Kingwood Pike Mary Hastings, Landowner at the intersection of Greenbag Road / Kingwood Pike Dewey Hastings, Landowner at the intersection of Greenbag Road / Kingwood Pike Andy Pickering, Landowner at the intersection of Dorsey Avenue / Kingwood Pike Grant Hastings, Landowner on Dorsey Avenue Twin Creek Farms, DBA - Business, intersection of Greenbag Road / Kingwood Pike Owner: Thomas Richards Conscious Harvest Cooperative, 501(c)(3) - Business, intersection of Greenbag Road / Kingwood Pike Jennifer Hastings, Secretary / Ted Hastings, Founding Member Joy and Hemp Universal, LLC - Business, intersection of Greenbag Road / Kingwood Pike Owners: Mary Hastings / Jennifer Hastings / Ted Hastings / Patrick Kyle

	Mocking Bird Hill Farm - Business, intersection of Greenbag Road / Kingwood Pike Owners: Marlin Dehoff and Neha Lala Tong Thai Fresh, LLC - Business, intersection of Greenbag Road / Kingwood Pike Owner: Shawn Komondor Christopher Lazzell - Leasee, intersection of Greenbag Road / Kingwood Pike Shawn Komondor - Leasee, intersection of Greenbag Road / Kingwood Pike Neha Lala - Leasee, intersection of Greenbag Road / Kingwood Pike Marlin Dehoff - Leasee, intersection of Greenbag Road / Kingwood Pike Brandon Zilkanich - Leasee, intersection of Greenbag Road / Kingwood Pike Richard Ryan - Leasee, intersection of Greenbag Road / Kingwood Pike Ted Hastings - Leasee, intersection of Greenbag Road / Kingwood Pike Interested Parties: Ted Hastings, Heir to land at the intersection of Greenbag Road / Kingwood Pike Jennifer Hastings, Heir to land at the intersection of Greenbag Road / Kingwood Pike Patrick Kyle, Heir to land at the intersection of Greenbag Road / Kingwood Pike
835	Attention: RJ Scites, WVDOT, US Army Corps of Engineers, and all parties involved: NOTICE: Environmental Assessment for the Greenbag Road Improvement Project I am writing, at the earliest opportunity, to inform the Federal Highways Administration, US Army Corps of Engineers, and West Virginia Department of Transportation of my business located within the area of disturbance of the proposed Greenbag Road Improvement Project. Please accept these comments and this evidence as part of the formal federal process of NEPA and the period allowing for official public comment. In addition to providing this information to the agencies (federal and state) as comment, I am also providing you this information to be considered as newly discovered information given that the information provided in this letter is providing evidence to correct flaws in the existing condition as described by the project in the Environmental Assessment (EA). Joy And Hemp Universal LLC, a woman-owned small business, a WVDA licensed hemp farm, and regional agriculture resource, is located at the southwestern corner of the intersection of Dorsey Ave and Kingwood Pike, Parcel ID: 31-09-048A-0011-0000, 09-48A-001000000000. And 08 10005400100000. The acreage is 2.7810 AC SUR, 1.752 AC SUR, 2.295 AC SUR, respectively. The entire acreage, 6.828 acres, of our farmland would be impacted directly and indirectly by the preferred alternative for the intersection design, “Option F”, resulting in irreversible and irretrievable commitment of resources which equates to a loss of natural resources, loss of historical and cultural resources, loss of prime farmland, loss of economic revenue, and loss of my property which would be taken from me involuntary. The EA is intended to provide opportunity to describe and evaluate the impacts to social, cultural, natural, economic, and environmental resource factors. In our case, it has done none of the above because the EA failed to identify the property as agricultural land with prime

	farmland (farmland of statewide importance), the economic value that this land generates through agricultural production, the loss of historical and cultural value which is known by the landowner (myself) but not properly surveyed, impacts to hydrologic and watershed effects to receiving streams from disturbance, effects on the local food system including loss existing food sources, and displacement of a woman-owned small business. The EA incorrectly assesses the classification of land use and lacks the proper designation for the soil resource as prime farmland (farmland of statewide importance) where our business, Joy And Hemp Universal LLC is located The EA is does not properly identify the soil map unit where the property is located at as soil of statewide importance for farmland. The Clarksburg soil series is known to be a productive agricultural soil. The soil and land are utilized by Joy And Hemp for agricultural crop production. The EA should be corrected regarding the classification of land use and designation for this property. Table 7 refers to the NRCS Form CPA-106. If this form was utilized to categorize the property as nonproductive farmland, then this assessment is in question because it was not done in cooperation with the landowner or with the knowledge that current prosperous agricultural production is being conducted as the present-day land use. The West Virginia Department of Agriculture acknowledges as such through an active permit for hemp cultivation on this property.
836	Continued from #835 Completed forms for assessed properties are not included in the EA or referenced as part of the project record in any manner to show where they were applied and to which landowner. The EA must adequately display where this assessment was conducted so as to be able to show, as part of the analysis, which farmland was not deemed productive—just as the EA shows which farmland is productive by identifying the prime farmland not only in maps but also in the effects and in the comparison of alternatives. This project, as currently designed, will destroy100+ years of soil production via natural amendments and labor. Our business is built on the story and integrity of our soil. The soil has been maintained for 5 generations by the same family with the same sustainable agriculture practices. This is an important branding tool for our business. No pesticides or herbicides have touched that land while our family stewarded the land. Joy and Hemp markets our products as grown by a multi-generational family, and this is a powerful branding tool. This value is passed onto our customers as rare in today's modern business world. The loss to our customers and our business. Loss of this branding tool would be significant and our business will seek damages and/or mitigation. This full disclosure of the site-specific nature of the assessment would then be a transparent analysis and equally treat all landowners with regard to assessed land use for agricultural purposes. Nowhere in this EA does it disclose which segments of land underwent the process of evaluation using the NRCS Form CPA- 106 or who conducted this analysis. Disregard for the correct land use and soil information regarding this property in the EA (and corresponding tables and descriptions) has resulted in omissions for direct, indirect, and cumulative effects for prime farmland, disturbance acreage, water quality, heritage and cultural resources. We assert that inadequate data was made available to government agencies by the hired contractor identified in the EA for decision-making. The EA must be corrected to include the economic, socio-economical, environmental, and farmland impacts due to the loss of the productive

	agriculture business and loss of soil of Statewide Importance if the preferred alternative were to be selected. This same information and analysis should also be done for all alternatives to provide an accurate comparison of alternatives and the tradeoff for each alternative considered and analyzed in detail. Due to COVID-19 and the restriction and limitations (as direction provided by the U.S. Government through the CDC and the State of West Virginia through the Health Department) this pandemic has brought upon the country, changes in daily operations of all businesses across the country, the 2020 federal election, and other pressing matters during this public comment period; National, State, and local environmentalist groups, farming organizations, food security advocacy organizations, and conservation agencies are just becoming aware of the impacts of the proposed alternative and the marauding of Federal and State Transportation Agencies. Therefore, as with many activities across the country, an extension of the comment period and opportunity to provide new information and findings by the public must be granted to allow for participation in a safe manner. Within the alternatives, the Government should be prepared to identify the economic effects from the loss of farming income and other effects by a conversion of prime farmland. The analysis must also identify mitigations for both the loss of the prime farmland (farmland of statewide importance) and losses and damages incurred to our business, current economic revenue and projected revenue based on the business plan and future operations.
837	Continued from #836 Since beginning farming in 2018, Joy And Hemp Universal LLC has made substantial investment into start up at property located at the intersection of Dorsey Ave and Kingwood Pike, Parcel ID: 31-09-048A-0011-0000, 09-48A-001000000000, and 08 10005400100000. This would need to be reconciled. We are prepared to provide evidence of this investment and help the EA correctly identify those direct losses from each analyzed alternative. Given the sensitivity of personal financial information and proprietary claims for the value of the losses, we will not be providing this information as part of this letter but rather through a formal submission of confidential information to the agencies. No surrounding areas within the 6.828 acres affected would remain farmable for hemp cultivation due to the photo responsive nature of the hemp flower. The crop would be affected by light pollution from the artificial lighting needed in the preferred alternative. The plants are extremely valuable in today's market compared to other commodity crops, and substantial losses to our business would be incurred with the implementation of the preferred alternative. Further, our business may incur unforeseen losses due to this intersection design. Part of Joy And Hemp Universal LLC's mission is to help other farmers in West Virginia. As a result of the construction of the preferred alternative, the educational programs that occur on this location would be destroyed. Those programs are supported by a number of local hemp farms, and other farmers, and WVU research students. This social impact was not identified in the EA and the loss was not accounted for in the effects analysis. Loss of this space for such programs would cause damage to our business and others and must be remedied or mitigated if the project were to continue as described by the EA.

838	We need a green turning arrow on the light. The roads aren't safe. Why would you waste 15 million dollars when the pot holes are destroying are cars. Fix the roads with the money!!!!
839	Please note that the positions outlined in this correspondence supersede the Coalition's position expressed in correspondence sent via US mail. The Greenbag Road Improvement Project offers a timely opportunity to build infrastructure that will facilitate safe travel by pedestrians and cyclists while connecting neighborhoods to city parks, schools, and local businesses. The WV DOH website public input page notes, "This Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor (emphasis added)….Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." To ensure that the Project meets community needs identified in the MMMPO plan, the Mon Valley Green Space Coalition respectfully requests the following modifications to the DOH Greenbag Rd Improvement plan: • Instead of sidewalks, a multi-user asphalt side path should be built on the N. side of Greenbag Rd along the entire length of the project area. This will facilitate use by both cyclists and pedestrians while offering a safety barrier between users and vehicular traffic. • This multi-user side path should extend to the current signalized intersection of Greenbag Rd and the Mountaineer Mall. • The project should be amended to include a marked pedestrian crossing from the north side to the south side of Greenbag Rd. A designated, safe crossing of Greenbag Rd. will serve residents from low-income neighborhoods who travel on foot and by bicycle to reach the grocery store. Such a crossing will also serve the community by facilitating the connection of two key recreational areas—White Park and Dorsey's Knob Park. A HAWK beacon (High-Intensity Activated crosswalk) at the current western terminus of the project would serve pedestrians and cyclists without disrupting traffic flow because it is inactive unless activated by a pedestrian or cyclist. In addition, as outlined in the October 22, 2020 "Review of Environmental Assessment" prepared by Downstream Strategies and Ltt Soil, there are significant, negative environmental impacts of a roundabout at the intersection of Greenbag Rd., Kingwood Pike, and Dorsey Ave. These include: (1) the loss of prime farmland—farmland that currently serves as a community garden; (2) relocation of streams resulting in destruction and the permanent loss of wildlife habitat; (3) and, disturbance of wetlands due to increased stormwater runoff. For these reasons, the Mon Valley Green Space Coalition respectfully requests that an alternative to the proposed roundabout at Greenbag Rd./Dorsey Ave/ Kingwood Pike be adopted.

840	A round about doesn't seem necessary at the intersection of Greenbag Road and Kingwood Pike. A turning lane should be sufficient. Not to mention the streams that natural buffers that will be severely negativity impacted with this project. I live close to the intersection and commute it often, a roundabout seems like over engineering of an intersection. To be fiscally and environmentally responsible please reconsidered the option to improve this intersection.
841	I am a resident of South Park who frequents Greenbag Rd en route to Giant Eagle for grocery shopping. I am often worried for people walking and biking along the road with so much traffic and no shoulder - especially in the winter. I encourage DOH to build a place for people of all ages to safely walk and bike on the entire length of Greenbag Road so people can safely access the schools, parks, and shopping areas along that stretch of road on foot or by bike.
842	I appreciate and applaud everyone's hard work balancing the many interests on this project. It is a very important one for the future of the Morgantown region! As noted in the main page for this project: "Community involvement in the development of the Morgantown Monongalia Planning Association (MMMPO) Greenbag Road Corridor Study (2015) identified pedestrian facilities to connect the neighborhood schools with the commercial and residential areas as a key issue for community safety and access." While I applaud the DOH's work to include pedestrian infrastructure and some bike accommodations on the western half of the project, to not connect hundreds of residents and multiple businesses on the east side of Mountainview is contrary to that statement, and I hope the DOH will strongly reconsider the design from the Dorsey intersection eastward. I'd like to respectfully submit these points for consideration in the design: 1) sidewalk the entire length of the project on the north side of Greenbag is a good option for pedestrians, though a multi-use path would be much safer and encouraging for the average pedestrian or bicyclist 2) I fully support the sidewalk as designed on the east side of Dorsey, connecting Greenbag to Luckey Lane and Mountainview ES 3) I fully support the sidewalk on Luckey Lane, but would like it to extend the entire length of Luckey Lane 4) I fully support the roundabouts as designed. I hate to see the loss of land for the community farm but understand why that is the chosen alternative 5) <<From Dorsey intersection to the east>>: the lack of ped/bike infrastructure on this section of the project is a major concern and contrary to public feedback as noted above. Thus, I strongly recommend (a) a 5' sidewalk on the north side of Greenbag + paved shoulders or bike lanes on both sides, or (b) preferably, a 10-12' multiuse path on the north side of Greenbag from the Dorsey intersection to the eastern terminus of the project to connect the schools to hundreds of residents in the housing developments that are accessed from Jonathon Lane, Ashworth Lane, and Long Branch Drive. ---Alternatively, if the Luckey Lane to Dorsey Ave section is absolutely impossible for ped/bike infrastructure along Greenbag, at a minimum a sidewalk or multiuse path is requested from the Luckey Lane intersection w/Greenbag to the eastern terminus of the project 6) <<From Dorsey intersection to the west>>: I appreciate the bicycle accommodations (3-4' shoulders), but those will be very uncomfortable for the average bicycle rider because of the proximity to high speed and volume of traffic (I've ridden that stretch with my 11 year old son, so we know). I'd ask that an alternative be considered that could support both pedestrians and bicycle riders ---> a 10-12' multi-use path, separated from the road (rather than the ~12' of paved shoulders & sidewalk that are currently proposed from the Dorsey intersection, westward) 7) <<From Dorsey intersection to the west>>: I strongly recommend a safe pedestrian crossing from the western terminus of the sidewalk on the north side of Greenbag (near the Goodyear Auto building) to the south side of Greenbag (Giant Eagle/mall) - a HAWK signal is a good

	recommendation. This could serve significant community interest in connecting White Park by trail to Dorsey's Knob park & trails. To summarize, pedestrians and bicyclists of all ages and skill levels should be supported along this <entire project corridor>, ideally with a 10-12' multi-use path separated from traffic on the north side of Greenbag, alternatively by using a sidewalk and two paved shoulders. I greatly appreciate the opportunity to comment on a project that will have a major impact on our area for decades. Many of us have been working for improvements throughout the entire region for pedestrians and bicyclists, and this corridor is a critical piece of the puzzle. Thank you!
843	From a local perspective of someone who actually drives on these roads every day: The two roundabouts on WV 273 in Fairmont work well because they have multiple lanes and bypass lanes and conversely, the Mileground road roundabout doesnt work well because it doesn't. Traffic still gets backed up there, and I see the same thing happening with the proposed roundabout on Greenbag road for the same reasons. You would be better off with the proposed option of adding turning lanes and looking at changing the sequencing of the light changes so that each green light lasts longer and more traffic flows through at each change (it seems to me that most of the efficiency is lost when traffic starts and stops) Please, do not build another roundabout in Morgantown that nobody here wants or asked for, especially at the intersection of Kingwood Pike and Greenbag Road. Please fix the failed roundabout on the Mileground if you want to work on a roundabout in Morgantown. Also, from the perspective of someone who helps manage a local group with hundreds of area runners/joggers/walkers/hikers.. with the expanded trails at White Park south of the reservoir coming up, Morgantown has a tremendous opportunity to connect trails at White Park with the Trails at Dorsey Knob Park. It would mean so, so much to pedestrian safety if the DOH could install an on demand crosswalk/traffic signal (AKA HAWK beacon) to cross Greenbag Road by Giant Eagle. I have heard of and even personally known too many people who have been hit by cars around town, and coming from someone who knows the area trails as much as anyone, more and more people will want to go from the new trails at White Park to the trails at Dorseys Knob Park in the future. It is actually one of my favorite loops in town to run. It would mean so, so much to the safety of pedestrians crossing Greenbag Road if we could get an on-demand stoplight/crosswalk at this intersection of Greenbag Road. I implore you, please use the installation of sidewalk along Greenbag Road as an opportunity to save lives and install a HAWK beacon /crosswalk across Greenbag Road by Giant Eagle. I guarantee it will save lives if you do it and earn whatever it costs to install several times over. Thank you so much for your consideration.
844	Mr. Ted Hastings lets us dispose leaves on his property that we vacuum off the city streets , he uses the leaves for compost material for his garden. We get the leaves off the street and he gets fertilizing material for his garden. A win for both parties. A roundabout would take most of his gardening space. In my opinion only , I think the state could put in turning lanes and add green arrow signals to allow for smooth traffic flow. Thanks Harry w. Dalton #~city of Morgantown street department superintendent Cell-304-216-8654
845	The Greenbag Road Improvement Project would affect my ability to keep my pantry stocked with nutritive foods and teas. I have an agreement with the owner of the farm at the Dorsey Avenue intersection to sustainably harvest mullein, chicory, dandelion, and many other plants. Option F would be a serious detriment to this. Having to purchase these goods would cost me hundreds of dollars a year. I would like to ask you to consider less invasive options such as turning lanes at this intersection.
846	This is Part 1 of 2 of a continuous comment:

	I am a 33-year-old resident of Morgantown and I have worked for the past two years as the Staff Engineer for the City of Morgantown. I received my B.S. in Civil Engineering from WVU in 2017 and will finish a M.S. in Transportation Engineering in 2021. My research is focused in highway safety, public input and decision-making processes, and nonmotorized transportation data. I first came to Morgantown in 2014. In the time since, I served as chair of the Municipal Bicycle Board for more than 3 years and have actively participated as a member and leader of nearly a dozen other community-based groups and organizations. I was a host and organizer of the 2017 West Virginia Bike Summit and I have participated as a stakeholder, steering committee member, and/or decision maker in the various recent transportation plans and highway safety summits that concern Greater Morgantown. In my current role as Staff Engineer, I am the city's staff representative to the Pedestrian Safety and Municipal Bicycle Boards, as well as the Traffic Commission. My job duties are diverse – I perform traditional engineering work like permit review, designing transportation infrastructure, and modernizing the city's standard details. I manage and inspect roadway construction projects. I help prioritize investments by working with our boards and commissions, and I regularly perform roadway safety audits and transportation studies both reactive to citizen requests and proactive based on things like crash data analysis. Firstly, with a few recommended changes noted below, I strongly support the selected options. The roundabouts are appropriate for these intersections. Although the environmental assessment and justifications chose to focus on the congestion reduction qualities of roundabouts, I believe an equally (if not more) compelling reason is centered around the injurious and fatal crash reductions inherent in roundabouts versus traditional 4-way intersection designs. The existing intersections and alternative options allow for serious crashes to occur from all angles. Due in part to its arterial nature, Greenbag Road experiences high rates of speeding along its entire length, increasing the potential for serious, injurious, and fatal crashes. Morgantown has demonstrated a consistent desire to incorporate complete streets designs. The community has repeatedly asked for safety to be considered at least on par with congestion reduction when designing transportation infrastructure. Decision makers have stated goals for increases in nonmotorized mode share and crash rate reduction. Designs for infrastructure in this area should begin with an assumption that they must accommodate all of these users in explicit ways with dedicated infrastructure. The recent injury and fatality reporting for Mon County shows that we are not meeting our performance measures for nonmotorized injury and fatality reductions. Designs should understand that safety of these users is paramount. It should not consider these users after-the-fact. ~continued~
847	While I applaud the desire to improve the Greenbag Road corridor, it's crucial that ped-bike safety be considered more than is shown in the current plan. Please provide for a shared use path along entire length of proposed road improvements, in keeping with whole complete streets initiatives for WV. With all that right of way to work with, why is the sidewalk right next the road? Pull the same sidewalk (at minimal cost) away from the drive lanes and create a separate shared bike-ped lane, 8-10 feet, asphalt - not a 4-ft concrete sidewalk that no one wants to use. with the school and park nearby, and heavy traffic on greenbag, to put cars immediately next to peds on a busy arterial is not an adequate solution.

	Having walked a child to school along the Collins Ferry Sidewalk for years, I can tell you from first hand experience that a 4-ft sidewalk next to a busy arterial road will NOT be a comfortable experience. The width of the grassy shoulder at NETL between the travel lane and sidewalk - c. 15' wide - makes a world of difference. The desire for a ped connection between White Park and Dorsey's Knob is strong, and follows historic precedent- check the WVU archival images, and you'll see many references to hiking from White Park area to the top of Dorseys. Restore this ped - bike connection with a tunnel under at Cobun Creek; or at least plan the roadway such that a tunnel is easy to add later, when budget allows. With recent investment and interest in outdoor recreation, it's SO important not to leave our parks isolated from each other by major roads, and much easier to make allowances now for a tunnel than try to add one from scratch later. A broader bridge for Cobun Creek to allow peds + creek (at least when water's low) will do nicely. I hope you will give more attention to ped and bike safety on this important roadway project. I've been a bike commuter exclusively for 17 years, and I can say that biking along a narrow sidewalk next to a busy highway is NOT something I want to do unless I really have to. Here, you don't have to. Don't put school kids and park visitors and low income families walking to the grocery next to a highway, give them a separate path. Imagine how you would feel walking your kids next to a truck travel lane. I've walked that corridor now, and it's not comfortable.
848	As a teacher at Mountainview Elementary off Greenbag today, I can not understand the need for a roundabout. I travel this road daily and rarely see buildup. This is unneeded road construction, especially when our current roads are not maintained.
849	Continued from #846 This is part 2/2 of a continuous comment. In the spirit of ensuring that transportation designs around Morgantown help further Morgantown's motorized and nonmotorized transportation goals, I recommend this project consider the following design changes: 1) To reduce speeding, lane widths should always be kept to a minimum. This improvement currently calls for 12'-13' lanes – unnecessary for any design vehicle on a 35mph road. Reducing lane width to 10' or 10.5' would save significant financial resources and would help the road more properly communicate the desired 85th percentile speed. It would reduce crash severity for all transportation users. Recent District 4 improvements have defaulted to this more conservative lane width ideology; Greenbag should follow suit. 2) Longstanding community greenway plans have called for dedicated nonmotorized infrastructure along this underserved corridor. Although I am pleased to see more sidewalks included in recent DOH plans, I do not think that a sidewalk along this route (particularly if it includes a mountable curb) would be the appropriate treatment. The recent 2019 MMMPO Bicycle and Pedestrian Regional plan reiterated the previous plans and called for a shared-use path along the north side of Greenbag Road. I concur with this analysis and request that the designers seriously consider a separated shared-use path as a logical, likely cheaper, more accessible to various modes, and significantly safer option to accommodate cyclists and pedestrians along this route. This would require roadway crossings further up onto Dorsey and Mississippi – both sorely needed due to nearby schools, dense populations, and points of interest. It would reduce the awkwardness of pedestrian crossings which is a known difficulty with roundabout design. It would honor the significant resources placed into recent plans by the WVDOH, FHWA,

	MMMPO, local municipalities, and citizens. Such a sidepath would be easy to incorporate as it is, and made even easier by reducing the shoulder and lane widths. This sidepath should extend the length of the project. 3) If a sidepath is not possible from Mississippi up the hill to the mall and designers deem a sidewalk more appropriate, then a bicycle climbing lane should be included in that section. With recently announced resources pouring into recreational and trail development in this area, the presence of cyclists will increase dramatically in the next 2-3 years. 4) A sidewalk and sharrows should be included along the entire length of Luckey Lane to accommodate a natural desire path. 5) Comments undoubtedly left by others have likely called for connections across Greenbag to the Mountaineer Mall. These connections will absolutely need to be made at some point in the near future – if the WVDOH cannot fully incorporate them into the current plan due to lack of formal infrastructure on both sides, it would be an extremely appreciated gesture to ensure that what is built would not preclude, but rather facilitate their future construction. 6) Strongly consider working with property owners along Greenbag to reduce access points and curb cuts, particularly on the north side of the road near the Mall.
850	What are the impacts of the light pollution created by the options?
851	The Monongahela Group of the WV Chapter of the Sierra Club opposes placing a roundabout at the intersection of Green Bag Road and Kingwood Pike. The Hastings family generously provides a portion of their land to the Conscious Harvest Cooperative. The family has expressed concerns that it will no longer be able to support a community garden if a portion of the farmland is utilized for the roundabout. The mission of Conscious Harvest Cooperative is to create a hunger free future for WEst Virginia by facilitating food system change. It has multiple community partners, including but not limited to, the Morgantown Seed Preservation Library, Farm to Families, The Shack NEighborhood House, Mountain Harvest Farm, Round Right Farms, Firsthand Cooperative, WVU Food Justice Lab, WVU Community Food Systems Lab and Milan Puskar HealthRite Friendship House. Teh majority of these partnering cooperative farmers also provide assistance to teh local low-income population. In addition to the promoting physical health to disadvantaged populations, Community Partners also serve those expeirence homlessness, mental illness and those in recovery from addiction. During the pandemic disadvantaged populations that utilize support from Friendship House have not had access to this serivce aside from outdoor programs such as those facilitated at Conscious Harvest Cooperative. The WV-DOH conclusion that "No productive farmland is impacted" at this site is incorrect. The USDA soil survey clearly identifies these soils as "Farmland of Statewide Importance". The Environmental Assessment clearly illustrates the Conscious Harvest Gardens at this intersection in the various aerial photos, yet Figure 12 does not include them as Farmland. Please reconsider using this property as a site for a roundabout as it provides a livelihood for farmers, resources for disadvantaged populations and research for a more sustainable future. It is a valuable resource to the Morgantown Community.
852	This roundabout is a big waste of money. Just add some turning lanes at Green Bag and Dorsey Ave, and add some left turn lights at the current traffic signal. The roundabout is a dangerous and accident waiting to happen.
853	Details in the Environmental Assessment (EA) about our nonprofit business, Conscious Harvest Cooperative, are not adequate and require redress. The EA states,"Impacts to the community garden have been minimized to the extent practicable." This may misrepresent the scope of the project. The area used by Conscious Harvest Cooperative is almost completely within the limits of disturbance. The value of this community, cultural, and agricultural resource would be destroyed if the project moves forward as currently designed. The design and build portions of the

	project around the waterways and tree-line are concerning will effect our business and may be significant. We have grievance with the fact that our entire 501(c)(3) nonprofit designation will be at risk if the proposed roundabout (Option F) is chosen. Conscious Harvest Cooperative formally request an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to address the inadequacies and omissions in the EA. The land Conscious Harvest Cooperative is located on has a soil type of Statewide Importance for Prime Farmland. It is listed within the USDA registry as Prime soil type and is of protected designations. Conscious Harvest Cooperative formally requests a Land Evaluation and Site Assessment (LESA) as protected by Federal Law. This process of LESA was not afforded to our business, this is a violation of the National Environmental Protection Act (NEPA). Let this letter serve as notice that our organization intends for remedy. Conscious Harvest Cooperative formally requests an Environmental Impact Statement (EIS) be fully prepared to the best of the State and Federal Governments' ability to to acknowledge that our business is adequately represented and the impacts to the soil, community, and business are correctly assessed, as required by State and Federal Law. The funding for our Farm to Families Program, in part, comes from renting community garden spaces, as well as, fundraised and donated monies. This cornerstone program is an income based subsidized Community Supported Agriculture (CSA) program that connects individuals and families with fresh local produce. Partner organizations join our Cooperative to access healthy food vouchers. This CSA program connects local farm and community agencies. Shareholders are then provided with CSA shares at a subsidized price. The community garden is the backbone of our outreach programs. By renting community garden spaces, we generate significant income to fund such projects. The loss of these community garden spaces would severely damage our nonprofit. In 2020 the Cooperative invested an estimated $9,555 back into the local food economy, purchased an estimated $6480 of produce for families, and provided an estimated 2000lbs. of produce to West Virginia families, these figures are annual and exponentially growing. Loss and/or damages to this program and other similar programs is significant and will require remedy and/or mitigation. The Farm to Families Program provides qualifying families access to fresh local produce. We directly procure from local farms such as Mountain Harvest Farm. The food is delivered to locations such as The Shack Neighborhood House in Osage, WV. The food is distributed to qualifying families. Without our cost-share program, these families may not otherwise have access to fresh, local produce. This is a significant impact to these families involved, as well as a significant impact to Mountain Harvest Farm, and our nonprofit business. It may be determined that remedy is necessary for all concerned parties and/or mitigation. (Continued)
854	Continued from #853 Nonprofits would be affected as well, such as the Friendship House. The Friendship House rents a garden plot for their program that allows for a space for recovering addicts to go into nature with members of a treatment group to find relief. This program was featured on ABC News Pittsburgh. The loss of these types of programs would be significant to the recovery community, the Friendship House, and Conscious Harvest Cooperative and would need to be redressed and/or mitigated.

	Local businesses would be affected such as Mountain State Brewing Co., this business relies on our organization to dispose of wood ash from their wood fired ovens. This ash is not accepted as municipal waste and is not allowed to be dumped at their location by the river as noted by the Monongalia County Health Department. Our organization saves this business time and money by remediating this waste into a usable agricultural amendment product. Loss to businesses like Mountain State Brewing Co. and Conscious Harvest Cooperative would be significant and remedy required and/or mitigated. Fundraising is a large part of our nonprofit business. Though the garden itself is within a portion of the land for our farming and gardening activities, the land as a whole serves as an area for fundraising. Access to this land for music venues, cookouts, and other events is significant and loss of such land access would impact Conscious Harvest and damages may need to be awarded for such disturbances to our business. Conscious Harvest has significantly improved the land in whole, and has used donated monies and earned monies for the gravel in the parking lot. Volunteer labor has maintained the driveway entrance and road access. These donated and earned monies and donated labor will need to be assessed, reimbursed, and remedied while considering the donated labor of the trucking company who delivered the gravel including: fuel usage, wear and tear of equipment, and time to spread the gravel and/or mitigation. Perennial plants bought from monies donated and earned as part of a beautification project are significant and would need to be reimbursed and/or mitigated. These plants include, but are not limited to: beautiful, hearty fig trees that require years of growth before fruiting. The fence around the garden was built with donated and earned money and will lose integrity if moved. This fence would require a substantial amount of labor and possibly large equipment/trucks to move properly. The labor and equipment rental must be remedied and our business reimbursed for damages incurred and/or mitigation. Moving the fence will require storage for an amount of time to be designated as we look for another location. Storage fees for the fence will need to be established and the finances reimbursed and/or mitigated to the maximum extent of the law. Reconstruction of the fence will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. The pole barn located along the tree-line was built with a substantial amount of donated and earned monies and volunteer labor. Loss to this structure will be devastating as it will not be able to be moved. This structure is important to our business because it allows for shelter of our clients during inclement weather and also serves purpose during fundraising events. Mitigation and/or reimbursement of monies and labor must be remedied. Reconstruction of the pole barn will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation.

	(Continued)
855	Continued from #854 The tool shed along the tree-line contains donated and purchased tools. Loss of the shed will be significant. The tool shed was built with volunteer time as well as with donated and earned monies for materials. There is an appreciable mural painted on the shed by volunteers and local artists with paint procured by our nonprofit, damages will be significant and mitigation and/or reimbursement will be necessary. Reconstruction of the tool shed will be labor intensive and also may require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. A temporary storage space, in place of the tool shed, for all the tools will be needed. Tools will require storage for an amount of time to be designated as we look for another location. Storage fees for the tools and maintenance of the tools in storage will need to be established and the finances reimbursed and/or mitigated to the maximum extent of the law. The tilling and maintaining of the individual garden beds is significant. Some members have worked their individual plots for years, even before the 501(c)(3) destination was awarded. The fact that they can continually garden in the same location is important to the integrity of the crop, the soil, and our project. Mitigation and/or reimbursement may be necessary as remedy for the hours of labor and materials put into these garden beds. Creation of new garden beds will be labor intensive and also will require large trucks/equipment and new materials. This should be considered in regards to financial remedy and reimbursement and/or mitigation. The ability for our clients to have access to soil of this type, to grow food varieties of their choice, with whatever techniques they choose is significant. The service we provide gives our clients access to local food and creates sustainable food security. This is very important, especially during a pandemic, COVID regulations, restricted store hours, and limited food product availability. The loss to each individual member of our garden may be significant and require remedy to their persons and/or mitigation. Reacquiring land of this soil type, with access to parking, room for a pole ban and tool shed, with consideration to proximity of a metropolitan area, would be burdensome and challenging. The damages to our nonprofit would be significant if this project continues as planned. Access to this land may be irreplaceable. Mitigation and/or remedy may be necessary. Let it be known that standing EA has not allowed for adequate time to assess the full impact to Conscious Harvest Cooperative 501(c)(3). The standing EA appears to have inadequacies and omissions pertaining to the soil type at our location. Exact amounts and values for remedy are to be determined, the burden is ongoing. The design and build phase is concerning; and, additional

	damages incurred to our business may be assessed and reassessed in the future as we continue to identify more damages, as the damages are ongoing.
856	My family has a 120-year-old farm in Monongalia County (longer than Morgantown has been a city-fun fact). Our Farm is in jeopardy of being destroyed and becoming a roundabout. The DOT has given us "alternative options" that include a roundabout that demolishes our farm or turning lanes that are so big they take out my cousin's house and the house my grandpa was born in. We've had huge pushback from the residents as no one agrees with these egregious options, therefore my family, neighbors, and other landowners affected have come up with a community based solution option G: which has one turning lane and installs sidewalks (another thing resident want). Over 500 residents have signed this petition in 24 hours. Our county commissioners unanimously approved the roundabout BEFORE THE PUBLIC COMMENT WAS EVEN OVER. Its like a dictatorship here in Monongalia County, we need the Governors' help!
857	This letter is in response to the September 29th public meeting held by the Division of Highways for the Greenbag Road Improvement Project. We are greatly appreciative of the work you and your team has done in addressing this area of concern for our community and look forward to the continuation of this endeavor. The Morgantown Area Partnership is an organization comprised of the Morgantown Chamber of Commerce, the Morgantown Area Economic Partnership, The Monongalia County Development Authority, and the Campus Neighborhoods Revitalization Corporation. We at the Partnership would like to express our support for this project, especially in regards with the intersections of Greenbag Road at Mississippi Street and Greenbag Road at Kingwood Pike. Our downtown is heavily congested with truck traffic, which is a detractor to our attempts to improve the quality of life within our community. The options for truck and other vehicular traffic to travel Greenbag Road as an alternative to using our downtown as a passthrough - rather than the destination it is - will be a boon for our city and the region. We agree with our partners at the City of Morgantown and the Morgantown Monongalia Metropolitan Planning Organization that this project should commence as soon as possible with roundabouts to allow for a truck traffic alternative to WV 7. Please feel free to contact me with any questions.
858	I, and many others, feel that the DOH is going to be wasting a whole lot of money on the Greenbag Road project in Morgantown for something that is not needed and also not wanted. The proposed $10 million +/- budget will only provide minimum gains where a lot less money could be spent for about the same benefits. It should be quite apparent that a "roundabout" improvement project has not been well received and considered by some to be a "boondoggle." I personally have no problem with most of the improvements though I wonder if a cost analysis was ever done on the roundabout "fix." I feel that about the same benefits could be reaped from a much scaled down project. Let's look at some of the proposed plans and match them up with alternate plans and the reality of the situation. 1. Mississippi Street Roundabout - A stoplight is all that is really needed here. Traffic exiting the schools into a roundabout will be cut off by west bound traffic on the Greenbag Road. Simply install a traffic signal that can controlled with remote switches so bus drivers can turn them on when needed to either enter or exit, or put it on a timer for the start and dismissal of school. 2. While it is conceded that roundabouts at two mentioned intersections may be quicker, the difference is very small. Are roundabouts safer - maybe marginally? How about the argument that roundabouts work when the power is off-If the traffic light does not flash - it should and people usually just take turns. 3. The proposition that the use of Lower Cobun Creek Road can be used as a detour during construction is preposterous. Those combinations of roads around the in-question intersection are in extremely poor condition and curing the potholes and narrow one lane sections would be a very costly proposition. Now let's look at areas that I think we can totally agree on. 1. Our proposal should be cheaper. You wouldn't have to buy as much land and there might be some savings on paving as well. 2. Wider lanes the length of the Greenbag Road. 3. Better berms. 4. Sidewalks and crosswalks. 5. Irregardless of anything else the traffic lights should be on times to reflect the traffic patterns of the area. It is my hope that this letter shows that there are real problems to putting roundabouts on this project but that there are many more things that we agree on that should be done.

859	Change.org online Petition for Option G: A Community Based Solution for Greenbag Road Improvement Project. Signed by 1115 individuals. Summary of Petition: Advocating for an alternative intersection design, called Option G for Greenbag Road/Dorsey Ave intersection that landowners can support. Option G includes dedicated left turn lanes for Greenbag Road with the design features but no added lanes for Dorsey Ave and Kingwood Pike. Design features include widening traffic lanes, adding sidewalks to Dorsey Ave, and paved shoulder on Kingwood Pike. Benefits of this option: improve the safety; reduce impacts to natural resources; preserve significantly more farmland; reduce the amount of impervious surface; limit impacts to existing residences and businesses on Dorsey and Kingwood; account for additional historic and cultural preservation; reduce construction costs.
860	Why would you spend so much money on a roundabout when just widening, turn lanes and stop lights will fix. You spend way to much money on this stuff when there are roads and bridges that need repaired/replaced.
861	I am in favor of anything to improve this intersection. My preference would be turn lanes on the green bag road with a jump light. A roundabout may work, but it would have to be a better design than what the DOH has proven capable of in the past.
862	Please do not do this project. It makes no sense. The pike which would feed into it- it's a hazard normally in the winter- a secondary road- it's poorly maintained- like most of the roads in our counties not necessarily to our state road's fault but that of our state government- lack of competitive wages, benefits etc. Feeding a poorly maintained road into a traffic circle is asking for an accident and possibly loss of life, permanent disabilities which could involve school buses which hold our future of our state. Also the poorly designed traffic circle at the mile ground- it has a school off of it- it does not flow correctly- it jams like a spoke on a wheel- people stop in the middle because they feel scared, feel like we are still living in a small town let's be nice- people are still driving backwards thru it. You slide sideways because it's angled. All the land was not it, used- huge green space that should have been utilized- but we had to make it look pretty. West Virginia needs infrastructure- turn in and turn outs not turning lanes that's impatient drivers use as an extra lane for driving. We need road projects completed in a timely fashion. Road projects completed at night when it can be, for road work here in Morgantown not started as 30,000 college students come back into town.
863	I believe the proposed roundabout is not a useful allocation of monetary resources to improve the Kingwood Pike, Greenbag Road intersection. Widening of the roads to include turning lanes would be a better and more efficient endeavor. Thanks.
864	I think that this road upgrade can be done with turning lanes. A roundabout is not only unnecessary, but inappropriate as large trucks use this route and would be unable to maneuver through a roundabout.
865	I live off of Greenbag Road and drive through the intersection of Dorsey Avenue/Kingwood Pike and Greenbag Road daily. While I don't know that the "farmland" needs to be saved, I do believe that a roundabout in that location is not needed. At most, a turning lane with a leading green would work. However, returning to the days of a 4 way stop is all that is needed. The only cost incurred would be the pay for an employee to go out and set all of the lights to blinking red. Please don't spend more money than needs to be spent, not to mention the inconvenience to all of the residents, businesses, and school traffic in that area.
866	Put in the turn lanes and dedicated signals that were originally planned when you removed the perfectly acceptable functioning four way stop. Do not make a bigger mess than you already have. And unless it is mandated, trucks are still not going to use Greenbag Road, it is still quicker to go through town.

867	I strongly dislike the option of a roundabout. Why can't there just be turning lanes added to the Kingwood Pike intersection and a stoplight and turning lane be added to the Mississippi street intersection? As someone who drives through those intersections multiple times a week, I don't see roundabouts helping to improve traffic flow. Instead it will increase congestion, and likely lead to more accidents in that area.
868	There isn't traffic congestion on the Greenbag Road to warrant the use of tax payer money to build a round-a-bout. If you want to fix a problem area look at West Run Road. There are areas of that road that two vehicle can't pass.
869	I like the plan for Greenbag road, specifically the roundabout. This is a highly traveled road with 2 schools and a minimum security prison, and traffic often backs up at the proposed location for the roundabout. Also need improved marking of school zone outside South Middle
870	I drive this road daily during the morning and evening busy times. My oldest attends Covenant Christian preschool not far from this intersection. The traffic is no different than anywhere else in Morgantown during this time. I do not support the installation of a roundabout and the use of eminent domain to seize private land for this purpose. Please reduce the footprint, perhaps add a turning lane instead, or do nothing because honestly it doesn't add much time to wait. Thank you.
871	Trucks destroy Greenbag Road and are the worst part about traffic in the road - no trucks at all. The 4-way stoplight at Kingwood Pike, all that light needs is turning lanes. Turning lanes will improve it, while a roundabout will not help with improvements and will destroy much needed land.
872	I want to express my full support for the roundabout and all improvements on Greenbag Road in Morgantown. You do so little for our county, I believe this is the least you owe this state's third largest county. Please move forward with it.
873	No roundabout at Kingwood Pike, please!! Make turning lanes instead. Nobody has convinced the public why a roundabout would be better than turning lanes. And it does not justify forcing private property owners to sell their land to accommodate a roundabout. Aaron's Creek Road would have to be widened and repaired before it could serve as an adequate temporary detour for two-way traffic. That in itself would be a massive undertaking.
874	I often drive through this intersection around 5 pm. While traffic may backup through a few stoplight changes, the culprit is lack of left turn lanes rather than traffic volume. A roundabout with resultant taking of private property seem like using bomb when a fly swatter would do. A backup at other times of the day is rare, again due to lack of a left turn lane.
875	I fully support the project as proposed. I think it will greatly improve traffic flow on Greenbag Bag Road. The traffic lights that were put in at Dorsey Ave, Kingwood Pike and Greenbag Road only helped traffic flow in an hour or so in the afternoon. Other times the 4 Way Stop Signs were far more efficient.
876	This dangerous intersection is long overdue for reconfiguration. I fully support the proposed traffic circle
877	Although I don't have a problem per se with the plan, I do not think that it is needed. On average I travel that road weekly and never have problems with traffic. On the other hand, 857 between Pierpont Rd and Tyrone Rd is horrendous. Traffic backups occur daily and even on the weekends before things slowed slightly with the pandemic. Please spend the funds to widen the intersection of 857 and Tyrone Avery which would have much better impact than putting up a stop sign and stoplight which has only slowed down traffic.
878	We don't want a roundabout. The stoplight is fine. Put the money to fixing our roads (potholes) and let those people have their farms.
879	I am a long time resident in Morgantown's First Ward. As such I travel on the Greenbag Road via Mississippi Street frequently. I use this route in both directions, to Sabraton and to Don Knotts Blvd. I use it at various times of day, including busy times. I honestly never encounter any traffic problems at the intersection with the Kingwood Pike or with Mississippi. I oppose the proposed project which seems out of proportion to

	any need at either intersection. The 10 million could be much better spent to repair and improve Route 7 from Sabraton to and through Morgantown. That stretch of state road is in terrible shape. Narrow, poorly ditched and drained, dangerous turn, and pot holes beyond belief. Thank you for reconsidering this project.
880	I travel the Greenbag road every day of the week. I strongly support the construction of a traffic circle. It would greatly improve the intersection with the Kingwood Pike. I can't believe that a few people have delayed the project and are trying to stop it.
881	I fully support this project. 857 at Dorsey Ave is a nightmare, and a roundabout would do much to improve the traffic flow. People will complain about losing their property or increased traffic through neighborhoods, but that is an unavoidable fact of life when the city you live in is growing and you live adjacent to main routes. They need to get over themselves. Please move forward with these improvement as soon as possible.
882	Roundabouts are NOT needed. If you'd widen those intersections and have dedicated left hand turns with they're own lights, and a continued straight through lane, you'd save ALOT of money.
883	The Americans with Disabilities Act requires that all new and modified intersections, including roundabouts, be accessible to and usable by people with disabilities. How will the WVDOH address the accessible to and usable by people with disabilities for each alternative intersection design? Specifically, Federal Highway Administration, Office of Safety, stated Pedestrians with vision impairments may have more difficulty crossing roundabouts due to the following key factors: 1.) Pedestrians with vision impairments may have trouble finding crosswalks because crosswalks are located outside the projection of approaching sidewalks and the curvilinear nature of roundabouts alters the normal audible and tactile cues they use to find crosswalks. 2.) Roundabouts do not typically include the normal audible and tactile cues used by pedestrians with vision impairments to align themselves with the crosswalk throughout the crossing maneuver. 3.)The sound of circulating traffic masks the audible cues that blind pedestrians use to identify the appropriate time to enter the crosswalk (both detecting a gap and detecting that a vehicle has yielded).
884	According to FHWA, proximity of generators of significant traffic that might have difficulty negotiating roundabouts, such as high volumes of trucks or oversized vehicles (sometimes called "superloads"), may significantly influence the design requiring that a more detailed investigation of some aspects of the design or operation be carried out. Which site-related factors were investigated? Were "superloads" considered in the "Option F" roundabout design?
885	The Environmental Assessment fails to analyze the physical constraints for the intersection at Kingwood Pike/Greenbag Rd including steep grades, presumably "unfavorable" topography, and intersection skew. The WVDOH must address the topographical considerations and corresponding analysis given for each alternative intersection design.

	Topographical considerations include, but are not limited to, heavy logging trucks entering the intersection on a steep grade from the South, a geological slip on the southeast corner of the intersection, and extensive leveling and retaining walls needed for each alternative. Further, the intersection is located on an Oversized Truck Route (Greenbag Rd), please provide the geometry, splitter islands, truck apron, and off-tracking needed to accommodate the appropriate vehicles, and the associated land needed to accomplish each design.
886	A roundabout seems unnecessary in this location; however, any option that results in truck traffic being rerouted away from Brockway, South Park, Greenmont and downtown would be a huge improvement. If that can't happen, leave it as is or return to a four way stop.
887	I fully support the Green Bag Road improvement project, provided it is mandated that heavy truck traffic use this route rather than drive through downtown Morgantown (as they currently do). While I understand the reason this project is opposed by a small local farm, I believe the benefits for the greater community outweigh the preferences of a few people. The downtown truck traffic is a significant barrier to the revitalization of the city center, and it will benefit the community to have it removed.
888	There are many places in this county that this much road money could be put to better use - cut the brush along the roads, clean out the ditches so the water doesn't run out onto the road and cause more ruts, patch the potholes. The Arnettsville bridge on Route 19 was replaced with a bigger bridge but the other bridge had worked well for years! Buses have passed through the Greenbag Road/Dorsey Ave. intersection for years and have always been able to keep there schedules. Are you telling me that the traffic through there has increased by a hugh amount?
889	As a local resident and frequent cyclist, please strongly consider robust bike/pedestrian access to the Greenbag road corridor. This corridor could serve as an important connector for businesses and neighborhoods to access the Deckers Creek trail and Sabraton area. Additionally, cyclists frequently travel portions of the Greenbag road area to access Aarons Creek neighborhoods etc. A related but separate issue that should be considered is pedestrian/bike access under Greenbag road to connect White park trails to Dorsey's knob park, with access to businesses and services such as MUB's offices along the way. A safely bike-able/walkable Morgantown is key to our City's long term growth and wellbeing!
890	I do not agree with the decision to put a roundabout on greenbag road. I live in the first ward area and drive on that road daily. A turning lane at the intersection of greenbag/Dorsey/kingwood pike would be more than adequate for the traffic. The argument that it will increase the truck traffic does not seem likely since they can use the road now and do not. I do not see how putting in a roundabout is going to make it easier for trucks to use the road. This project seems like a waste of money that could be used for other projects. Dorsey is in desperate need of sidewalks. This is just one way that the money could be used in a useful way.
891	I believe roundabouts are a horrible way to deal with traffic. The loss of green areas.in Morgantown is sad. Each town I come home to visit I am disappointed in the removal of the green fields for the greed of businesses.
892	LEAVE THE FARM AND THEIR FAMILY ALONE! THESE ROUNDABOUTS ARE A WASTE OF LAND AND MONEY! WV DOES NOT NEED TO BE TAKING UP FARMLAND AND PEOPLE'S HOUSES FOR ROUNDABOUTS. PUT IN STOP LIGHTS AND SIDE WALKS AND LEAVE THE FOLKS ALONE!!! I LIVED IN MORGANTOWN FOR OVER 50 YEARS UNTIL RECENTLY. FARMS PROVIDE FOOD....THAT GOES TO THE STORES. IF WE KEEP TAKING FARMLAND FOR THIS AND THAT PRETTY SOON FARMS WILL NOT EXIST! AND STOP BOWING DOWN TO WVU , THEY ARE TAKING OVER THE STATE LIKE COMMUNISTS TRIED TO TAKE THE WORLD OVER! NO ROUNDABOUT! AND THOSE THINGS ARE DANGEROUS! LEAVE THE FARM AND HOUSES ALONE AND PUT IN TURN LANES AND STOP LIGHTS AT THAT CORNER. AND SIDEWALKS. AND THEN LEAVE THINGS ALONE!

893	I think a roundabout is a great and much needed solution to this intersection. Obviously the people whose land this will affect are opposed to this. Their argument for a turning lane with sidewalks is a weak one and I don't think will help reduce traffic like a roundabout. Build the roundabout.
894	I truly don't understand why the DOH feels that round about's are the answer to everything. They wanted to put one in Sabraton and it would have been a disaster. The round about on the mileground is to small. I agree that a turning lane would be the best solution to the traffic issues on Greenbag Road. I also don't understand why Fairmont and Clarksburg have 4 and 5 lanes each way on 79 and Morgantown which probably has more traffic and is only has 2 lanes.
895	I live right by this intersection and a roundabout is not needed!! A left turning lane on Greenbag Road would fix the traffic issue. I am VERY AGAINST destroying all that green space for a roundabout that nobody wants!!
896	I am 100% for the roundabout planned on Greenbag road in Morgantown. Traffic due to turning left from either direction on Greenbag is way too difficult.
897	Keep it Simple, make a turning lane. I've traveled through that intersection for decades. Listen to those who experience the traffic problem.
898	Please it alone
899	Please do a turn lane. There is no need for a roundabout. There is only a window of high traffic and that is 3-6 window. A turn lane will alleviate this need. - Keep supporting farms and families.
900	There is no reason for the roundabouts in that area. You will destroy 3 properties to save a 2 times per day when people complain. Buy the old restaurant and put in turning lanes in to solve the problem. There is plenty of land in the old restaurant area to expand the road and change the traffic pattern.
901	The roundabouts are not a horrible idea. I worry about the construction phase, it would have the area shut down for some time. A lot of people use the pike to get to and from kingwood or as an alternate route when 7 is closed. I think the pike/greenbag intersection would be better suited with a long right-turn lane on every approach (or even just on greenbag rd). In addition to that, all the approaches need a dedicated left turn lane with a light that works correctly. This would allow all right turning traffic to go on red if able, the straight thru cars will be ready in a line and will be more efficient, and the left turners can be in their lane. This would widen each road by only two lanes each (and could be mostly done without affecting traffic flow). You could add another lane for right turners to turn then merge as well. Even if just greenbag had right turning lanes dedicated that could go on red, and dedicated center/left turn lanes that were light controlled, that would increase flow. I don't understand why there are sidewalks, i have never passed a pedestrian walking on that road. Maybe because there are no sidewalks, but maybe because no one does. Also, if the roundabout goes in, why would you want to cross both directions of traffic as a pedestrian. Why not go to the center then whichever direction you needed. The proposed plan show each crosswalk crossing both directions of traffic, so now i have to think, nothing left or right, and nothing turning from the circle towards me. If crossing directly into the center, you only have to look at one direction of the cars travelling counterclockwise.
902	A round about a both locations make the most sense. I am tired of a handful of complainers stymying improvement of transportation issues in Morgatown. I chaired the 1997 Transportation Study and few of the recommendations made have come to reality because of complaints from less than 1% of the the county's population! Due what you know is the correct plan.

903	I would like to express my opposition to both of the proposed roundabouts on Greenbag Road. The intersection with Kingwood Pike works fine with the traffic light. A left hand turn light & lanes makes more sense than taking the Hastings family land & the farms for this roundabout. Arguments, such as proposed by Mr. Austin of MPCO, that the traffic lights go out in bad weather are just irrelevant. How many times per year does that even happen? "If it ain't broke, don't fix it" Is my advice. Same for the intersection with Mississippi Street. No need for a roundabout there, at all. Please devote your resources to projects that are needed instead of wasting resources on these 2 roundabouts.
904	Please consider alternatives to the proposed roundabout on Greenbag road. Turning lanes, for example, would have much less negative impact on the surrounding homes, farmland, and visual aesthetic, as well as being less confusing for drivers.
905	This decision to make a round about at the end of the Kingwood Pike is nonsense. 1st, there is not enough traffic that would would should even spark the idea of this type of change. I have been driving that road from Kingwood to Morgantown for over 25 years and I have never seen the intersection backed up like something of what was on the Mileground. If anything, just do a turning lane at the intersection of the Pike and the Greenbag Road and that would do the job. The family with the farm should be able to continue to keep their land. There are too many projects in the US that are ruining farmland. We need to preserve our farmland for the future. I don't think any thought was put into the project as far a detouring either. Aaron's Creek Road is not fit for traffic while the project would be in progress. That would hold up school buses as well. Please DO NOT do this project. Keep the Kingwood Pike and the farmland as it is now.
906	Two roundabouts in such a short distance makes no sense. The Mississippi Street area does not even have a traffic light now! Why is a roundabout needed at that spot, let alone the Kingwood Pike intersection? There was to be at least one turning lane when the traffic light (that replaced the 4-way stop) was originally put in at the Kingwood Pike/GB Road intersection. That NEVER happened--no money was the excuse. Aarons Creek Road is a disaster to use as a detour. Has anyone ever tried to drive that road in the winter time or even in good weather? I double dare you to do so -- that includes DOH employees, our County Commissioners and the MPO. You take your life into your own hands as you try to get onto the Pike from Aaron's Creek to turn left or right! The construction company working (MUB DAM PROJECT) the other side -- Cobun Creek, which is not nearly as dangerous--has 2 flagmen stopping traffic to get their vehicles in and out. Will someone be stationed at Aaron's Creek to flag traffic in and out safely. NO, of course not. This is a big waste of money when turning lanes or a left arrow on the light would be the best and least expensive solution. NO TWO ROUNDABOUTS. Is it going to be a money maker after completed to charge for an amusement ride of loop de loops?
907	I live in South Park and travel often using the Green Bag road, at various times of day. I understand that traffic circles are proposed at the intersections of Dorsey and Mississippi streets. These are both unneeded and very costly projects that better solutions could be made. At Greenbag and Dorsey traffic increases in the rush minutes or when school busses are present at 2:30 PM and again at 5 pm. A turning lane would seem to be a more sensible solution here, with a traffic light allowing left turns. Mississippi dead ends at Green Bag so a three road circle is proposed. Hiring a crossing guard to allow school busses to enter Green Bag at two times a day would be a whole lot cheaper, and maybe a traffic light triggered to change when busses are present would work. The savings could be used to properly fix the road surface on Rte 7 which is in deplorable condition from Green Bag most of the way into downtown Morgantown.
908	I visited the Greenbag Improvement site on line find out more about the plans to construct roundabouts on Greenbag Road. Many citizens have submitted comments and, of the 264 comments published on the site, I found only16 that were in favor of the roundabout plans. Those opposed noted that there are few times during the day that there is any backup of traffic and suggested that turning lanes would alleviate that problem. The poor road conditions, from the Kingwood Pike to others in the area, were mentioned with concern that maintenance needs to take precedent over costly new, unnecessary construction. The site also summarized submitted concerns and presented responses that supported

	the roundabout decision that address “both current conditions and design year 2048 predicted conditions.” While it is admirable that the plans are made with the future in mind, I am looking forward to seeing if the overwhelming public responses against the project will be heeded.
909	I firmly believe we should protecting as much of our green space as possible, and as a resident of Morgantown, all I see is the opposite. A new development here, a new roundabout there. We’re developing beyond our needs.
910	I'm trying to view the Environmental Assessment for this project, but the link isn't working. Can you offer any assistance?
911	The option as listed below, combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA. These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would: Improve the safety and access for motorized and non-motorized connections; Reduce impacts to natural resources; Preserve significantly more of the adjacent farmland of statewide importance; Reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands; Limit disturbance to unsuitable soils with a history of slips to prevent likelihood of property damage or loss; Limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation; Reduce construction costs. Refer to this proposed option as “Option G”. I support this “Option G ‘ as “preferred”
912	As a resident of Morgantown and frequent user of Greenbag Road, I do not support a traffic circle at Greenbag and Dorsey. I greatly value the farm on that corner and the value it provides to the community. I would prefer a turn signal on Greenbag, which would help elevate the traffic congestion at that intersection. Thank you
913	I love roundabouts but I do not support one at this intersection. I travel this way every day. It really isn't that busy. All it needs is a turning lane and an arrow or even go back to the 4 way stop. Honestly, there are several other intersections in Morgantown that could use improvements over this one. The only time it is even backed up is for about 6 minutes when the school lets the buses out of the parking lot. Downtown gets 1,000 times more traffic and all they use are turning lanes. Please put in a stop light at the parking lot exit of the Walmart on University Town Center (near the WVU Medical office side) instead - now THAT is a pain to get out of and dangerous.
914	I strongly approve and encourage the proposed Greenbag Road improvements. Especially including roundabouts.
915	Please add crosswalk to connect White Park and Dorsey Knob. Also, preserve the community garden. We need more community spaces
916	I support the proposed roundabouts for the Greenbag corridor in order to improve traffic flow and to encourage truck traffic via that corridor rather than through the downtown area. Multiple roundabouts are a must; the backups that occur in the mileground area are the result of establishing only one. We have witnessed the success of multiple roundabouts in Florida and other parts of the country and are firm believers in the various benefits of such configurations. It's our hope that the MMMPO will move forward with these plans.

917	Please complete the vitally needed roundabout and sidewalk improvements on Greenbag Road. A 70 acre farm can afford to sacrifice just over one acre for something that would do so much good for our community. We have the third most populous county in this state (and growing) while state government spends precious little on our infrastructure needs. This modest investment in our community is of vital importance to us.
918	The roads we have need massive repair. Why build new roadways when we can not fix the ones in place. That makes no sense whatsoever.
919	I brave Greenbag Rd every day- sometimes more than once. Greenbag Rd only needs a turning lane at the intersection of Dorsey! Traffic flows well otherwise. A roundabout is a waste of tax payers money and destructive to the business and agricultural land in that area. The roundabout that was 'so necessary' to ease traffic flow on the Mileground is a complete nightmare and has done nothing to ease congestion. A roundabout at Greenbag/ Dorsey/Kingwood Pike will be just as disastrous! Spend our money wisely city council! Morgantown traffic needs improvements not more nightmares!!
920	I general I support the overall design of improving Greenbag Road including the two roundabouts. It should enhance traffic along this road and hopefully reduce large vehicle traffic on Route 7 through downtown Morgantown. However, I feel that pedestrian and cycle safety and use would greatly benefit from a shared path design rather than sidewalks. Other cities in the U.S. have implemented the shared path model for pedestrian and cycle improvements along major thoroughfares. Secondly, the present design limits safe access to the Mountaineer Mall. I suggest a signaled crossing at this property. Thank you for the opportunity to provide this feedback.
921	As residents of Bluegrass Village, my family will be impacted by this project on a daily basis. We are well aware of the rush hour traffic congestion on Greenbag Road which often makes it difficult to enter or exit Bluegrass Village at these times, and westbound travel toward 119 is often delayed by incoming and outgoing school traffic on Mississippi. We would be fully supportive of Alternate 1 with the 2 travel lanes and continuous turn lane between Mississippi and Dorsey/Kingwood Pike. As a long-time resident and witness of a number of road "improvement" (some more so than others) projects, the center turn lane concept seems to have helped greatly with traffic congestion on Route 7 near Krogers in Sabraton. We are also fully supportive of Alternative 2, Options A (a much needed traffic signal at Mississippi Street) and E (dedicated turn lanes at Dorsey/Kingwood Pike intersection). We witness traffic congestion on a daily basis resulting from the lack of a signal at Mississippi and the lack of turn lanes/left turn signals and the Dorsey/Kingwood Pike intersection. We VEHEMENTLY OPPOSE the construction of a roundabout at either location. Roundabouts seem to be satisfactory in quaint one intersection small towns, but in our experience do not handle large volumes of traffic well. The roundabout on the Mileground is an absolute nightmare such that we and many other local drivers take detours to avoid it at all costs. We absolutely DREAD the prospect of being hemmed in by roundabouts in both directions when exiting Bluegrass Village. Finally, we are fully supportive of plans to construct a sidewalk along Greenbag Road.
922	Why has an archeological survey not yet been conducted? It is my understanding artifacts, and historical items are of grave importance when demolishing land with such a rich history. The landowners are prepared to go forward with an official archeological dig if the Project leaders do not prepare one.

923	The roundabout on the mileground has proven to be a hellacious nightmare 75% of the time. What are those times? School dismissal, changing classes for WVU students, and after work traffic. A roundabout on Greenbag road isn't going to make the clustered traffic at peak times better, it's going to make it worse, because so many people don't understand roundabouts and it takes way longer to get through than necessary. I can count 5 times in the last month that I've sat in standstill traffic in the roundabout, leading up to, or leaving for 15+ minutes. This just seems like a lose-lose situation for everyone.
924	I live on The Pike. We do not need a roundabout. You cannot be serious with an Aaron's Creek detour. Someone will get killed on that road, and will sue the state and win. This is a disastrous move.
925	Just add a turning lane to each side of the 4 way light. Simple. Traffic isn't like it was there 8-10 years ago, so that will work just fine. A roundabout in Morgantown is not a good idea. Noone knows how to use them & it's just more frustrating for drivers. In addition, eminent domain is vile unless the situation is dire-- and certainly this situation is not.
926	Please discontinue the plans for the Greenbag Road/Kingwood Pike roundabout. I've been a resident of the area for nearly 25 years, and while the four-way stop was a nightmare, the current stoplights are sufficient traffic control. If the issue is turning, you could alter the timing to effectively address this need. The cost-benefit of the roundabout is clearly heavy on the cost side with limited, if any, benefit. This roundabout's financial cost is high, and the impact on the current landowners is extreme. The roundabout planning should be suspended. I travel the road and traverse the intersection on a daily basis, so I'm speaking from an educated user's perspective. Thank you for the opportunity to provide comment, and I hope you will consider the public perspective. Sincerely, David Michael
927	I do not support the construction of a roundabout on Green Bag road. I believe a better option would be to construct turn lanes on Green Bag road.
928	Turning lanes on the Kingwood pike is a better option than a round about that destroys green space, farmland and people's property and homes.
929	I travel through this intersection frequently. The amount of traffic and the wait time for the light is minimal. I travel through here so I don't have to deal with the congestion in Sabraton. A turning lane would be more than sufficient for this intersection.
930	Putting a round about/traffic circle at the intersection of Greenbag Rd and Dorsey Ave makes no sense, monetary or otherwise. There is no need to spend lots of money and time to fix such a minor problem. A simple fix would be to put turn arrows and turning lanes in on Greenbag Rd. No need to destroy peoples' property and spend money that could be used to fix many of the messed up roads in the area.
931	I strongly oppose the conversion of family farmland near Greenbag Rd into a roundabout. Morgantown is such a special city because it combines the cultural resources of a much larger community with abundant natural beauties–lakes, creeks and rivers, forested hills, and productive family farms. Once a wooded hillside or family farm is gone, it is gone forever. It is especially inappropriate that this valuable resource would be sacrificed to facilitate traffic in our city, which is already at the saturation point.
932	NO.
933	I travel the Kingwood Pike everyday. The options for detours for larger trucks and school buses is non existent. The intersection only needs turning lanes. Please consider the public's cry for no round about. Thank you.
934	Roundabouts are a hassle in my opinion. Lot of wasted space that can be handled much better with turn lanes. I find them confusing and a traffic accident waiting to happen. If this is going to cause people to lose their home it is better to use the less confusing turn lanes. I try my best to avoid the roundabouts that are in town as it is. This one will be by my church and I am not pleased by the thought of it.

935	The proposed project is contrary to the public interest.
936	Build this roundabout already. It's the best solution for most intersections. Please change more intersections to roundabouts, the Patteson, Buroughs, van voorhis intersection should have been a roundabout 20 years ago.
937	I request that an Exit be put at the I-68 bridge right up the road the proposed Greenbag Roundabout. The proposed roundabout will interfere with my plot(in Hastings Farm) on which i plant corn & vegetables for my family.
938	The WVDOH has failed to provide information sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned; the agency has failed to disclose accurate information pertaining to numerous businesses, food sources, green spaces, waterways, and community resources that exist in the area of disturbance, but are not represented in the Environmental Assessment.
939	I travel the kingwood pike almost daily and there can be some traffic delays. With that being said the roundabout project makes no sense in multiple ways. The cost of this project is absurd when there is supposedly no money to fix the current roads, for example, there is a slip only a quarter mile up the kingwood pike that has been patched multiple times over many years, but there's never enough money to properly fix it. I live on a small back road and if it wasn't for the people that live on this road maintaining it, we would have trouble getting in and out of our homes. The proposed detour route is not suitable. At best it is a one and a half lane road only suitable for cars. There is no way large trucks and tractor and trailers can use Aarons Creek Road every day for the amount of time it will take to complete this project. The multiple acres of private land that would need to be taken is ridiculous and will ruin the property value of many people's propriety, I understand that Morgantown is growing and the infrastructure needs to be improved, but this project is not what the people that live and travel this area want this is a project that the county commission wants. They will do anything to try and keep large trucks out of downtown Morgantown and this will not help that at all. The county commission only cares about the town and are in no way in touch with what the rural areas of the county want and need. I am in no way against improvement I feel that adding turning lanes is a better solution to the traffic delays in this location and would cause less inconvenience to the people that travel this area and would be much more economical to the taxpayer.
940	I would like the department to find an alternative to the proposed roundabout that will preserve the community garden. I signed a petition that I support that is described as such, "This petition is to gather support for an alternative option to the Greenbag Road Improvement Project. We call this: Option G It is a Community Based Solution to the existing alternatives. The option preferred by ALL PARTIES, as listed below, combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA. These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would: Improve the safety and access for motorized and non-motorized connections;

	Reduce impacts to natural resources; Preserve significantly more of the adjacent farmland of statewide importance; Reduce the amount of impervious surface, causing fewer impacts to nearby streams and wetlands; Limit disturbance to unsuitable soils with a history of slips to prevent likelihood of property damage or loss; Limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation; Reduce construction costs. The Concerned Parties and Interested Parties (The Landowners) , as listed below, unanimously support this “Option G ‘ as “preferred” " I believe the community garden to be a very important part of Morgantown even though it is located outside the city limits. The garden provides a source of community and is often worked by volunteers from the friendship house, whose patrons are largely drawn from the homeless population of Morgantown. By working in the garden the patrons of the friendship house are able to feel self worth and expend their labor into something that is productive and beneficial to our community. Regards - Nicholas Stamm
941	Two roundabouts are definitely not needed or wanted here. Turning lanes are only needed during peak hours for about a 20 minute time period. I support the no build option.
942	The Morgantown Pedestrian Safety Board would like to thank the WVDOH for the many infrastructure improvements that have been completed in and around Monongahela County. We appreciate the open public forum to consider plans for new projects. We are aware that many proposals have recently been developed, and we share your vision to improve safety and efficiency within our transportation system. We would like to offer input to the non-motorized transportation accommodations within the designs for Greenbag Road. There is great opportunity to provide residents with walking and biking alternatives to access schools and businesses. Our suggestions will lead to reduced motorized vehicular traffic and congestion in this key corridor. Please consider these recommendations to provide safe access between the residential complexes, schools and commercial enterprises such as the Giant Eagle grocery store, Goodyear Auto, Center City Auto Body, and Mountaineer Mall complex: -pedestrian crosswalks (1) near the Mountaineer Mall, (2) adjacent to the Roundabout, and (3) other key crossings -a multi-use path with buffer along the entirety of the Greenbag Road to allow safe walking and biking -a multi-use path or sidewalk along Mississippi Street
943	My husband is a CDL driver. He is very upset about the round about idea. It will not work in the best interest of the truck drivers or the public. He can only drive on the round about if he is driving a small 28 foot trailer, yet still avoids roundabouts at all cost, He can not drive on them at all if he is driving a 45, 48, or 53 foot trailer which is what he generally is driving. Please drop this destructive, intrusion, disaster of an idea. Please leave Green Bag Rd. alone. Thank you.
944	I am a resident of Zinn Chapel Rd off of the Kingwood Pike in Preston Co. My husband and I both travel the Kingwood Pike to the city of Morgantown for work daily and have for 13 years. I have traveled through the intersection of Dorsey Avenue/Kingwood Pike at peak times for a long time and never felt the intersection needed more than left turning lanes. One of the DOH’s claims of necessity for these proposed roundabouts are to divert trucks away from downtown Morgantown. I have been told for years that the trucks take the downtown route as opposed to Greenbag road for two reasons: 1. It’s shorter which equals less road tax that they pay and 2. They avoid the curved steep hill at

	the intersection of Greenbag Rd and Don Knotts Blvd. So the impression I have been given is that the trucks will not utilize Greenbag Rd whether or not there are 2 roundabouts that are going to cost MILLIONS of dollars. Furthermore, how can the WVDOH justify millions of dollars for this project where traffic is slightly congested a few times a day when we have hundreds of other roads in North Central WV in dire need of paving, some that are slipping over hillsides, including the Kingwood Pike????
945	Unfortunately, the assessment does not prove the need for this project.
946	how will you guys address light pollution? This is the most beautifully dark area of Morgantown, it would be a shame for a bunch of streetlights. For humans and wildlife. How will you address this for minimal impact?
947	Y'all are gonna take Garrett Richards land?!?!?!! The old Anderson farm? The apple farm? Tommy Richards? Shame on you!
948	How do you sleep at night? No One Wants This! Why are you disregarding the public?
949	Keep Morgantown green! Put in a left turn lane. A roundabout? Idiots!
950	How dare you guys destroy Morgantown's only hemp farm. A small business. During these times. Atrocious
951	What state do you think this is? This is West Virginia. WILD AND WONDERFUL. How can we be wild and wonderful if you keep tearing down all the trees taking peoples farm land houses and animals who live there? This ain't philly!! Leave our people alone
952	Bowles Rice LLP represents Mary Hastings, one of several principals of Joy and Hemp Universal LLC and owner of land situate in Monongalia County, West Virginia, at the corner of Greenbag Road and the Kingwood Pike, described for reference as Tax Map Parcel 9-48A-11 (the "Hastings Property"). The Greenbag Road Improvement Project (the "Project"), referenced above, intends to widen roads and shoulders and install roundabouts. Said Project appears to, according to the presently proposed boundary of disturbance, require the condemnation of the entirety of the Hastings Property. You have been notified by Ms. Hastings and others whose property interests will be taken by this unnecessary and broadly-tailored project, through public comment and otherwise, of the myriad of procedural deficiencies and resulting inaccuracies in and inherent to the Environmental Assessment and other Project reviews, documents, and institutional commentary. We urge you to address these deficiencies and correct these inaccuracies before the Projects moves any further, the failure of which will result in significant and unnecessary, further delay. We write today regarding one specific inaccuracy that has pervaded Project documents and statements made by the Monongalia County Commission and others — the representation that no business will be affected by the Project. To the contrary, the Hastings Property is the primary operations site for Joy and Hemp Universal LLC; its hemp product is grown 100% thereon. If the Project proceeds as planned, Joy and Hemp will be forced to close its business. It is unclear why Project documents and those contributing to them continue to represent that no business will be affected by the Project. It certainly appears as if those involved simply do not value and respect this particular West Virginia small business. Yet, it has also been suggested that hemp operations simply move to other land owned not by Ms. Hastings, but other land owned by Ms. Hastings' relatives. For many reasons, this is not a viable solution. While incredulous that Project leaders and administrators are unaware of the significant impact the Project will have on Joy and Hemp Universal LLC*, we hope that any factual inaccuracies concerning the impact on Joy and Hemp are borne of misunderstanding or a lack of knowledge. In that regard, please let us know if any documentation from Joy and Hemp is required to illustrate its interest in this Project.

	We thank you all for your efforts. Note* The State of West Virginia, by and through the Monongalia County Prosecuting Attorney's Office, recently obtained a favorable restitution award for Joy and Hemp through the prosecution of an individual for larceny of hemp from the Hastings Property.
953	It is not appropriate to disregard alternatives merely because they do not offer a complete solution to the problem. - US Courts via NEPA
954	The Greer limestone trucks are private contracting truckers will take the fastest and most fuel efficient route, always. The Greenbag Road, with widening and new intersections, will be neither faster, nor more fuel efficient than their existing route through downtown Morgantown. City officials should be made aware.
955	Thank you for extending the comment period for the Morgantown Greenbag Road project. Our family has lived in the First Ward neighborhood, which is next to Greenbag Road, for 29 years. My husband and I use the road as we travel to work and to the grocery store. While we notice more traffic during the parts of the day that work and school begin and end, it has never been a terrible inconvenience to travel this route. Rather than constructing a roundabout, I believe that left turn lanes (and arrows) would work nicely. It seems a shame to cause a hardship on the local farmers near the Kingwood Pike intersection if the traffic flow can be improved without using their land.
956	In a recent conversation I had with a local Civil Engineer with road design experience, he indicated that roundabouts generally work best where all 4 directions of an intersection have about the same amount of traffic. That's really not the case at either of the 2 proposed Green Bag Rd roundabouts. In addition to the over 1100 residents who signed a petition in Nov OPPOSING these roundabouts, the lack of balanced traffic at these intersections is another reason to pursue a different solution for this road, e.g. left turning lanes.
957	The WVDOH, and/or other parties vested in the proposed Greenbag Road/Kingwood Pike roundabout, has not compellingly demonstrated the need for construction of a roundabout at the proposed location. The WVDOH has not effectively and definitively demonstrated that the proposed roundabout will solve any actual defined problem. In short, the WVDOH has not justified the expenditure of public monies that can be more justifiably and reasonably be utilized for other more worthy public works projects in Monongalia County. I am always in principle inclined against •development for development's sake•. The proposed roundabout is an expensive solution in search of an actual real world problem. In my opinion, the proposed roundabout does not represent a responsible expenditure of public funds and, in this regard, the rationale for this project does not justify public taking of private lands required for completion of the project scope of work. For these and other reasons, I urge the WVDOH to explore and identify viable (and much less expensive) alternatives to the roundabout project proposed for the Greenbag Road and Kingwood Pike intersection.
958	Letter submitted to M. Dean: I am writing to you today in response to a couple of articles you have published regarding the Greenbag Road roundabout. There has been some public awareness about the potential loss of the Hastings farmland where the proposed roundabout would be located. There is more to this proposed destruction, of local interest, that has not been publicized. I live at 27 Kingwood Pike, in a brick home that overlooks the intersection of Dorsey, Greenbag, and Kingwood Pike. To Morgantown natives who have lived here over the last 100 years, they may know it as the Anderson Farmhouse. The farm itself covers 75 acres, and has frontage along Kingwood Pike, Greenbag Road, and Aaron's Creek Road. My Great, Great, Grandfather purchased the farm in 1900, as an addition to his farm that occupied where the Kennedy Federal Correction facility now exists. His son, and my Great Grandfather, JD Anderson, built his own house and farm buildings around 1920, and now a century later, my young children are the sixth generation to live and experience agriculture on our farm. My Great Grandfather was involved with agriculture and the community on a local and national level. Some of his contributions and achievements include - one of the first pipeline milkers in the state, which was the new and efficient way to milk cattle; farm produce and goods sold to Hotel Morgan

	in the 1930s; Co-founder of Sanitary Ice Cream, which provided dairy goods around Morgantown in the early 1900s (still advertised on the wall at Mario's Fishbowl on Richwood Avenue; member of the Mon General Hospital Board, and the namesake of Mon General's main road; inductee of the WV Ag Hall of fame; served as one of 13 appointee in 1953 by President Eisenhower on the first board for Congressional Farm Credit Act, which developed policies to get American farmers needed loans. Due to unsuitable soil conditions for road building at inception in the 1960's, all structures of the farm were condemned and razed, with the exception of the home. Now with more proposed destabilization of soils and high cut walls on Greenbag Road and Kingwood Pike, our historical home is at risk, and the State may finish the destructive path they started. As for the roundabout itself, another option needs to be taken into consideration as the leading alternative for the roundabout at the Kingwood Pike and Greenbag Road intersection. Neither the WVDOH, nor MMMPO seem to want to acknowledge the best solution to current and future traffic flow in that area. It's irresponsible to ignore the large amount of public responses from WVDOH's public presentation, that has been overwhelmingly against the roundabout option. Improved vehicle traffic flow and pedestrian accessibility can still be achieved without a roundabout. Left turning lanes only on Greenbag, with arrows allowing protected turns onto Dorsey Avenue and Kingwood Pike would be efficient. Dorsey Avenue and Kingwood Pike do not need added lanes to address traffic flow, which in turn reduce construction costs, reduce property acquisition costs, and do not displace any residences. Roundabouts can be cost effective, when it is new construction, or large public right of ways, but this is not the case here. In fact, the roundabout could end up being more dangerous for pedestrian traffic to cross avenues, as drivers may not need to yield, or look in both directions as they enter. Traffic congestion peaks during school dismissal and the typical morning and 5 o'clock rush, but otherwise flows efficiently. What parts of town don't have the same peak use, yet operate sufficiently without a roundabout?! A professional independent traffic study in 2015 counted only 6% of traffic during peak hours as trucks. Wasting time and money on the roundabout will not alleviate traffic patterns through downtown; the latter is simply the shortest, easiest route for trucks. The Greenbag corridor is fairly developed already and to say that the roundabout is necessary to accommodate future traffic levels, that couldn't be remedied by turning lanes, is a misrepresentation. Eliminating a single stop light, which has been represented by MMMPO as a two minute savings is not a make it or break it scenario for any driver. Adding two roundabouts on Greenbag would likely increase commute times during non-peak hours, because traffic will be forced to drastically slow down on the approach and exit. The likelihood of the roundabout and its support from the aforementioned organizations, along with our County Commission is simple. Its low hanging fruit, and officials can say "Look at these road improvements we made" without having to quarrel with Charleston and District 4 over funds and priorities, while the real congestion and degradation of roads in our county continue. That, along with the facts that the number of property owners impacted are few and the public may be indifferent on the matter, are a good look. Am I personally vested in objecting to the construction? Yes. At worst I am at risk of losing my historic home, and at best, I will have a large, obscene roundabout less than 100 ft. outside my door. Is there a better alternative to what's been proposed? Yes. A group of property owners who stand to lose the most, have sent a joint letter in favor of turning lanes on Greenbag, to WVDOH engineers in Charleston. Hopefully the community will voice their support for this alternative, and help these farms that combined, have supported the community for almost a quarter millennium. The public comment period has been extended through the end of November. For anyone who passes through that area, that might say that their commute needs to be faster, realize that it's not nearly as bad as other parts of town, it's probably why you chose the route to begin with. It's certainly not as scenic as other parts of town. When you pass by, enjoy some of Morgantown's history, greenspace, and agriculture while it's still here.
959	I am writing to oppose the roundabout for the above intersection. Two different letters to the Dominion Post express my sentiments precisely. The second was titled "Fund real road repairs, not pet projects" and appeared in the Dec. 20, 2020 edition. It was the featured letter to the editor and criticized spending millions on this project. while roads in our state are either crumbling or in dire need of repair (giving a

	number of specific locations). When we moved to Morgantown in 1977, I saw how deplorable the roads not only in Monongalia County were, but across the state. We voted for repairing these roads not that long ago, and we were promised we would see improvements. Not much has improved. We still have to dodge potholes or rough pavement whenever we venture to go anywhere. David Ervin wrote the letter just cited and should be praised for citing his opinion. The first letter was titled "Proposed roundabout threatens historic home" and appeared in the Dec. 6, 2020 edition of the Dominion Post. Again, it was the featured letter to the editor and was again given the prominent position on the Opinion page C-1. It asked people to contact you and complain. I agree with Garrett Richards in his cry for reason about this project.

Table 3: Response to Comments

Comment Number	Comment Response
1	The simulation referenced here is the WVDOH video introduction to roundabouts and does not represent the design for either of the Greenbag Road proposed roundabouts.
2	We appreciate your input regarding the project.
3	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
4	We appreciate your input regarding the project, however please refer to the EA for additional detail on the need for the preferred alignment. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
5	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
6	The online commenting period was available beginning on September 29 and ending on November 30, 2020.
7	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
8	All comments received via the online system are included as part of this project record. This comment was provided prior to the public meeting on September 29, 2020.
9	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
10	We appreciate your input regarding the project.
11	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
12	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
13	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. A traffic study was completed in 2018 to determine the current conditions and provide data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries.
14	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
15	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
16	The chat window was available on the project's public input website during the virtual public meeting on September 29, 2020 from 5 to 8 pm.
17	We appreciate your input regarding the project.
18	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
19	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
20	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
21	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
22	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.

23	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
24	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
25	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
26	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
27	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
28	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
29	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
30	Please refer to the EA which evaluates the potential impacts of multiple alternatives on the surrounding area and recommends the preferred alternative as meeting the purpose and need.
31	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the traffic signal to provide a protected/permissive left turn phase on Greenbag Road. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different vehicular maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, the traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilizes as a signed detour. The anticipated plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

32	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
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38	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
39	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
40	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

	with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
41	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
42	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal

	Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.
43	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
44	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
45	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.
46	The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address.
47	Thank you for providing a response to our survey question regarding how you learned about the virtual public meeting.

48	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The traffic study completed in 2018 determined the current conditions and provided data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Traffic entering a roundabout on each approach does not need to have the same volume of traffic in order to function optimally. Each roundabout is designed and adapted to the context of its location. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection.

	One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The estimated construction cost for the Preferred Alternative with Intersection options C at Mississippi Street and F at Dorsey Avenue/Kingwood Pike is $10,429,195.49. Funding for the project will include both State and Federal highway funds. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

49	This comment was addressed directly with the commenter during the public meeting.
50	Shifting the roundabout will not be feasible due to the proposed retaining wall and additional property acquisition. While permanent right-of-way will be required from this parcel, construction of the proposed project is not expected to notably affect operations or result in a total take / displacement of the property.
51	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
52	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The property owner of the parcel near the proposed Greenbag Road/Dorsey Ave/Kingwood Pike intersection will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and

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53	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
54	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
55	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

56	Test comment from public meeting team
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59	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
60	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

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61	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
62	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
63	All roadway crossings will be marked and signed as crosswalks. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers including older drivers as well as pedestrians and cyclists.
64	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
65	The public meeting summary, including all comments and individual responses, will be included in the final environmental document.
66	Drainage issues within the project footprint will be addressed by the project design.
67	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

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68	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
69	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO’s preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.
70	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
71	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
72	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
73	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
74	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be

	developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
75	The contractor will be responsible for obtaining a construction NPDES permit for the project. The permit will require the development and submittal of an erosion and sediment control plan, groundwater protection plan, and stormwater and pollution prevention plan to the WV Department of Environmental Protection.
76	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
77	The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
78	The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
79	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
80	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO’s preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.

	The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
81	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
82	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
83	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
84	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
85	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
86	This is out of the scope of the Greenbag Road improvements, but the comment is noted.
87	This is out of the scope of the Greenbag Road improvements, but the comment is noted.
88	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. Please refer to the EA which evaluates the potential impacts of multiple alternatives on the surrounding area and recommends the preferred alternative as meeting the purpose and need.
89	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.

90	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
91	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
92	We appreciate your input regarding the project. All comments are reviewed and considered and, regardless of how they are received, all comments carry equal weight.
93	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
94	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
95	The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
96	Delineated means to identify the boundaries of an area.
97	The EA was complete and approved by the FHWA. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and

	consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
98	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
99	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
100	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
Comment Number	Comment Response
101	The studies were completed under the direction of the WVDOH. Traffic and engineering studies were conducted by Stahl Sheaffer Engineering and environmental studies and surveys were conducted by the Markosky Engineering Group and the WVDOH Environmental section. State and federal agencies reviewed the resulting reports for the environmental studies.
102	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
103	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
104	The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
105	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community. During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is “leave a voicemail” option those would be transcribed.

106	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
107	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
108	The chat window was available on the project's public input website during the virtual public meeting on September 29, 2020 from 5 to 8 pm. Questions and comments entered in the chat window were visible to the presenters and are included in this comment summary.
109	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
110	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
111	This comment is noted.
112	This comment is noted.
113	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.

114	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
115	This comment is noted.
116	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
117	All questions and comments submitted during the public comment period are included in this comment summary with responses.
118	The options presented in the traffic study and Environmental Assessment represent feasible alternatives based on meeting the purpose and need of the project while factoring the topography, safety issues, constructability, and current land use. Stahl Sheaffer is under contract with the WVDOH to assess and develop these plans.
119	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
120	The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. The aquatic resources study is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
121	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
122	Questions that were answered during the virtual public meeting were addressed in real time.
123	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
124	The presentation was repeated at 5, 6, and 7 pm in order to provide multiple opportunities to hear the full presentation for folks unavailable at the earlier times.
125	The presentation was repeated at 5, 6, and 7 pm in order to provide multiple opportunities to hear the full presentation for folks unavailable at the earlier times.

126	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.
127	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
128	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
129	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.
130	The Federal Highway Administration is the responsible Federal agency for the project and is reviewing all project documentation.
131	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is “leave a voicemail” option those would be transcribed. Any questions would be read, and comments would become part of the project record.
132	The public comment period extended from September 29 through November 30, 2020. Comments could be submitted via the online submittal system, emailed or mailed to the WVDOH.
133	This comment was addressed directly with the commenter during the public meeting.
134	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
135	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some

	intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
136	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.
137	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
138	We appreciate your input regarding the project.
139	The nature of and impact to this parcel and its uses will be addressed during the acquisition of any necessary portion in a manner that fully addresses any displacement. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
140	All comments are weighted equally.
141	We appreciate your input regarding the project.
142	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
143	This comment is noted.

144	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
145	The presentation was repeated at 5, 6, and 7 pm in order to provide multiple opportunities to hear the full presentation for folks unavailable at the earlier times.
146	The presentation was repeated at 5, 6, and 7 pm in order to provide multiple opportunities to hear the full presentation for folks unavailable at the earlier times.
147	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
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150	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
151	This comment is noted.
152	We appreciate your input regarding the project. The project was elevated from a Categorical Exclusion to an Environmental Assessment as a result of the comments received through the April 2019 public involvement activities. Please refer to the EA which evaluates the potential impacts of multiple alternatives, including the ‘no build alternative’, on the surrounding area and recommends the preferred alternative as meeting the purpose and need.
153	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.

154	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
155	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
156	An eagle nest survey was conducted by the WVDOH Environmental Section in July 2019. No nests were identified in the project area.
157	Pictures could be submitted via email or hardcopy to the WVDOH.
158	The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address.
159	Coordination will occur with affected property owners during the right-of-way acquisition process. Those who hold a valid property interest in property that is acquired for the project will be compensated during the ROW acquisition phase.
160	This comment is noted.
161	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
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166	The inscribed circle diameter is the distance across the circle inscribed by the outer curb (or edge) of the circulatory roadway. The proposed Greenbag Road/Dorsey Avenue/Kingwood Pike roundabout is anticipated to provide an approximately 150-foot inscribed circle. The proposed Greenbag Road/Mississippi Avenue roundabout is anticipated to provide an approximately 200-foot inscribed circle. The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The West Virginia Division of Natural Resources and the US Fish and Wildlife Service both reviewed the project area. The WVDNR requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The USFWS reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required." Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
167	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road

	corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
168	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
169	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
170	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.

171	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
172	This comment is noted.
173	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
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175	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.
176	The expected completion date for the project is in 2023.
177	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the

	analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The proposed project includes construction of new sidewalks, which create safe facilities for all users of the corridor. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor.
178	The proposed budget has not yet been accepted.
179	This comment is noted.
180	We appreciate your input regarding the project. Photographs could be received through email or hardcopy mail.
181	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Sidewalks are included in both of the build alternatives considered.
182	Test comment from public meeting team

183	Test comment from public meeting team
184	Test comment from public meeting team
185	Test comment from public meeting team
186	This comment was addressed directly with the commenter during the public meeting.
187	The comment is noted.
188	We appreciate your input regarding the project.
189	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
190	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
191	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag Road are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at

	Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. One way to compare the size of a roundabout would be based on the roundabouts inscribed circle diameter. The inscribed circle diameter is the distance across the circle inscribed by the outer curb (or edge) of the circulatory roadway. The Mileground roundabout provides an approximately 190-foot inscribed circle diameter. The proposed Greenbag Road/Dorsey Avenue/Kingwood Pike roundabout is anticipated to provide an approximately 150-foot inscribed circle. The proposed Greenbag Road/Mississippi Avenue roundabout is anticipated to provide an approximately 200-foot inscribed circle.
192	The nature of and impact to this parcel and its uses will be addressed during the acquisition of any necessary portion in a manner that fully addresses any displacement. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
193	The posted speed limit along Greenbag Road within the study area is 40 mph. Automatic traffic recorder (ATR) counts were conducted on various segments of Greenbag Road throughout the study area. The ATR counts recorded the 85th percentile speeds, which is the speed at or below which 85 percent of the motorists drive. The recorded speeds obtained during the September 2018 – October 2018 counts indicate that most traffic is traveling at or below 45 mph. It is anticipated that a reduction of the posted speed limit to 35 mph would have minimal impact to the current traveling speeds along Greenbag Road. The Greenbag Road improvements are designed to improve the east-west travel corridor. The roundabouts are designed to slow down traffic, because driver must slow down to yield to traffic before entering a roundabout from every approach. The reduction in speed results in a decrease of crash severity and injury.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey Avenue/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation, which is WVDOH design year criteria/threshold. The overall intersection would operate at an unacceptable LOS (LOS E). Traffic analyses were also completed at the intersection of Greenbag Road/ Dorsey Avenue/Kingwood Pike assuming left turn and right turn lanes on all approaches to the intersection, as well as traffic signal improvements to provide protected/permissive left turn phases for all left turns and right turn overlap phases for all right turns. This option does not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike and this option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabout has been designed with larger vehicles in mind and incorporates truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs are involved with a roundabout. If a power outage were to occur in the area, the roundabout will continue to function properly without the need of police involvement to direct traffic. Apolla Drive intersection with Dorsey Avenue was not included in the study, but based on review of aerial images, Apolla Drive’s intersection with Dorsey Avenue is approximately 1,130 feet north of Greenbag Road. A review of the queuing analyses completed for all options do not

	forecast queues for the southbound Dorsey Avenue approach to Greenbag Road to extend greater than 500 feet. With the proposed roundabout, queues are forecasted to not exceed 275 feet. In addition, review of aerial images shows that Apolla Drive provides a connection between Dorsey Avenue and Richard Avenue. The comment suggests that traffic flow through Apolla Drive will be greater with the recommended improvements at the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike, because thru-traffic currently occurs on Apolla Drive. The traffic study did not obtain or analyze Apolla Drive cut through traffic; however, it is theorized that this behavior is happening today due to the significant delays and queues currently occurring at the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike. With installation of the recommended roundabout, the intersection is forecasted to significantly improve traffic capacity and delays. Therefore, it is theorized that Apolla Drive may see a reduction in cut through traffic since traffic on Greenbag Road can be accommodated through the improved intersection. The operations and traffic flow along Don Knotts Boulevard/Route 119 were not included in the scope of study and therefore were not analyzed. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
194	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
195	Apolla Drive is beyond the scope of the current project.
196	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
197	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
198	One benefit of the installation of roundabouts is that roundabouts are designed to slow speeds in the approach and through the roundabout.
199	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
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	consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.
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	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
203	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
204	The timeframe of construction is currently unknown at this time, since the improvement plans are in preliminary design. However, it is anticipated that access to the prison will be maintained during construction.
205	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delay during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The traffic analysis has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The traffic analysis determined that the intersection of Greenbag Road/Mississippi Avenue would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with the installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions. Likewise, the traffic analysis determined that the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike would also operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design

	year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout, the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Roundabouts help reduce the likelihood and severity of collisions. Conventional 4-way intersection has 32 points of vehicle conflict due to the different vehicular maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
206	The design of the Mileground Roundabout is beyond the scope of the current project. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
207	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
208	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA.

	This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
209	No residences would be displaced by the roundabout options.
210	The posted speed limit along Greenbag Road within the study area is 40 mph. Automatic traffic recorder (ATR) counts were conducted on various segments of Greenbag Road throughout the study area. The ATR counts recorded the 85th percentile speeds, which is the speed at or below which 85 percent of the motorists drive. The recorded speeds obtained during the September 2018 – October 2018 counts indicate that most traffic is traveling at or below 45 mph. It is anticipated that a reduction of the posted speed limit to 35 mph would have minimal impact to the current traveling speeds along Greenbag Road. The Greenbag Road improvements are designed to improve the east-west travel corridor. The roundabouts are designed to slow down traffic, because driver must slow down to yield to traffic before entering a roundabout from every approach. The reduction in speed results in a decrease of crash severity and injury. The operations and traffic flow along Don Knotts Boulevard/Route 119 were not included in the scope of study and therefore were not analyzed. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. A roundabout may need a little more property within the actual intersection but will take up less space on the streets approaching the roundabout.
211	The additional right-of-way required for the non-roundabout options would result in displacement of residences in the northwest quadrant of Greenbag Road / Dorsey Avenue / Kingwood Pike.
212	The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
213	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts

	was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
214	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
215	It is anticipated that access to the prison will be maintained during construction. The Traffic Control plan will be developed during final design and input from prison staff will be coordinated.
216	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and

	consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
217	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
218	The WVDOH will coordinate with all utility companies within the project area to relocate any utility lines which would be impacted by the project construction.
219	The turn lane options that were examined (including Option E) do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). The operations and traffic flow along Don Knotts Boulevard/Route 119 were not included in the scope of study and therefore were not analyzed. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year.
220	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
221	The improvement to the level of service is calculated between the no build option and the selected alternative. Option F improves the level of service by three grade levels in the morning and afternoon time periods.
222	The Greenbag Road improvements are designed to improve the east-west travel corridor. The operations and traffic flow along Don Knotts Boulevard/Route 119 were not included in the scope of study and therefore were not analyzed. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year
223	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average

	reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences.
224	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.

225	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
226	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
227	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The diversion of traffic, including large trucks, from downtown is not within the scope of this project.
228	Changes to the interstate access in Morgantown are beyond the scope of the current project. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
229	The Greenbag Road improvements are designed to improve the east-west travel corridor. The diversion of traffic, including large trucks, from downtown is not within the scope of this project.
230	The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
231	The Greenbag Road improvements are designed to improve the east-west travel corridor. Construction is estimated to occur in 2022 and 2023. The posted speed limit along Greenbag Road within the study area is 40 mph. Automatic traffic recorder (ATR) counts were conducted on various segments of Greenbag Road throughout the study area. The ATR counts recorded the 85th percentile speeds, which is the speed at or below which 85 percent of the motorists drive. The recorded speeds obtained during the September 2018 – October 2018 counts indicate that

	most traffic is traveling at or below 45 mph. It is anticipated that a reduction of the posted speed limit to 35 mph would have minimal impact to the current traveling speeds along Greenbag Road. The preferred alternative is anticipated to require 1.5 to 2 construction seasons. The diversion of traffic from downtown is not within the scope of this project.
232	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
233	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
234	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
235	This comment is noted.
236	The comment is noted.
237	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The property owner associated with the community garden will be compensated for the sale of the land to the WVDOH during the right-of-way acquisition process. Impacts to the property were evaluated and have been minimized to the extent practicable. When only part of the property is required, as is the case with the referenced property, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. The additional right-of-way and/or easements required from this property is not expected to notably affect operations or result in a total take / displacement of the property.
238	The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. The West Virginia Division of Natural Resources and the US Fish and Wildlife Service both reviewed the project area. The WVDNR requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1

	and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The USFWS reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required."
239	The comment is noted.
240	Of the Mississippi Street options, Option C is the most expensive.
241	We appreciate your input regarding the project.
242	At this time the proposed retaining wall on the south side of Greenbag Road east of the roundabout is anticipated to be approximately 350 feet in length and 8 to 18 feet tall.
243	Alternative 2 Option F at Dorsey Avenue/Kingwood Pike is lower than Options D or E for the same corresponding options at the Mississippi Street intersection. The lowest cost alternative overall is Alternative 2, Option A (at Mississippi Street) and Option F (at Dorsey Avenue/Kingwood Pike.
244	The improvement to the level of service is calculated between the no build option and the selected alternative. Option F improves the level of service by three grade levels in the morning and afternoon time periods.
245	We appreciate your input regarding the project.
246	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
247	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include:

	Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
248	The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx
249	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
250	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons designed to support the weight and turning radius of larger vehicles, including school buses. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
251	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road

	traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
252	An in-person public meeting is not scheduled at this time. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic.
253	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
254	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
255	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
256	The comment is noted.
257	We appreciate your input regarding the project.
258	The chat window was available on the project's public input website during the virtual public meeting on September 29, 2020 from 5 to 8 pm.
259	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
260	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.

261	That is correct. A no-build alternative was also evaluated. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
262	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
263	This comment is noted.
264	The WVDOH has held two public meetings for the Greenbag Road Improvement project. The first meeting was held in April 2019 at South Middle School. This second public meeting was held virtually based on the public health concerns related to the COVID-19 pandemic. The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address. All questions and comments submitted during the public comment period are included in this comment summary with responses.
265	The chat window was available on the project's public input website during the virtual public meeting on September 29, 2020 from 5 to 8 pm.
266	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
267	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
268	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a “leave a voicemail” option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record.
269	The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road.
270	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on

	Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
271	The presentation was pre-recorded. The question and answer period was completed live during the virtual meeting.
272	The comment is noted.
273	Post construction surveys of roundabouts in Morgantown have not been conducted. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on

	Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
274	The estimated construction cost for the Preferred Alternative with Intersection options C at Mississippi Street and F at Dorsey Avenue/Kingwood Pike is $10,429,195.49. Funding for the project will include both State and Federal highway funds.
275	The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic. The virtual public meeting provided a presentation of the Environmental Assessment. There were multiple ways to submit comments and questions during the meeting and throughout the 60-day comment period that followed.
276	This comment was addressed directly with the commenter during the public meeting.
277	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
278	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year

	improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

279	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is "leave a voicemail" option those would be transcribed. Any questions would be read, and comments would become part of the project record.
280	The virtual public meeting took place from 5 to 8 pm on September 29, 2020. The presidential debate began at 9 pm.
281	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx
282	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
283	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
284	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Sidewalks are included in both of the build alternatives considered.
285	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
286	Any resources that may require reevaluation will be readdressed and any changes will be noted in the FONSI. Please refer to the EA Appendix for more information on the studies that have been conducted through project development (https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.).
287	The traffic control plan will continue to be revised during final design, and will not use Aaron’s Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
288	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from

	what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
289	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is "leave a voicemail" option those would be transcribed. Any questions would be read, and comments would become part of the project record.
290	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

	with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
291	The West Virginia Division of Natural Resources and the US Fish and Wildlife Service both reviewed the project area and there were no endangered falcons identified within the project area. The WVDNR requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The USFWS reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required." The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects in accordance with NEPA. Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
292	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
293	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
294	The comment is noted.
295	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
296	The Environmental Assessment was approved by Federal Highway Administration on August 28, 2020.
297	The Environmental Assessment was approved by Federal Highway Administration on August 28, 2020.

298	This comment is noted.
299	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
300	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
301	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
302	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not

	achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Sidewalks are included in both of the build alternatives considered. The WVDOH developed this project based on recommendations from the preliminary study that was completed by the MMMPO and documented in the Greenbag Road Corridor Study. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility.
303	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
304	We appreciate your input regarding the project.
305	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
306	We appreciate your input regarding the project.
307	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further

	archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed.
308	The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address. Written comments submitted following the April 2019 public meeting were included in the final Environmental Assessment, approved by FHWA on August 28, 2020. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage. Drainage issues within the project footprint will be further evaluated and addressed during final design for the project. Access to your property will be maintained during and after construction. The WVDOH will coordinate with all utility companies within the project area to relocate any utility lines which would be impacted by the project construction. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowner and will be compensated at fair market value of the part taken, plus damages, if any, to the residue, less all benefits. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.
309	There was a list of frequently asked questions with WVDOH responses on the website as well. The public was also informed during the public meeting that there would be a meeting summary included in the final environmental document.

310	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties. Opportunities for commenting were provided during the live public meeting, and after the meeting via the WVDOH website, email or by mail to the WVDOH. The public comment period was available beginning on September 29 and ending on November 30, 2020.
311	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
312	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
313	The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address. The public comment period was extended from the standard 30-day period to 60 days in order to accommodate additional input by the community.
314	Federal regulations require that projects take into account any effects to cultural properties. The entire environmental study area for the proposed project was assessed in 2019 to evaluate the presence of cultural properties, and findings were documented in accordance with Section 106 of the National Historic Preservation Act. The Historic Structures survey identified 25 resources that are greater than 45 years old. Two resources were recommended as eligible for the National Register of Historic Places: The Campbell Farmhouse and the prison complex. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
315	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
316	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
317	The Environmental Assessment was approved by Federal Highway Administration (FHWA) on August 28, 2020.
318	This is the preferred option driven by the NEPA process. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
319	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet).
320	We appreciate your input regarding the project.
321	Post construction surveys of roundabouts in Morgantown have not been conducted. The Insurance Institute for Highway Safety (IIHS) and the Federal Highway Administration (FHWA) have conducted studies on the benefits and effectiveness of roundabouts. Please refer to the IIHS's roundabout page (https://www.iihs.org/topics/roundabouts) and the FHWA's Roundabouts: An Informational Guide (https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf) for more information. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are sometimes present. The roundabouts on Greenbag Road will be more intuitive for drivers.
322	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties. More information is available in the EA alternatives analysis section with the impacts tables. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
323	Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community.

324	Post construction surveys of roundabouts in Morgantown have not been conducted. The Insurance Institute for Highway Safety (IIHS) and the Federal Highway Administration (FHWA) have conducted studies on the benefits and effectiveness of roundabouts. Please refer to the IIHS's roundabout page (https://www.iihs.org/topics/roundabouts) and the FHWA's Roundabouts: An Informational Guide (https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf) for more information. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are sometimes present. The roundabouts on Greenbag Road will be more intuitive for drivers.
325	Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Roundabouts are also designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection.
326	The West Virginia Division of Natural Resources and the US Fish and Wildlife Service both reviewed the project area. The WVDNR requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The USFWS reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required." More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the

	existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
327	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
328	The comment is noted.
329	During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option those would be transcribed and included in the public record for the project.
330	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F).

	The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
331	There has not been any formal public polling. Public comment periods have been available following both of the public meetings.
332	The preferred alternative is anticipated to require 1.5 to 2 construction seasons.
333	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
334	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

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335	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Sidewalks are included in both of the build alternatives considered.
336	We appreciate your input regarding the project.
337	We appreciate your input regarding the project.
338	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties.
339	This comment is noted.
340	The improvement to the level of service is calculated between the no build option and the selected alternative. Option F improves the level of service by three grade levels in the morning and afternoon time periods.
341	We appreciate your input regarding the project.
342	The archaeological survey was conducted according to the guidelines published by the WV State Historic Preservation Office Guidelines for Phase I, II, and III Archaeological Investigations and Technical Reports. The survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
343	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated

	during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Sidewalks are included in both of the build alternatives considered. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
344	We appreciate your input regarding the project.
345	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
346	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Any signed detours will be evaluated during final design as well as upgrades to these routes.
347	We appreciate your input regarding the project.
348	WVDOH's discussion of the response provided during the discussion: I explained the process that we have followed to date and referred her to the FHWA guidelines for NEPA. Redactions in the historical reports were in following the SHPO guidelines. I told her to send us any additional comments that she may have and to use a FOIA request if she wanted a specific document. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures

	survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at the link listed above. The West Virginia Division of Natural Resources and the US Fish and Wildlife Service both reviewed the project area. The WVDNR requested a mussel survey if in-stream work is anticipated in Cobun Creek and a spawning waiver if work will occur between April 1 and June 30. WVDOH environmental staff completed mussel and eagle nest surveys on July 22, 2019. No mussels or eagle nests were observed within the Project area. The USFWS reviewed the Project and determined "this project is not likely to adversely affect the Indiana bat." The USFWS also states that "the proposed project … will not affect any known Northern Long Eared Bat (NLEB) hibernacula … and no conservation measures are required."
349	The Greenbag Road Improvement Project is part of Governor Justice's Roads to Prosperity Program. The WV Division of Highways developed this project based on recommendations from the preliminary study that was completed by the Morgantown Monongalia Metropolitan Planning Organization (MMMPO) and documented in the Greenbag Road Corridor Study (March 2015). Due to the time constraints, general comments were not read aloud during the virtual public meeting held on September 29, 2020 from 5 to 8 pm. However, all comments and questions will be made part of the public record and become part of the final environmental clearance document. Questions posed by the public were read and answered during the virtual public meeting in order to provide information regarding the project to the community. The Environmental Assessment considered all necessary elements and impacts of the project and was approved by the Federal Highway Administration on August 28, 2020. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
350	The chat window was available on the project's public input website during the virtual public meeting on September 29, 2020 from 5 to 8 pm. During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there was a "leave a voicemail" option to leave a message which would be transcribed. Any questions would be read, and comments would become part of the project record. The public comment period was extended to 60 days to allow additional time for commenting.
351	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. The public comment period extended from September 29 through November 30, 2020. Comments could be submitted via the online submittal system, emailed or mailed to the WVDOH. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.

	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road. At this time the proposed retaining wall on the south side of Greenbag Road east of the roundabout is anticipated to be approximately 350 feet in length and 8 to 18 feet tall. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage.
352	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.

	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
353	Changes to the interstate access in Morgantown are beyond the scope of the current project. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
354	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
355	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
356	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.

	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
357	We appreciate your input regarding the project.
358	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
359	As identified in this comment, speeding is a public concern on Luckey Lane. Luckey Lane is a narrow roadway, currently providing a variable width cartway between 17 to 19 feet for two-way traffic. Stop signs are present at the school exit only driveway and at Dorsey Avenue. As part of the preliminary design, Luckey Lane will accommodate two (2) 9-foot travel lanes, providing a total roadway width of 18-feet for two-way traffic, with curb and a 5-foot sidewalk along the northern side. Traffic calming measures to reduce speeding were not incorporated in the preliminary design. Traffic calming utilizes physical measures to reduce the negative impacts of motor vehicles/driver behavior. Potential measures to reduce speeds along roadways could include increased enforcement, signage, pavement markings, including installation of stop

	bars at stop sign locations, and speed humps/bumps. Thank you for enumerating these safety concerns. The WVDOH will examine these safety concerns as part of the final design.
360	1) Maintaining the existing alignment is not feasible given the topography and does not meet the project purpose and need. The re-alignment is to allow for the approach and exit slopes of Dorsey and Kingwood to be decreased (currently Kingwood Pike enters the intersection at -6.5%, the roundabout would flatten that to less than 2%) and to improve the approach angles. In the existing condition, the angle between Greenbag Road and Dorsey Avenue is 60° and in the proposed condition it is 74°, with close to 90° being ideal. 2) At this time there is a proposed retaining wall on the south side of Greenbag Road east of the roundabout (across from the former Atomic Grill). It is anticipated to be approximately 350 feet in length and 8 to 18 feet tall. 3) Table E-3 reports estimated construction costs for each combination of intersection improvements at Mississippi Street (A, B, or C) and the Dorsey Avenue / Kingwood Pike intersection (D, E, or F) under Alternative 1. Table E-4 reports estimated construction costs for each combination of intersection improvements at Mississippi Street and the Dorsey Avenue / Kingwood Pike intersection under Alternative 2. Alternative 1 with Intersection Options AD = $12,689,979.44 Alternative 2 with Intersection Options AD = $11,238,151,91 Alternative 1 with Intersection Options BD = $13,125,555.10 Alternative 2 with Intersection Options BD= $11,642,971.91 Alternative 1 with Intersection Options CD = $13,074,839.27 Alternative 2 with Intersection Options CD= $11,825,328.90 Alternative 1 with Intersection Options AE = $13,249,895.68 Alternative 2 with Intersection Options AE= $11,792,156.83 Alternative 1 with Intersection Options BE = $13,685,471.34 Alternative 2 with Intersection Options BE= $12,196,975.83 Alternative 1 with Intersection Options CE = $13,364,755.51 Alternative 2 with Intersection Options CE= $12,379,332.83 Alternative 1 with Intersection Options AF = $10,755,399.35 Alternative 2 with Intersection Options AF= $9,842,019.50 Alternative 1 with Intersection Options BF = $11,190,975.01 Alternative 2 with Intersection Options BF= $10,246,838.49 Alternative 1 with Intersection Options CF = $11,140,259.18 Alternative 2 with Intersection Options CF= $10,429,195.49 Funding for the project will include both State and Federal highway funds. Detailed information, including acreage impacts to various land cover types, associated with each alternative and intersection option, are provided in Tables 5-7 of the EA. Parcel ownership is publicly available and can be viewed on the Monongalia County parcel viewer (https://ags.agdmaps.com/wv/mon/). 4) Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. 5) The preliminary design files are not available for distribution at this time.
361	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection.

	- One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
362	The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.

	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
363	The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
364	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of

	service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
365	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The diversion of traffic from downtown, including large trucks, is not within the scope of this project. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
366	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average

	reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
367	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
368	The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
369	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
370	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.

	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. This will result in an improvement in intersection operations during inclement weather. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
371	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
372	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Drainage issues will be addressed within the project area.
373	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
374	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
375	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and

	carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
376	We appreciate your input regarding the project.
377	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
378	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the

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379	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
380	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.

	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Property owners will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts have been minimized to the extent practicable.
381	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
382	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and

	carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
383	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
384	We appreciate your input regarding the project.
385	We appreciate your input regarding the project.
386	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
387	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts

	were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONS Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
388	We appreciate your input regarding the project.
389	We appreciate your input regarding the project.
390	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

	The referenced property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
391	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.

392	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road. At this time the proposed retaining wall on the south side of Greenbag Road east of the roundabout is anticipated to be approximately 350 feet in length and 8 to 18 feet tall. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage.
393	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
394	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
395	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. .

396	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
397	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road. At this time the proposed retaining wall on the south side of Greenbag Road east of the roundabout is anticipated to be approximately 350 feet in length and 8 to 18 feet tall. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage.
398	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
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	traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
400	Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Traffic entering a roundabout on each approach does not need to have the same volume of traffic in order to function optimally. Each roundabout is designed and adapted to the context of its location. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
401	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
402	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
403	This comment is noted.
404	This comment is noted.
405	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.

406	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
407	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
408	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
409	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
410	We appreciate your input regarding the project.
411	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
412	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include:

	- Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
413	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
414	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection.
415	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
416	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.
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	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.
419	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62’ wheel base between steer axle and last trailer axle, including a 48’ trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH’s design year level of service criteria

	threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
420	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

421	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
422	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	- No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
423	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
424	We appreciate your input regarding the project.
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426	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
427	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is

	controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers.
428	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
429	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
430	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
431	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
432	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Parking garages are outside the scope of the current project.

433	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
434	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	- No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
435	We appreciate your input regarding the project.
436	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
437	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
438	We appreciate your input regarding the project.
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	challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
440	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of

	traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.
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	- One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
442	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
443	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible

	resources and that no further historic structures investigations were needed. The Morgantown Historic Landmarks Commission was notified of the project in a letter dated January 30, 2019. An email was received from the MHLC on February 13, 2019 stating that the boundaries of the project are outside MHLC jurisdiction and they did not have any comments. The correspondence is available in Appendix E of the Historic Structures Report.
444	Thank you for inquiring about the Greenbag Road Project, our project team looks forward to working with you. The Environmental Assessment (EA) was approved by Federal Highway Administration (FHWA) on August 28, 2020. The EA along with all the Virtual Public Meeting information can be found at: https://transportation.wv.gov/highways/engineering/comment/greenbagroadimprovementproject/Pages/default.aspx and https://www.publicinput.com/greenbag. If you have any questions about the Environmental Assessment or Engineering Design please contact our consultants Karen Reed at Markosky Engineering Group, Inc. (kreed@markosky.com) or Brian Hoffheins at Stahl Sheaffer Engineering (bhoffheins@sse-llc.com). If you are requesting a specific document you will need to submit a FOIA request. For any Right of Way questions please contact WVDOH District 4 Right of Way Agent, Raymond Tackett (Raymond.N.Tackett@wv.gov). Please submit comments on the project on or before October 29, 2020.
445	1. The West Virginia Division of Highways (WVDOH) does not “steal” property. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970). 2. Since 2006 the traffic volume on this road has increased requiring additional upgrades such as the current Greenbag Road Improvement Project. Additional right of way would be needed if widening were to occur as Mr. Kyle suggests. 3. The approved Environmental Assessment (EA) addresses the purpose and need due to traffic issues plus evaluates traffic noise impacts. No traffic noise impacts are identified. 4. Additional right of way is needed for a turn lane. The WVDOH and the Federal Highway Administration (FHWA) determined that an EA is the appropriate National Environmental Policy Act (NEPA) document for the Greenbag Road Project. 5. The EA was approved in the year 2020 using the current and most update data available. https://transportation.wv.gov/highways/engineering/comment/greenbagroadimprovementproject/Pages/default.aspx. 6. During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is “leave a voicemail” option those would be transcribed. Any questions would be read, and comments would become part of the project record. There was a list of frequently asked questions with WVDOH responses on the website as well. The public was also informed during the public meeting that there would be a meeting summary included in the final environmental document. 7. The US Post Office has the responsibility for certified mail return receipts. 8. Properties impacted will be compensated as described in Uniform Relocation Assistance and Real Property Acquisition Act (1970). 9. As indicated in our response to Concern #2, since 2006 the traffic volume on this road has increased requiring additional upgrades such as the current Greenbag Road Project. The WVDOH and FHWA extended the comment period from October 29, 2020 to November 30, 2020 to provide the public more time to comment on the Greenbag Road Environmental Assessment.
446	We appreciate your input regarding the project.
447	We appreciate your input regarding the project.

448	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet).
449	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
450	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. Moving the roundabout to the north into the former Atomic Grill location is not feasible given the topography and approach angles. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In the existing condition, the angle between Greenbag Road and Dorsey Avenue is 60° and in the proposed condition it is 74°, with closer to 90° being ideal.
451	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria

	threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Changes to the interstate are outside the scope of the current project.
452	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
453	Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. More information is available in the FONSI and EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project.

	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for

	the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.
454	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
455	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection.

	- One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
456	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
457	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.

458	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. A conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Roadway drainage issues will be addressed within the project area. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
459	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
460	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing

	intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
461	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any

	improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
462	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers.
463	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
464	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the

	US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
465	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
466	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have

	a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
467	The WVDOH and FHWA will make the final decision regarding the Greenbag Road Improvement Project following completion of the public comment period. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
468	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
469	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the

	Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
470	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Coordination with emergency services will occur during the finalization of the traffic control plan in final design.
471	We appreciate your input regarding the project.
472	We appreciate your input regarding the project.
473	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.

474	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
475	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
476	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
477	The diversion of traffic from downtown, including large trucks, is not within the scope of this project. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
478	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive

	multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
479	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
480	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk.
481	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
482	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.

	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
483	Changes to the interstate access in Morgantown are beyond the scope of the current project. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.
484	Thank you for enumerating the safety concerns and the crosswalk locations. The WVDOH will examine all safety concerns as part of the final design.
485	Thank you for enumerating the safety concerns and the crosswalk locations. The WVDOH will examine all safety concerns as part of the final design. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as

	traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island.
486	Thank you for enumerating the safety concerns and the crosswalk locations. The WVDOH will examine all safety concerns as part of the final design. A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
487	Thank you for enumerating the safety concerns and the crosswalk locations. The WVDOH will examine all safety concerns as part of the final design.
488	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
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	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Changes to the interstate are outside the scope of the current project. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
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492	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Sidewalks are included in both of the build alternatives considered. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
493	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Sidewalks are included in both of the build alternatives considered. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
494	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
495	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
496	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the

	intersections if improvements do not occur. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
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499	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
500	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
501	All comments received by the WVDOH have been included and considered during the analysis and development of the project. The public comment period extended from September 29 through November 30, 2020. Comments could be submitted via the online submittal system, emailed or mailed to the WVDOH.
502	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
503	This comment is noted.
504	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
505	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
506	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
507	All comments received via the online system are included as part of this project record and considered during the decision process.
508	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have

	a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
509	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
510	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
511	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
512	The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Changes to the interstate access in Morgantown are beyond the scope of the current project.
513	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
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516	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

517	This comment is noted.
518	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers.
519	All comments received by the WVDOH have been included and considered during the analysis and development of the project. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the

	analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
520	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
521	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
522	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
523	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
524	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
525	Drainage issues within the project footprint will be addressed by the project design. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary.
526	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
527	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
528	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various

	transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.
529	This comment is noted.
530	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
531	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk.
532	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during

	an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
533	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate

	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk.
534	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk.
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536	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design.
537	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
538	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
539	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
540	All comments received by the WVDOH have been included and considered during the analysis and development of the project. Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The EA was reviewed and approved by FHWA on August 28, 2020.
541	The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address. During the September 29, 2020 virtual public meeting, the WVDOH personnel mentioned during each presentation that live phone calls would not be taken. However, there is “leave a voicemail” option those would be transcribed. The online commenting period was available beginning on September 29 and ending on November 30, 2020 for a 60-day comment period as opposed to the standard 30-day comment period. Numbers of responses to WVDOH roadway projects vary based on the location within the state, and the type and scale of the project. The FHWA approved the use of a virtual public meeting based on the public health concerns related to the COVID-19 pandemic. Virtual public meetings have not been used by the WVDOH prior to the global pandemic therefore data to provide cost comparisons is not available. The virtual public meeting for the Greenbag Road project was the second meeting held virtually by the WVDOH. The public meeting was held from 5 to 8 pm while the presidential debate did not begin until 9 pm so there was no overlap between the two events.
542	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

	with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
543	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
544	There are no direct impacts anticipated for the residences on Dorsey Avenue as a result of Option F.

	The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
545	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.

	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
546	The EA analyzed potential impacts to social, cultural, natural, economic, and environmental resource factors. All impacts will be minimized to the extent practicable. Please refer to the EA and appendices for more information: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
547	This comment is noted.
548	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive

	multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA process is designed to include opportunity for landowners and public stakeholders to provide comment and feedback which is considered and included in the final decision process. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. The diversion of traffic, including truck traffic, from downtown is not within the scope of this project.
549	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.
550	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include:

	- Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.
551	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Parking issues in downtown Morgantown are beyond the scope of the current project.

552	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
553	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
554	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
555	The I-79 West Ridge location is outside the scope of the current project.
556	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

557	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
558	The West Virginia Division of Highways (WVDOH) does not "steal" property. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970).
559	The West Run bypass and airport are both outside the scope of the current project.
560	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.
561	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
562	This comment is noted.
563	This comment is noted.
564	This comment is noted.
565	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO’s preliminary studies and findings. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences.
566	The West Virginia Division of Highways does not “steal” property. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970).
567	All comments received during the public comment period are included as part of this project record. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970).
568	The West Virginia Division of Highways does not “steal” property. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970).

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
569	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The section of Greenbag Road west of Giant Eagle is outside the scope of the current project.
570	All comments received by the WVDOH have been included and considered during the analysis and development of the project. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
571	The West Virginia Division of Highways does not "steal" property. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970). The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
572	This comment is noted.

573	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
574	The comment is noted.
575	The diversion of traffic from downtown is not within the scope of this project.
576	The diversion of traffic from downtown is not within the scope of this project.
577	This comment is noted.
578	The diversion of traffic from downtown is not within the scope of this project. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62’ wheel base between steer axle and last trailer axle, including a 48’ trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
579	This comment is noted.
580	The WVDOH developed this project based on recommendations from the preliminary study that was completed by the MMMPO and documented in the Greenbag Road Corridor Study. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The Greenbag Road project is included in the Statewide Transportation Improvement Program available at: https://transportation.wv.gov/highways/Programming/STIP/Pages/default.aspx.
581	The MPO report was the basis for the start of the Greenbag Road project. Additional studies and analysis has been conducted to develop the alternatives. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the

	major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
582	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The EA details costs associated with each alternative and intersection option and is available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Construction costs for Option F (the roundabout) are lower than constructions costs for the turn lane options.
583	This comment is noted.
584	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during

	an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.
585	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year

	improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
586	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.

587	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
588	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The preferred alternative is anticipated to require 1.5 to 2 construction seasons.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
589	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
590	This comment is noted.
591	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the

	intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected). Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
592	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The analysis also factors the improvement to the level of service provided by the turn lane options and the roundabout option for both current conditions and design year 2048 predicted conditions. The turn lane options do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 or 3 residences (depending on the turn lane option selected).
593	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
594	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Drainage issues will be addressed within the project area. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
595	Drainage issues within the project footprint will be considered by the project design to improve drainage conditions.
596	Impacts to wetlands have already been identified. The aquatic resources study and the EA are available on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. During the final design all drainage design will be finalized and any changes to wetland impacts will be identified and included in the mitigation plan.
597	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
598	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
599	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
600	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
601	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.

	The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
602	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
603	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. Differences between Greenbag Road and the Mileground include the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
604	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
605	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Designs for the intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
606	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
607	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
608	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website
609	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
610	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.

611	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
612	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

613	Changes to the interstate access in Morgantown are beyond the scope of the current project.
614	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Changes to the interstate access in Morgantown are beyond the scope of the current project.
615	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. For more information about how to use a roundabout, please visit the WVDOH educational video available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w
616	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
617	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing

	drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Signage meeting WVDOH and the Federal Manual on Uniform Traffic Control Devices will be placed to assist drivers with navigating the roundabouts.
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621	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
622	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options.

623	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.

624	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
625	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
626	The traffic control plan will continue to be revised during final design, and will not use Aaron’s Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from

	what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
627	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
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629	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options.

	The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
630	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
631	We appreciate your input regarding the project.
632	The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.

	The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. The analysis included consideration for future traffic volumes. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
633	Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Traffic entering a roundabout on each approach does not need to have the same volume of traffic in order to function optimally. Each roundabout is designed and adapted to the context of its location. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
634	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.

635	The public comment period was extended to November 30, 2020. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx
636	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Moving the roundabout to the north into the former Atomic Grill location is not feasible given the topography and approach angles. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In the existing condition, the angle between Greenbag Road and Dorsey Avenue is 60° and in the proposed condition it is 74°, with closer to 90° being ideal. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

	with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
637	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way.

	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.

	In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
638	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
639	Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Crossing to the center of the roundabout is not recommended.
640	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design.
641	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Further connections of existing trails is beyond the scope of the current project.

642	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island.
643	Operations along Don Knotts Boulevard/Route 119 is not included in the scope of the current project. The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Extensions beyond the scope of this project can be considered during future planning.
644	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
645	We appreciate your input regarding the project.

646	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.
647	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Suncrest is outside the scope of the current project. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
648	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The project will meet all Clean Water Act and US Army Corps of Engineers requirements to minimize or mitigate for impacts to waterways. Drainage issues within the project footprint will be addressed by the project design, and further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as

	vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way.
649	The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Multiple options, including a no-build option, were considered during the initial traffic study and the preliminary design phase. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The options included in the EA analysis met the purpose and need for the project in a feasible manner. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
650	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. Projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. To address the current issues of congestion and lack of safe pedestrian use of the area, the WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

	The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations
651	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. More information is available in the FONSI and EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
652	The comment is noted.
653	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Extensions beyond the scope of this project can be considered during future planning.

654	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design.
655	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Extensions beyond the scope of this project can be considered during future planning.
656	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The traffic control plan will continue to be revised during final design, and will not use Aaron’s Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
657	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
658	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during

	an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970). Moving the roundabout to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
659	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
660	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

661	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
662	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The NEPA process was followed by the WVDOH and FHWA during development of the project. Initially the project was evaluated as a Categorical Exclusion but following the April 2019 public meeting, FHWA elevated the documentation to an Environmental Assessment. During the development of the EA multiple alternatives were evaluated for impacts to the project area. Public comments have been solicited following the April 2019 meeting and a second virtual meeting in September 2019. Both of these comment periods were extended beyond the traditional

	30 days to accommodate public commenters. The EA has been reviewed and approved by the FHWA with a finding of No Significant Impact, therefore, an EIS is not warranted.
663	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
664	The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
665	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be

	evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
666	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
667	Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
668	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
669	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
670	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
671	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing

	intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
672	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The potential for the proposed improvements to impact environmental justice communities was analyzed as part of the EA. Please refer to the EA and appendices for more information: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
673	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

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674	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.
675	The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the

	project study area. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan.
676	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The nature of and impact to this parcel and its uses will be addressed during the acquisition of any necessary portion in a manner that fully addresses any displacement. The community garden is located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.
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678	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA has been reviewed and approved by the FHWA with a finding of No Significant Impact, therefore, an EIS is not warranted.
679	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the

	existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.
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684	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. MG-2647 The Anderson House (referred to as the Dorsey Farm) was evaluated as not eligible for listing on the National Register of Historic Places as part of the Section 106 studies conducted for this project. The evaluation received concurrence from the WV State Historic Preservation Office (WV SHPO) and was not challenged by any of the four historical organizations who consulted on the project. The landowner has not been directly solicited by FHWA/WV DOH as a consulting party for this project under Section 106 of the NHPA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
685	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. MG-2647 The Anderson House (referred to as the Dorsey Farm) was evaluated as not eligible for listing on the National Register of Historic Places as part of the Section 106 studies conducted for this project. The evaluation received concurrence from the WV State Historic Preservation Office (WV SHPO) and was not challenged by any of the four historical organizations who consulted on the project. The landowner has not been directly solicited by FHWA/WV DOH as a consulting party for this project under Section 106 of the NHPA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The WVDOH complied with the public involvement requirements of the National Environmental Policy Act and Section 106 of the National Historic Preservation Act through the public meetings of April 16, 2019 and September 29, 2020.
686	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. MG-2647 The Anderson House (referred to as the Dorsey Farm) was evaluated as not eligible for listing on the National Register of Historic Places as part of the Section 106 studies conducted for this project. The evaluation received concurrence from the WV State Historic Preservation Office (WV SHPO) and was not challenged by any of the four historical organizations who consulted on the project. The landowner has not been directly solicited by FHWA/WV DOH as a consulting party for this project under Section 106 of the NHPA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The WVDOH complied with the public involvement requirements of the National Environmental Policy Act and Section 106 of the National Historic Preservation Act through the public meetings of April 16, 2019 and September 29, 2020.
687	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
688	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62’ wheel base between steer axle and last trailer axle, including a 48’ trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design

	year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
689	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
690	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Multiple options were considered during the initial traffic study and the preliminary design phase. The options included in the EA analysis met the purpose and need for the project in a feasible manner.
691	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
692	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not

	achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
693	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.

	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The preferred alternative is anticipated to require 1.5 to 2 construction seasons.
694	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall

	intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
695	We appreciate your input regarding the project.
696	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
697	We appreciate your input regarding the project.
698	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
699	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the

	confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
700	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
Comment Number	Comment Response
701	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA.

	This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
702	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Crossing to the center of the roundabout is not recommended.
703	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

704	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
705	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.

	The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
706	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
707	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.

	The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
708	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the

	existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
709	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
710	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The detour of

	Greenbag Road during construction will be temporary. A maintenance of traffic plan will be in place to minimize delays, maintain access to residences and businesses, and maintain safety for travelers and construction workers.
711	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Trucks and large vehicles are being considered in the development of the traffic control plan. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The preferred alternative is anticipated to require 1.5 to 2 construction seasons.

712	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.

	Trucks and large vehicles are being considered in the development of the traffic control plan. The traffic control plan will continue to be revised during final design and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
713	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

714	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
715	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

	The table on page 239 of the PDF of the EA lists the hydric soils identified in the project area as listed on the NRCS State Soil Data Access Hydric Soils List. The Clarksburg soil series (CkC and CkB) are listed as hydric in Monongalia County. The Monongahela soil series is also listed as hydric in Monongalia County. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The turn lane option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. Indirect and cumulative effects were analyzed as part of the development of the EA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
716	The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an

	unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. In regards to safety, a conventional 4-way intersection has 32 points of vehicle conflict due to vehicular maneuvers through the intersection. A roundabout has 8 points of vehicle conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Crossing to the center of the roundabout is not recommended. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
717	The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are sometimes present. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has examined two build alternatives and three options for each of the major intersections. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
718	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

719	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The WVDOH has produced an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
720	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. The property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
721	We appreciate your input regarding the project. Changes to the interstate access in Morgantown are beyond the scope of the current project.
722	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). The design speed of 35 mph was not considered during the Greenbag Road PIE Traffic Study. The posted speed limit along Greenbag Road within the study area is 40 mph. Automatic traffic recorder (ATR) counts were conducted on various segments of Greenbag Road throughout the study area. The ATR counts recorded the 85th percentile speeds, which is the speed at or below which 85 percent of the motorists drive.

	The recorded speeds obtained during the September 2018 – October 2018 counts indicate that most traffic is traveling at or below 45 mph. It is anticipated that a reduction of the posted speed limit to 35 mph would have minimal impact to the current traveling speeds along Greenbag Road. The turn lane options that were examined do not improve the level of service as much as the roundabout at the intersection of Dorsey Avenue/Kingwood Pike. In addition, the turn lane option involves complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

723	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
724	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F).

	The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
725	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan will continue to be revised during final design and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection.

	One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
726	We appreciate your input regarding the project.
727	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The traffic control plan will continue to be revised during final design, and will not use Aaron’s Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout.

728	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
729	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average

	reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
730	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
731	The diversion of traffic from downtown, including large trucks, is not within the scope of this project. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62’ wheel base between steer axle and last trailer axle, including a 48’ trailer. Larger trucks can navigate the roundabout and use the internal truck apron. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include:

	Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
732	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of

	truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
733	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal

	Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. The use of crossing guards is outside the scope of the WVDOH.
734	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

735	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
736	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
737	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The virtual meeting was advertised in the WV legal ads, on a message board in the project area, and through the Morgantown Monongalia MPO. Emails were sent to all commenters from the April 2019 meeting who had provided a valid email address and postcards were mailed to all commenters from the April 2019 meeting who had provided a complete mailing address.
738	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour

	is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Coordination with emergency services will occur during the finalization of the traffic control plan in final design. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
739	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.
740	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing

	intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
741	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.

	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
742	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.
743	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
744	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
745	The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of

	the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.
746	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
747	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
748	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated

	during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
749	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal

	Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. The use of crossing guards is outside the scope of the WVDOH.
750	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have

	a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout
751	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The diversion of traffic from downtown, including large trucks, is not within the scope of this project. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The roundabout at the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike (Option F) has a lower construction cost than either of the turn lane options (Options D and E).
752	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Crossing to the center of the roundabout is not recommended.

753	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilized as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
754	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to

	have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
755	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.
756	We appreciate your input regarding the project.
757	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
758	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
759	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate

	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
760	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. All of the proposed sidewalks within the project area have a width of 5 feet. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
761	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.

762	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Drainage issues within the project footprint will be addressed by the project design. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The diversion of traffic from downtown, including large trucks, is not within the scope of this project. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
763	We appreciate your input regarding the project.
764	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the

	existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
765	As stated in the WVDOH Design Directive 506, the WVDOH adheres to the regulations of the WV Department of Environmental Protection and the Clean Water Act Section 402. The WVDOH does not have legal authority to regulate post construction storm water management beyond state right-of-way. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and

	meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. Improvements beyond the scope of this project can be considered during future planning.
766	The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are sometimes present. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. Estimated construction costs have been reviewed for each of the alternatives and options. The roundabout option at Dorsey Avenue (F) represents the least expensive of the estimates.
767	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall

	intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
768	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.

	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. In regards to cost, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
769	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout

	pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.
770	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.
771	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for

	the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
772	Test comment from public meeting team
773	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate

	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

	The diversion of traffic from downtown, including large trucks, is not within the scope of this project. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Moving the roundabout to the north into the former Atomic Grill location to avoid impacts to the referenced property is not feasible given the topography and approach angles. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

774	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
775	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.
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778	The comment is noted.
779	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.
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	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
781	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection

	crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
782	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
783	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. Connections of existing trails is beyond the scope of the current project. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
784	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
785	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
786	Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
787	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
788	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate

	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Pedestrian accommodations will be evaluated through final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
789	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.

	Active transportation accommodations will be evaluated through final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
790	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not

	achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
791	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Active transportation accommodations will be evaluated through final design. Extensions beyond the scope of this project can be considered during future planning. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
792	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic study, as well as traffic signal and roundabout options. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
793	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design

	year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
794	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall

	intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
795	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop

	controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
796	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
797	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
798	One of the major differences between Greenbag Road and the Mileground is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
799	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
800	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during

	future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. Active transportation accommodations will be evaluated through final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
801	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations

802	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed pedestrian hybrid beacon. The WVDOH will examine all safety concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
803	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn

	lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Changes to the interstate access in Morgantown are beyond the scope of the current project. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
804	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

805	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible

	resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at the link listed above.
806	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures

	survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
807	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Active transportation accommodations will be evaluated through final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
808	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Active transportation accommodations will be evaluated through final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.

809	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. More information is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at the link listed above. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be

	developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
810	Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all

	stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the

	overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
811	Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all

	stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the

	overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an unacceptable level of service (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.
812	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
813	The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair

	market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. More information is available in the FONSI and EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
814	The table on page 239 of the PDF of the EA lists the hydric soils identified in the project area as listed on the NRCS State Soil Data Access Hydric Soils List. The Clarksburg soil series (CkC and CkB) are listed as hydric in Monongalia County. The Monongahela soil series is also listed as hydric in Monongalia County. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way.
815	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
816	Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The aquatic resources study was conducted based on the guiding manuals for wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option

	B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F.

	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. In Table 5 the reference to Table 2 should refer to Table 6 for the Mississippi Street intersection and Table 7 for the Dorsey Avenue intersection. The EA has only one Appendix A however the individual resource reports that are attached as appendices also have attachments which begin with Appendix A. Any reference within the EA text to Appendix A is referring to the Public Meeting Summary. All project updates that have occurred since the development and approval of the EA are documented in the FONSI.
817	Thank you for enumerating the safety concerns. The WVDOH will examine all safety concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. All roadway crossings will be marked and signed as crosswalks. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers including older drivers as well as

	pedestrians and cyclists. Crosswalks are included in the design for all 4 roadways entering the roundabout at Greenbag Road and Dorsey Avenue/Kingwood Pike. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
818	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection, the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.
819	This comment is noted.
820	The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. Minimizing impacts to the environment, community, and right-of-way were also considered when evaluating the project alternatives.

	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts, under existing and future traffic conditions. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.
821	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
822	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
823	Written comments submitted following the April 2019 public meeting were included in the final Environmental Assessment, approved by FHWA on August 28, 2020. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
824	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The WVDOH will examine all safety and active transportation accommodation concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.

825	The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects. The Secondary and Cumulative Impacts analysis was included as an appendix to the EA and describes area growth and development trends that are projected to occur whether or not the proposed roadway improvements are constructed. The proposed project will redesign Greenbag Road to operate at an acceptable level of service as these current growth and development trends continue. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Environmental impacts associated with current and projected growth and development are outside the scope of this project. Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The noise analysis report indicates the Greenbag Road and intersection improvements for this alternative do not meet the requirements for either a Type I or Type II project. The Project is classified as a Type III project and a detailed noise analysis for highway traffic noise impacts was not required. The Type III noise analysis is available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach.
826	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The WVDOH will examine all safety and active transportation accommodation concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection

	crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
827	The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. The WVDOH will examine all safety and active transportation accommodation concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
828	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
829	Drainage issues within the project footprint will be addressed by the project design.
830	The safe mobility and needs of all users of the Greenbag Road corridor and other facilities within the project area were considered and incorporated in the proposed improvements through project development. Please refer to the EA and appendices for more information (https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx).
831	The diversion of traffic from downtown, including large trucks, is not within the scope of this project. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year

	improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
832	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk.

	Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
833	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location.
834	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the

	Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
835	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.

	During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
836	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
837	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

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838	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

839	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. The aquatic resources study was conducted based on the guiding manuals for

	wetland and stream identification. The wetland study adhered to the USACE Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. The stream identification and classification was based on the definitions from Title 46 and the West Virginia Surface Mining Rules. The study identified and delineated 8 palustrine wetlands and 13 jurisdictional watercourses within the project study area. Any changes to aquatic resource impacts in final design will be identified and included in the mitigation plan. The EA identifies wetland impacts for each alternative analyzed. Wetland impacts for alternative 1 are 0.06 acres (Palustrine Emergent 0.01 acres and Palustrine Forested 0.05 acres) and 0.05 acres for Alternative 2 (Palustrine Emergent 0.01 acres and Palustrine Forested 0.04 acres). Wetland impacts were additionally calculated for each of the intersection options: Option A is 0.05 acres (Palustrine Emergent), Option B is 0.05 acres (Palustrine Emergent) and Option C is 0.05 acres (Palustrine Emergent). No wetland impacts were identified for Options D, E, and F. The EA for the project identifies the intermittent and permanent stream impacts for each alternative analyzed. The stream impacts were determined for the EA based on the limit of disturbance provided and did not include culverted, relocated or stream loss lengths. The type of intermittent and permanent stream impacts identified for each alternative are similar. The total stream impacts for Option A is 500 LF and Options B and C are 521 LF. The total stream impacts for Option D is 428 LF, Option B is 433 LF and Option C is 453 LF. The level of detail to determine the type of stream impact including culverted, relocated, and stream loss, for the preferred alternative will be further analyzed in Final design. Options to further reduce impacts to the streams for the preferred alternative will need to be considered during Final Design. The analysis for water quality and quantity will also be further analyzed during Final Design. A detailed stream assessment will also be performed for the streams that will be impacted for the preferred alternative. Coordination with the DEP and the USACE will occur in final design and the applicable waterway permit will be obtained for the project. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and

	meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way.
840	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The turn lane options that were examined do not improve the level of service as much as the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to jurisdictional waterways. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way.

841	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
842	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate

	bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon crosswalk. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
843	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during

	future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
844	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and

	consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
845	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.
846	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning. Thank you for enumerating the safety concerns and the proposed HAWK beacon. The WVDOH will examine all safety concerns as part of the final design. Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
847	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. A mid-block crossing to connect the north and south sides of Greenbag Road in the vicinity of Mountaineer Mall can be examined during the final design phase.
848	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The evaluation of existing roadway conditions, including the existing roadway conditions of Kingwood Pike, was not part of the preliminary investigation and engineering traffic study. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring.

	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
849	The design speed of 35 mph was not considered during the Greenbag Road PIE Traffic Study. The posted speed limit along Greenbag Road within the study area is 40 mph. Automatic traffic recorder (ATR) counts were conducted on various segments of Greenbag Road throughout the study area. The ATR counts recorded the 85th percentile speeds, which is the speed at or below which 85 percent of the motorists drive. The recorded speeds obtained during the September 2018 – October 2018 counts indicate that most traffic is traveling at or below 45 mph. It is anticipated that a reduction of the posted speed limit to 35 mph would have minimal impact to the current traveling speeds along Greenbag Road. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. A mid-block crossing to connect the north and south sides of Greenbag Road in the vicinity of Mountaineer Mall can be examined during the final design phase.
850	The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be

	developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
851	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
852	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
853	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
854	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
855	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

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856	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The final decision for the project will be made by the WVDOH and FHWA. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
857	We appreciate your input regarding the project.
858	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year

	improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light “to beat” – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to “beat the light”, like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Pedestrians should use the dedicated crosswalks when safely crossing the roundabouts, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions.

	In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
859	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. During final design, further avoidance and/or minimization measures will be considered and/or implemented as appropriate to reduce the total impacts to streams. Specific Best Management Practices will be developed prior to construction to reduce the amount of disturbed aquatic habitat and riparian vegetation; minimize opportunities for increased sedimentation during construction; revegetate all disturbed areas to prevent accelerated erosion; designate equipment fueling and service areas away from aquatic habitats; and designate and construct all stormwater management facilities to prevent runoff. Coordination with resource agencies will continue throughout construction activities as necessary. The stormwater management plan for this project will meet the volume and rate requirements of the Morgantown Utility Board and WVDOH policies. Due to the existing topography and features it is likely that these requirements will require basins and other stormwater BMP's, such as vegetated swales. The amount of offsite runoff to the streams and wetlands will be minimized where practicable in order to limit basin size and meet the design criteria. Stormwater design for the project will be completed during final design and will minimize the impacts to the streams and wetlands located within and adjacent to the project right of way. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. The cultural resources reports are available as an Appendix to the EA on the WVDOH website at https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.

860	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
861	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Every roundabout is designed and adapted to the context of its location.
862	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does.

	Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. The WVDOH has an educational video on how to use a roundabout available for viewing at https://www.youtube.com/watch?v=7njH4MKyo0w.
863	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.

	Long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout.
864	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
865	The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection

	operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
866	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
867	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In

	addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
868	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing

	traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
869	We appreciate your input regarding the project. The WVDOH will examine all safety concerns as part of the final design.
870	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing

	intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. .Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
871	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

872	We appreciate your input regarding the project.
873	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury.

	- No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
874	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
875	We appreciate your input regarding the project. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal

	transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
876	We appreciate your input regarding the project.
877	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. A traffic study was completed in 2018 to determine the current conditions and provide data for estimates of future conditions. The study showed that the current level of service for the Dorsey Avenue/Kingwood Pike intersection to be C in both morning and evening and for Mississippi Street a C in the morning and an A in the evening. The study used a forecasted growth rate of 1.16% per year provided by the MMMPO to create projections for the design year (2048) levels of service. Forecasted 2048 level of service for the Dorsey Avenue/Kingwood Pike intersection is C in morning and F in evening and for Mississippi Street an F in the morning and a D in the evening indicating that as the Morgantown area continues to grow the traffic congestion at these intersections will increase as well. Increased congestion leads to longer travel times and more opportunities for safety incidents and serious injuries.
878	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the

	intersections if improvements do not occur. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
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883	Thank you for enumerating the safety concerns. The WVDOH will examine all safety concerns as part of the final design. The proposed project includes construction of new sidewalks, which create safe facilities for all users of the corridor. The project will be constructed in compliance with the Americans with Disabilities Act. All roadway crossings will be marked and signed as crosswalks. Roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the

	number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists.
884	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron.
885	The designs for the roadway and intersection improvements have factored the topography, safety issues, constructability, and current land use to develop feasible alternatives. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. The existing grade on Kingwood Pike requires stopping on a -6.5% grade at the traffic signal. The grade approaching the roundabout includes a flat grade of less than 2% at the roundabout. In most cases, the roundabout will not require approaching traffic to come to a full or immediate stop, and does not queue traffic on the steep grade as the existing traffic signal does. The preferred alternative includes the construction of another retaining wall at the intersection of Kingwood Pike and Greenbag Road. At this time the proposed retaining wall on the south side of Greenbag Road east of the roundabout is anticipated to be approximately 350 feet in length and 8 to 18 feet tall. The final design will factor the geotechnical information needed to design the retaining wall and prevent further damage.
886	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences. The diversion of traffic from downtown, including large trucks, is not within the scope of this project. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The scenarios determined to be

	evaluated in the traffic study evolved from the outcome of the MMMPO's preliminary studies and findings. Existing two-way stop controlled operations with potential roadway improvements were evaluated as part of the traffic, as well as traffic signal and roundabout options. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations.
887	We appreciate your input regarding the project. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
888	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
889	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). Extensions beyond the scope of this project can be considered during future planning.

890	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet). In regards to cost, since the traffic analysis determined that left turn lanes on Greenbag Road did not meet WVDOH's LOS criteria, a cost estimate was not prepared. However, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance are involved with a roundabout. The diversion of traffic, including large truck traffic, is not within the scope of this project. The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62' wheel base between steer axle and last trailer axle, including a 48' trailer. Larger trucks can navigate the roundabout and use the internal truck apron. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.

891	Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
892	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.

	The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way.

	Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. The sidewalk design has been extended from the western end of the project area along Greenbag Road to the Dorsey Avenue/Kingwood Pike intersection. At the intersection the sidewalk follows Dorsey Avenue north to Luckey Lane and east on Luckey Lane to the connection with the existing sidewalk at Mountainview Elementary School. The shoulder along the north side of Greenbag Road is being designed to accommodate bicycle use by being wider (3 feet) than the standard shoulder (2 feet).
893	We appreciate your input regarding the project. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.
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	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
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	Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits.

	West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
900	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. The future traffic along Greenbag Road, Mississippi Avenue, Dorsey Avenue, Kingwood Pike were projected for the future design year by assuming existing traffic distribution/patterns but with increased traffic volumes though application of a yearly traffic growth rate of 1.16% per year. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Moving the intersection to the north into the former Atomic Grill location is not feasible given the topography and approach angles.
901	The traffic control plan, which will outline the intended traffic detour tour, will continue to be revised during final design. It should be noted that Aaron's Creek Road will not be utilizes as a signed detour. The anticipated plan intends to utilize the center of the Dorsey Avenue /Kingwood Pike roundabout as a temporary intersection with temporary traffic signals during construction. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey Avenue/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the traffic signals to provide a protected/permissive left turn phase on Greenbag Road. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. It should be noted that LOS C is WVDOH's design year level of service criteria threshold for intersection improvements. The overall intersection would operate at an

	unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The need for a sidewalk was identified by the public in the comments for the MMMPO corridor study as one of the factors to improve safety in the Greenbag Road corridor. Pedestrians should use the dedicated crosswalks when safely crossing, just like crossing any other intersection. At a roundabout, pedestrian crosswalks will be placed to cross each roadway leg to the roundabout, which is the same as traditional intersection crossings. The roundabout pedestrian crosswalk placement allows pedestrians to cross one direction of traffic a time at each roundabout approach because of the splitter island. Pedestrians should also use the designated crosswalk locations. Crossing to the center of the roundabout is not recommended.
902	We appreciate your input regarding the project.
903	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the

	analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The roundabouts have been designed with larger vehicles in mind and incorporate truck aprons to support the weight and turning radius of larger vehicles, including school buses. In addition, roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different crossings and maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury. Lastly, long-term costs associated with roundabouts are significantly less than a traffic signal, since no electrical costs and no traffic signal maintenance costs are involved with a roundabout. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Traffic entering a roundabout on each approach does not need to have the same volume of traffic in order to function optimally. Each roundabout is designed and adapted to the context of its location.
904	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
905	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.

	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
906	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion.
907	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during

	an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. The hiring and placement of crossing guards falls outside of the purview of the WVDOH. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
908	We appreciate your input regarding the project.
909	We appreciate your input regarding the project.
910	We appreciate your understanding during the transition to the virtual meeting format and apologize for any technical difficulties. The Environmental Assessment and additional information can be found on the project website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
911	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection

	LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.
912	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.

913	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike is currently controlled by a traffic signal and not by a four-way (all-way) stop, which includes stop sign control on each approach. The intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations (traffic signal control) were to remain the same 30-years in the future (design year) without any improvements. Therefore, traffic analysis was not completed for a four-way (all-way) stop controlled intersection operations. The University Town Center Walmart parking lot is outside the scope of the current project.
914	We appreciate your input regarding the project.
915	The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design.

	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
916	We appreciate your input regarding the project.
917	We appreciate your input regarding the project.
918	Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
919	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have

	a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.

920	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. The WVDOH will examine all safety concerns including crossings of Greenbag Road as part of the final design.
921	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.

922	The archaeological survey was conducted according to the guidelines published by the WV State Historic Preservation Office Guidelines for Phase I, II, and III Archaeological Investigations and Technical Reports. The survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
923	One of the major differences between Greenbag Road and the Mileground, is the volume of traffic. Greenbag Road has less than half the traffic volume that Mileground has. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers.
924	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout.
925	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway.

	The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The Greenbag Road roundabouts have major differences to other existing roundabouts within Morgantown, including the Mileground. Greenbag Road has less than half the traffic volume of the Mileground. A second major difference is the general configuration of the roundabouts. The proposed roundabouts on Greenbag are more straightforward and more traditional roundabout designs, without all of the confusing lanes that are present at Mileground. The roundabouts on Greenbag Road will be more intuitive for drivers. Every roundabout is designed and adapted to the context of its location. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
926	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

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	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
928	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both

	exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
929	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
930	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria.
931	The preliminary investigation and engineering traffic study was completed to evaluate the Greenbag Road corridor, evaluating the existing and potential future operation of the intersections selected for study by WVDOH. The Greenbag Road corridor has long been recognized as a challenging roadway to navigate due to geometric deficiencies, significant intersection delays during the peak hours, and increased volume of truck traffic and development within the corridor. Several studies have been previously completed through the MMMPO, evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. It should be noted that the traffic evaluation was completed prior to the COVID-19 pandemic and its effects to traffic currently occurring. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified

	review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
932	This comment is noted.
933	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The option to add left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike was one of the options suggested by the MMMPO study and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The turn lane options that were examined in the EA do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI.
934	A roundabout may need a little more property within the actual intersection but will take up less space on the streets approaching the roundabout. Installation of the roundabout at the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike does not result in takes of any residences. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year

	improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Roundabouts help reduce the likelihood and severity of collisions. Studies by the Federal Highway Administration (FHWA) have shown that roundabouts typically achieve reduction in overall collisions, injury collisions, fatality collisions, and pedestrian collisions. Reasons for these reductions due to the installation of a roundabout include: - Low travel speeds – Drivers must slow down and yield to traffic before entering a roundabout. The reduction in speeds results in a decrease in crash severity and injury. - No traffic light "to beat" – The design of a roundabout promotes a continuous circular flow of traffic. Because of this design, drivers will not have the incentive to speed up to "beat the light", like they may at a traditional intersection. - One way travel – The design of a roundabout directs drivers through gently designed curves into a one-way counterclockwise circular path. This design eliminates the possibilities for T-bone and head-on collisions. In addition, a conventional 4-way intersection has 32 points of vehicle conflict due to the different maneuvers through the intersection. A roundabout has 8 points of conflict, which all occur in the same direction, reducing crash severity and likelihood of injury.
935	The WVDOH developed this project based on recommendations from the preliminary study that was completed by the MMMPO and documented in the Greenbag Road Corridor Study. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility.

936	We appreciate your input regarding the project.
937	Changes to the interstate access in Morgantown are beyond the scope of the current project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
938	The Environmental Assessment was approved by Federal Highway Administration on August 28, 2020. Any deficiencies will be re-assessed for potential impacts and any changes will be noted in the FONSI.
939	The traffic control plan will continue to be revised during final design, and will not use Aaron's Creek Road as a signed detour. The revised plan intends to utilize the center of the Dorsey/Kingwood roundabout as a temporary intersection with temporary traffic signals. A short-term detour is proposed using Summers School Road while constructing the connection of the existing Kingwood Pike with the new portion. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements.

	At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
940	The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA.
941	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.

	The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. At the intersection of Greenbag Road/Mississippi Avenue the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. The design year with improvements scenarios evaluated determined that with installation of a roundabout the overall intersection would operate at a LOS A, best operating conditions, for all peak hours studied. Installation of a traffic signal with turn lanes resulted in an overall intersection LOS B during the AM peak hour, with the Mississippi Avenue approach operating at a LOS C. Though the analysis meets WVDOH minimum LOS criteria, the roundabout option exceeds WVDOH minimum LOS criteria. Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection.
942	A shared-use path was part of some early versions of the project, but the right of way impacts along Bluegrass Village and the Kennedy Center were significant. Due to these detrimental impacts the shared use path was removed from the alternatives that were advanced to the EA. Extensions beyond the scope of this project can be considered during future planning.
943	The roundabouts were designed to accommodate AASHTO WB-62 truck configuration, which is an interstate semi-truck with a 62’ wheel base between steer axle and last trailer axle, including a 48’ trailer. Larger trucks can navigate the roundabout and use the internal truck apron.

944	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The preliminary investigation and engineering traffic study has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. WVDOH requires intersection improvements to meet or exceed an overall intersection LOS C or better during the peak hours studied for design year improvements. The times of day (peak hours) selected to be studied followed WVDOH guidelines and is standard traffic engineering practice for determining future intersection improvements. At the intersection of Greenbag Road/Dorsey Avenue/Kingwood Pike the traffic analysis determined that the intersection would operate at failure (overall intersection LOS F) if existing intersection conditions and operations were to remain the same 30-years in the future (design year) without any improvements. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E). In addition, the left turn lane option would result in the eastbound Greenbag Road traffic queue to extend past the Bluegrass Village Driveway. The traffic analysis determined that with installation of a roundabout the overall intersection would operate at a LOS C, meeting WVDOH design year criteria. The traffic data used for the development of the Options was based upon the traffic on the roadway in October of 2018. This data shows that 12%, or 1,300 heavy vehicles per day, are straight trucks and larger, therefore the S curves do not currently prevent the use by larger trucks. Road repair beyond the scope of this project is being addressed through the Governor's Roads to Prosperity program and progress can be tracked via the WVDOH website.
945	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur.
946	The proposed project includes improvements to an existing transportation facility and the construction of the project is not expected to stimulate secondary growth, affect land use decisions, or induce land use change. Therefore, the project is not expected to result in light pollution impacts that are significantly worse than conditions currently present within the project area. The lighting layout for the roundabout will be

	developed during final design. The lighting will be designed to attempt to minimize light pollution while maintaining FHWA and WVDOH standards and requirements for lighting of the roundabout.
947	Any property needed for the project will be acquired under the Uniform Relocation Assistance and Real Property Acquisition Act (1970) through negotiations with the landowners. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
948	The WVDOH developed this project based on recommendations from the preliminary study that was completed by the MMMPO and documented in the Greenbag Road Corridor Study. The MMMPO had completed several previous studies evaluating various transportation plans for the Greenbag Road corridor, with the ultimate vision of transforming Greenbag Road into a safe, efficient, and attractive multimodal transportation facility. All comments received by the WVDOH have been included and considered during the analysis and development of the project. All comments are reviewed and considered and, regardless of how they are received, all comments carry equal weight.
949	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to

	have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis.
950	Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
951	The EA analysis included evaluation of potential impacts to numerous categories including natural resources, cultural resources, land use, indirect, and cumulative effects in accordance with NEPA. Findings from the Environmental studies (aquatic resources such as streams and wetlands; rare, threatened and endangered species of plants and animals; floodplains; farmlands; groundwater; hazardous materials; air quality; and noise) that were conducted to evaluate impacts associated with the proposed project are documented in the EA. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel.

	Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
952	The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by "land already in or committed to urban development" as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines "market value" as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
953	The EA reviewed multiple alternatives including turn lanes, traffic lights, and the roundabouts. Through the analysis in the EA, the only alternative that meets the purpose and need of the project is the roundabout. The Environmental Assessment was approved by Federal Highway Administration on August 28, 2020.
954	The diversion of traffic from downtown, including large trucks, is not within the scope of this project.
955	The turn lane options that were examined do not improve the level of service as much as the roundabout and the turn lanes at Dorsey Avenue/Kingwood Pike involve complete takes of 2 residences and 1 business. These takes are different from what was reported in the EA. This change will be noted in the FONSI. Adding only left turn lanes on Greenbag Road at the Dorsey/Kingwood Pike intersection was evaluated during an initial round of traffic analysis because this option had been suggested by the MPO. The option included upgrading the signal lights to have a protected/permissive left turn phase. The analysis showed that this option would result in some intersection improvements but could not achieve LOS C or better for the overall intersection operation. The overall intersection would operate at an unacceptable LOS (LOS E or F). The eastbound Greenbag Road traffic queue would extend past the Bluegrass Village Driveway. Based on these findings this option was replaced with Options D and E for the EA analysis. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full

	amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase.
956	Roundabouts help reduce vehicular delay and promotes a continuous flow of traffic, which increases traffic capacity at an intersection. Traffic entering a roundabout on each approach does not need to have the same volume of traffic in order to function optimally. Each roundabout is designed and adapted to the context of its location.
957	Both the MMMPO corridor study and the 2018 traffic study determined that traffic flow through the corridor is controlled by the congestion at the major intersections in the corridor. The projected growth in the Morgantown area will continue to increase traffic and congestion at the intersections if improvements do not occur. The WVDOH has examined two build alternatives and three options for each of the major intersections. The intersection options that were evaluated and analyzed include turning lanes, traffic signals, and roundabouts. The evaluation and analysis of these intersection options indicate that the roundabout would provide the most improvement to traffic congestion, has the lowest estimated construction cost, and does not displace any residences.
958	Thank you for providing background information on the farm at 27 Kingwood Pike. The final design will factor the geotechnical information needed to design the retaining wall and prevent damage to the residence. The option proposed here was one of the options suggested by the MMMPO study (adding left turn lanes only on Greenbag Rd at the Dorsey/Kingwood Pike) and was included on the first round of traffic analysis submitted to the WVDOH in February of 2019. This scenario also included upgrading the existing 2-phase traffic signal to 3-phases to incorporate a protected/permissive left turn phase. Installation of the turn lanes and modifying the signal phasing resulted in various approach and overall intersection LOS improvements; however, LOS C or better for the overall intersection operation could not be achieved. It was projected that some movements and the overall intersection would operate at an unacceptable level of service (LOS E or F). During the PM peak hour, the overall intersection is projected to operate at an overall intersection LOS E, and the eastbound through movement is forecasted to operate at a LOS F. This option would result in the Greenbag Road and Dorsey Avenue approaches queue lengths increasing. The eastbound Greenbag Road through movement queue will continue to extend past the Bluegrass Village driveway. Based on these findings and at the direction of the WVDOH, the traffic analysis was revised using additional options, which developed into Options D and E examined for the EA. The left turn lane only on Greenbag Road was not developed further and no impacts were assessed for the EA. The traffic data used for the development of the Options was based upon the traffic on the roadway in October of 2018. This data shows that 12%, or 1,300 heavy vehicles per day, are straight trucks and larger. Roundabouts are designed to maintain a constant flow of traffic through the intersection which results in reduced congestion on roadways and a reduction in delays for drivers. Studies have shown that changing signalized intersections to roundabouts can have up to an 89% average reduction in vehicle delays. The improved traffic flow also results in

	reduced vehicle emissions including carbon monoxide, nitrous oxide, and carbon dioxide at the intersection. Additionally, roundabouts are designed to slow speeds in the approach and through the roundabout allowing drivers more response time and limiting the number of potential directions where traffic could approach. Both of these factors improve safety for all drivers, including older drivers as well as pedestrians, and cyclists. The cultural resources surveys were conducted according to the guidelines published by the WV State Historic Preservation Office. The archaeological survey included the excavation of 213 shovel test pits, one test excavation unit, and visual inspection of the entire surface area within the defined area of potential effect. Based on the SHPO guidelines, when no cultural resources are identified during the Phase I survey, an abbreviated technical report is acceptable. As the reviewing agency, the WV SHPO concurred with the recommendation that no further archaeological investigations were warranted and no archaeological historic properties are present in the study area. The historic structures survey resulted in the identification of 25 structures 45+ years old within the defined area of potential effect. Two of the resources were recommended eligible for the National Register of Historic Places and the project was designed to avoid potential impacts to these properties. As the reviewing agency, the WV SHPO concurred with the recommendation that the project would not adversely affect any NRHP eligible resources and that no further historic structures investigations were needed. More information is available in the EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx. The EA reported impacts to Federal Farmland Protection Policy Act (FPPA) soils. The entire Greenbag Road environmental study area is encompassed by “land already in or committed to urban development” as defined by the FPPA (see 7 CFR § 658.2 - Definitions) and is therefore not subject to provisions of FPPA. Please refer to the Farmland Appendix attached to the FONSI for further detail. LESA criteria are used under the FPPA. An FPPA review of the project shows that the entire project corridor is within land designated as urbanized area on the US Census Bureau Map and is considered land already in or committed to urban development by the act. Therefore, the Land Evaluation and Site Assessment is not applicable to this project. Conscious Harvest Cooperative Community Garden, Joy and Hemp Universal LLC, and Mockingbird Hill Farms are located on private property and the property owner will be compensated for the sale of any land to the WVDOH during the right-of-way acquisition process. Impacts to this parcel have been minimized to the extent practicable. Approximately 1.56 acres (67,900 square feet) will be required from the parcel. Fair market value will be paid for all properties that require full or partial acquisition as a result of the project. When only part of the property is required, as is the case with this parcel, fair market value of the part taken will be paid, plus damages, if any, to the residue, less all benefits. West Virginia law defines “market value” as the price a willing buyer would pay a willing seller, neither acting under compulsion nor duress, both exercising prudence and intelligent judgment as to its value and familiar with the purpose for which the property is reasonably available. Fair market value will be determined by a competent, professional real estate appraiser after a thorough inspection of the property, a comparison

	with similar properties in the area that have been sold recently, a determination and consideration of its replacement cost and depreciation and consideration of the income-producing potential. All appraisal reports are office-reviewed, then rechecked in the field by experienced, qualified review appraisers for accuracy. Since the Division of Highways has adopted a firm price policy, the property owner will be offered the full amount of the approved appraisal. There will be no attempt to buy property at less than fair market value. This policy guarantees that all citizens of the state receive full value for the money expended for highway rights of way. Those who hold a valid property interest in the property that is acquired for the project will be compensated during the ROW acquisition phase. More information is available in the FONSI and EA appendices. The EA and appendices are available on the WVDOH website: https://transportation.wv.gov/highways/engineering/comment/closed/greenbagroadimprovementproject/Pages/default.aspx.
959	Your comments of January 6, 2021 concerning the Greenbag Road Project U331-857-0.67 in Morgantown have been forwarded to the Engineering Division for a response. This project was identified in Governor Justices Roads to Prosperity program with the support of the Morgantown Monongalia Metropolitan Planning Organization and local officials. Your comments as well as many others received are being considered & will be made part of the project record. You indicate concerns with the condition of roads in the area. Please contact our District Four Office in Clarksburg at 304-326-0124. That office is responsible for maintenance of state- owned roads in Preston County as well as the Morgantown area. With respect to David Ervin's letter to the Dominion Post, "Proposed roundabout threatens historic home", the reference is to the Anderson House located at 27 Kingwood Pike. The Anderson House should not be acquired based on our preliminary project limits. In addition, the Anderson house has been evaluated for its historic significance & the West Virginia Historic Preservation Office has concurred with our recommendation that the Anderson residence is considered not eligible for inclusion in the National Register of Historic Places.



GREENBAG ROAD IMPROVEMENT PROJECT

Virtual Public Meeting

September 29, 2020

5—8 PM

Live presentations of information will be repeated at 5, 6, and 7 pm

All information will remain available throughout the comment period.

State Project U331-857-0.67
Federal Project STP-0857(019)D
Monongalia County, WV

U.S. Department of Transportation Federal Highway Administration

WVDOT

Join us on Tuesday, September 29, from 5:00 to 8:00 PM for a virtual public meeting to present the Environmental Assessment and receive your input for the selected preferred alternative.

WEB LINK: http://go.wv.gov/dotcomment

CALL IN: (855) 925-2801 (Access Code 9374)

TEXT: N606 to 73224

Full Environmental Assessment document is available on the WVDOH website

Comments are due by Thursday, Oct. 29, 2020 and can be submitted during the meeting, on the website (http://go.wv.gov/dotcomment) or mailed to:

Mr. RJ Scites, P.E.
Director, Engineering Division WVDOH
1334 Smith Street
Charleston, WV 25301

«AddressBlock»

FOR IMMEDIATE RELEASE
Thursday, November 5, 2020
CONTACT: WVDOTCommunications@wv.gov

Division of Highways extends comment period on Greenbag Road Improvement Project in Monongalia County

CHARLESTON, WV – At the request of the public, the West Virginia Division of Highways (WVDOH) has extended the comment period on the Greenbag Road Improvement Project in Monongalia County.

The comment period now closes on Monday, Nov. 30, 2020.

This project provides operational improvements along 1.65 miles of Greenbag Road (County Route 857) southeast of Morgantown. The purpose of the project is to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor.

Click here to access an online comment form on the project on the West Virginia Department of Transportation website. You can also submit a written comment to R.J. Scites, P.E., Director, Engineer Division, West Virginia Division of Highways, 1334 Smith Street, Charleston, WV 25301.

The West Virginia Department of Transportation asks you to please use caution when driving in work zones — **Just. Slow. Down. It's everybody's responsibility**. Drivers should download the WV 511 app for regular traffic and road work updates or go to the website at **https://link.edgepilot.com/s/a625ff92/sVivlJdq1EyfGxIOwSbVSQ?u=http://www.wv511.org/**. For information about the project, visit **Drive Forward WV** or the **WVDOT Facebook**.

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If you do not wish to receive messages from our office, please click the Unsubscribe link below for instant removal.

You are receiving this email because you opted in via our website.

Our mailing address is:
West Virginia Department of Transportation
1900 Kanawha Blvd E
Charleston, WV 25305-0009

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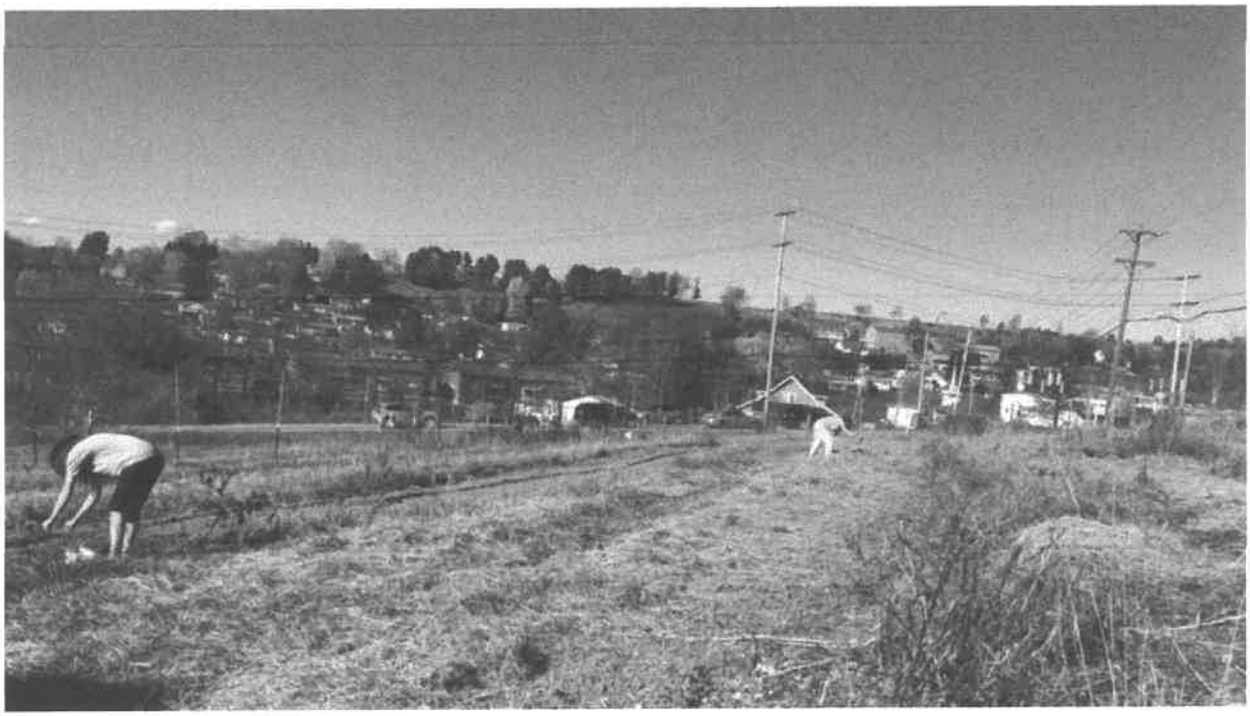
Recipient: West Virginia Department of Transportation, West Virginia Department of Highways, Jim Justice

Letter: Greetings,

Petition for Option G: A Community-Based Solution for Greenbag Road Improvement Project!

RECEIVED
DEC 02 2020
ENGINEERING
DIVISION

Petition for Option G: A Community-Based Solution for Greenbag Road Project!



Jennifer Hastings started this petition to West Virginia Department of Transportation and 2 others

This petition is to gather support for an alternative option to the Greenbag Road Improvement Project. We call this: Option G

It is a Community Based Solution to the existing alternatives.

The option preferred by ALL PARTIES, as listed below, combines dedicated left turn lanes for Greenbag Road (as in Option D) with the design features, but no added lanes for Dorsey Avenue and Kingwood Pike described in the Executive Summary of the EA.

These design features include widening traffic lanes, adding sidewalks on Dorsey Avenue, and adding a paved shoulder on Kingwood Pike. This new option would have numerous benefits. It would:

Improve the safety and access for motorized and non-motorized connections;
Reduce impacts to natural resources;
Preserve significantly more of the adjacent farmland of statewide importance;
Reduce the amount of impervious surface, causing fewer impacts to nearby streams and

wetlands;
Limit disturbance to unsuitable soils with a history of slips to prevent likelihood of property damage or loss;
Limit impacts to existing residences and businesses on Dorsey Avenue and Kingwood Pike and account for additional historic and cultural preservation;
Reduce construction costs.

The Concerned Parties and Interested Parties (The Landowners) , as listed below, unanimously support this "Option G ' as "preferred"

Concerned Parties:
Garret Richards, Landowner at the intersection of Greenbag Road / Kingwood Pike
Tommy Richards, Landowner at the intersection of Greenbag Road / Kingwood Pike
Mary Hastings, Landowner at the intersection of Greenbag Road / Kingwood Pike
Dewey Hastings, Landowner at the intersection of Greenbag Road / Kingwood Pike
Andy Pickering, Landowner at the intersection of Dorsey Avenue / Kingwood Pike
Grant Hastings, Landowner on Dorsey Avenue

Conscious Harvest Cooperative, 501(c)(3) - Business, intersection of Greenbag Road / Kingwood Pike
Joey James, Treasure / Jennifer Hastings, Secretary / Ted Hastings, Founding Member / Megan Govindan, President

Joy and Hemp Universal, LLC - Business, intersection of Greenbag Road / Kingwood Pike
Owners: Mary Hastings / Jennifer Hastings / Ted Hastings / Patrick Kyle

Mocking Bird Hill - Business, intersection of Greenbag Road / Kingwood Pike
Owner: Marlin Dehoff

Tong Thai Fresh, LLC - Business, intersection of Greenbag Road / Kingwood Pike
Owner: Shawn Komondor

Christopher Lazzell - Leasee, intersection of Greenbag Road / Kingwood Pike
Shawn Komondor - Leasee, intersection of Greenbag Road / Kingwood Pike

Interested Parties:
Ted Hastings, Heir to land at the intersection of Greenbag Road / Kingwood Pike
Jennifer Hastings, Heir to land at the intersection of Greenbag Road / Kingwood Pike
Patrick Kyle, Heir to land at the intersection of Greenbag Road and Kingwood Pike.

We ask for community support for a solution we can all agree on!

Thank you!

Signatures

Name	Location	Date
Jennifer Hastings	Park City, UT	2020-11-10
Liv Naugle	US	2020-11-10
Hasan Alshallah	Fairmont, WV	2020-11-10
Sam Burns	Toledo, OH	2020-11-11
Joe DeVincent	Morgantown, WV	2020-11-11
Michelle Hamrick	Morgantown, WV	2020-11-11
Jessica Harvey	Morgantown, WV	2020-11-11
Rebekah Smith	Ridgeland, MS	2020-11-11
Stephany Wilczak	Morgantown, WV	2020-11-11
Mark Kyle	Saint Petersburg, FL	2020-11-11
Vickie Huey	Masontown, PA	2020-11-11
Mason Czarnecki	Walled Lake, US	2020-11-11
Amy Voytek	Reedsville, WV	2020-11-11
sarah dempster	Canton, US	2020-11-11
STACEY HUGHES RODEHEAVER	ARTHURDALE, WV	2020-11-11
Alexis Duckworth	Morgantown, WV	2020-11-11
Cassidy Thompson	Morgantown, WV	2020-11-11
Mykal Antonik	Morgantown, WV	2020-11-11
Ed trippett	morgantown, WV	2020-11-11
Danielle Trumble	Morgantown, WV	2020-11-11

Name	Location	Date
Brandy Beasley	Jackson, MS	2020-11-11
Lisa Keener	Reedsville, WV	2020-11-11
Angel Smothers	Elkridge, MD	2020-11-11
Tracy Voytek	Reedsville, WV	2020-11-11
Jamie murray	Morgantown, WV	2020-11-11
Venus E Warnick	Bruceton Mills, WV	2020-11-11
David West	Morgantown, WV	2020-11-11
Sierra Annonio	Morgantown, WV	2020-11-11
Molly Beckwith	Jackson, MS	2020-11-11
Deborah Herget	Morgantown, WV	2020-11-11
Amanda Mullens	Morgantown, WV	2020-11-11
Jacob Geiger	Morgantown, WV	2020-11-11
Lesley Fleckenstein	Oakdale, PA	2020-11-11
Marcella Merrill	Morgantown, WV	2020-11-11
William Wayne	Morgantown, WV	2020-11-11
Drew Beasley	Jackson, MS	2020-11-11
Shannon Nemecek	Reedsville, WV	2020-11-11
Mellissa Mollohan.	Morgantown, WV	2020-11-11
Monique Rowe	Morgantown, WV	2020-11-11
Cole Smith	morgantown, WV	2020-11-11
Tiffany Murray	Lumberport, WV	2020-11-11
Jordan Friend	Morgantown, WV	2020-11-11

Name	Location	Date
JD Clawges	Morgantown, WV	2020-11-11
Leslie Thorpe	Morgantown, WV	2020-11-11
Treka Bozzato	Morgantown, WV	2020-11-11
Thomas vandevander	Morgantown, WV	2020-11-11
Dawn Nicoloff	Morgantown, WV	2020-11-11
Paula Johnson	Carmichaels, PA	2020-11-11
Rachel Amos	Pasadena, TX	2020-11-11
Amy McDonald	Morgantown, WV	2020-11-11
Heather Helms	Tunnelton, WV	2020-11-11
Donald Mallow	Morgantown, WV	2020-11-11
Lauren Richards	Phoenix, AZ	2020-11-11
Christina Woody	Morgantown, WV	2020-11-11
Brandi Stacks	Morgantown, WV	2020-11-11
Ab Douglass	Morgantown, WV	2020-11-11
vicki zielinski	Morgantown, WV	2020-11-11
Ila Milam	Morgantown, WV	2020-11-11
Justin Kerns	Morgantown, WV	2020-11-11
Brandi Cush	Anchorage, AK	2020-11-11
Helen Rosser	Morgantown, WV	2020-11-11
Kim Tarovisky	Morgantown, WV	2020-11-11
Edward Craft	Morgantown, WV	2020-11-11
Joshua Kyle	Prescott Valley, AZ	2020-11-11

Name	Location	Date
Lauren Griffin	Morgantown, WV	2020-11-11
Savannah Fields	Morgantown, WV	2020-11-11
Karen Helmick	Morgantown, WV	2020-11-11
Nicole Swisher	Morgantown, WV	2020-11-11
Ashley Haverfield	Morgantown, WV	2020-11-11
Susan. Badzek	Gassville, AR	2020-11-11
Mazee Dalton	Smithfield, PA	2020-11-11
Tammy Johnson	Morgantown, WV	2020-11-11
F.E. Ryan	Morgantown, WV	2020-11-11
Erica Davis	Morgantown, WV	2020-11-11
David Michael	Reedsville, WV	2020-11-11
Joe Schmoller	Alhambrah, US	2020-11-11
CYDNEY ROMITO	Morgantown, WV	2020-11-11
Slade Turner	Kingwood, WV	2020-11-11
Mark Thalman	Silver Spring, MD	2020-11-11
Liwa Roman	Khartoum, Sudan	2020-11-11
Tara Boyer	Morgantown, WV	2020-11-11
Heather Manko	Oakland, MD	2020-11-11
Laila Wallace	Fairmont, US	2020-11-11
Andrea Stanley	Reedsville, WV	2020-11-11
Silas Childs	Morgantown, WV	2020-11-11
Alexandria Svolos	Morgantown, WV	2020-11-11

Name	Location	Date
Mark Sanders	Morgantown, WV	2020-11-11
Angela ullery	Morgantown, WV	2020-11-11
April Wolfe	Arthurdale, WV	2020-11-11
Kevin Armstrong	Morgantown, WV	2020-11-11
Pamela Willis	Independence, WV	2020-11-11
Sara Linton	Grafton, WV	2020-11-11
Jaclyn c	Bronx, NY	2020-11-11
Shannon Slemp	Morgantown, WV	2020-11-11
Justin Rice	Morgantown, WV	2020-11-11
Lyndsey Albertazzie	Morgantown, WV	2020-11-11
Rachel Aker	Parsons, WV	2020-11-11
Sarah Lambert	Morgantown, WV	2020-11-11
Rickey Moats	Morgantown, WV	2020-11-11
Shane McManus	Maidsville, WV	2020-11-11
charles harvey	Jacksonville, FL	2020-11-11
Tristan Dennis	Hernshaw, WV	2020-11-11
Jamie Simpson	Morgantown, WV	2020-11-11
Amanda Timmons-Lewis	Morgantown, WV	2020-11-11
Antonette Lawson	Inwood, WV	2020-11-11
James Moore	Morgantown, WV	2020-11-11
RoseAnn Hagee	Morgantown, WV	2020-11-11
Samantha Huckabee	Morgantown, WV	2020-11-11

Name	Location	Date
Misty Leonard	Morgantown, WV	2020-11-11
Joyce Conn	Morgantown, WV	2020-11-11
Chelsy Chaplin	9 maxwell rd, WV	2020-11-11
Ed Mayle	Morgantown, WV	2020-11-11
Shawn Paugh	Morgantown, WV	2020-11-11
julia Husk	Morgantown, WV	2020-11-11
Alana Wagoner	Morgantown, WV	2020-11-11
Nana Pennington	Pittsburgh, PA	2020-11-11
Melissa Blehschmidt	Morgantown, WV	2020-11-11
Melanie Zinn	Kingwood, WV	2020-11-11
Nick Romito	Morgantown, WV	2020-11-11
Jeffery Sypolt	Morgantown, WV	2020-11-11
Janet Boring	Maidsville, WV	2020-11-11
Lindsay Smalls	New York, NY	2020-11-11
Lisa Esmay	Masontown, WV	2020-11-11
Ariana Romito	Morgantown, WV	2020-11-11
Whitney Dudding	Morgantown, WV	2020-11-11
Casey Tenney	Morgantown, WV	2020-11-11
Crystal Turner	Morgantown, WV	2020-11-11
Stacy Greaser	Tunnelton, WV	2020-11-11
Allison Kirby	Morgantown, WV	2020-11-11
Alicia Finkler	Laceyville, US	2020-11-11

Name	Location	Date
Magdalena Rivera	Melbourne, US	2020-11-11
Peter McGinley	Morgantown, WV	2020-11-11
Wendy Metheny	Kingwood, US	2020-11-11
Linda Baer	Morgantown, WV	2020-11-11
Krystle Groves	Morgantown, WV	2020-11-11
Lindsey Naumann	Beckley, WV	2020-11-11
Paul Castner	Morgantown, WV	2020-11-11
abbie swiger	Morgantown, WV	2020-11-11
Elisha Rush	morgantown, WV	2020-11-11
Phil Mullens	Morgantown, WV	2020-11-11
Virginia Turner	Morgantown, WV	2020-11-11
Angela Mayle	Fairview, WV	2020-11-11
Celestine Craver	Morgantown, WV	2020-11-11
Elizabeth Deuster	Centreville, VA	2020-11-11
Jessie Pennell	Morgantown, WV	2020-11-11
Jennifer Lawrence	Masontown, WV	2020-11-11
Raina Meoli	Morgantown, WV	2020-11-11
Brook Gilmore	Morgantown, WV	2020-11-11
Mark Rudmann	Morgantown, WV	2020-11-11
Brittany Perkins	B, WV	2020-11-11
david esmay	high point, NC	2020-11-11
Jamie Farber	Morgantown, WV	2020-11-11

Name	Location	Date
Karen Summers	Uniontown, PA	2020-11-11
Cindy Nelson	Kanab, UT	2020-11-11
Linda Sutherland	Kent, WA	2020-11-11
Delia Trickett	Morgantown, WV	2020-11-11
Annette Chaplin	Dellslow, WV	2020-11-11
Maleea Martin	Morgantown, WV	2020-11-11
Emily Scafella	Morgantown, WV	2020-11-11
Kelly Leftridge	Morgantown, WV	2020-11-11
Rachel Michael	Morgantown, WV	2020-11-11
Donna Walter-Sausen	Pt. Marion, PA	2020-11-11
Aron Berry	Fairmont, WV	2020-11-11
Anthony Rohr	Buckhannon, WV	2020-11-11
Kevin Engels	Morgantown, WV	2020-11-11
Neil Wilson	Morgantown, WV	2020-11-11
Rachel Root	Saratoga Springs, NY	2020-11-11
Stacy Hilling	New York, NY	2020-11-11
Nicole Stolzenbach	Morgantown, WV	2020-11-11
Jennifer wilson	Morgantown, WV	2020-11-11
Michelle McGilton	Morgantown, WV	2020-11-11
Dustin Fisher	Morgantown, WV	2020-11-11
Sherry Croston	Morgantown, WV	2020-11-11
Elizabeth Sneathen	Morgantown, WV	2020-11-11

Name	Location	Date
Linda D'Amico	Elkridge, MD	2020-11-11
Kayla Halsey	Swannanoa, US	2020-11-11
David Hull	Morgantown, WV	2020-11-11
Brian Crowe	Morgantown, WV	2020-11-11
Madelyn Mitchell	Morgantown, WV	2020-11-11
Priscilla Burke	Morgantown, WV	2020-11-11
Lou Mayle	Morgantown, WV	2020-11-11
Maryann Folz	Morgantown, WV	2020-11-11
Rich Snider	Alexandria, VA	2020-11-11
Mark Blaney	Morgantown, WV	2020-11-11
Sarah McLaughlin	Reedsville, WV	2020-11-11
Kristen Wiley	Morgantown, WV	2020-11-11
Haley Nicholson	Morgantown, WV	2020-11-11
Shannon Moran	Morgantown, WV	2020-11-11
Melissa Reynolds	Morgantown, WV	2020-11-11
Caron Vilasuso	Morgantown, WV	2020-11-11
Sherri Lee Grant	Chesapeake, US	2020-11-11
Debby Willette	Greencastle, US	2020-11-11
jauna claypool	Santa Rosa, CA	2020-11-11
Joey James	Morgantown, WV	2020-11-11
Carol Legg	Crawley, WV	2020-11-11
Chris Benison	Morgantown, WV	2020-11-11

Name	Location	Date
Steffanee Shrout	Arthurdale, WV	2020-11-11
Susan Seitz	Morgantown, WV	2020-11-11
Alicia Pingley	New York, NY	2020-11-11
Angelica Brennen	Alexandria, VA	2020-11-11
Erin Guy	Morgantown, WV	2020-11-11
Adelheid Schaupp	Coraopolis, PA	2020-11-11
Tori Vasquez	Morgantown, WV	2020-11-11
Tyrone Beafore	US	2020-11-11
Heidi marshall	valencia, PA	2020-11-11
Marleen Davila	Morgantown, WV	2020-11-11
Tracey Smith	Bridgeville, PA	2020-11-11
Eli Kinsler	Wells, US	2020-11-11
Brad Rodgers	Brentwood, US	2020-11-11
Dianna Crews	Arlington, US	2020-11-11
Guadalupe Barrera	Van Nuys, US	2020-11-11
Jeremiah Phillips	Austin, US	2020-11-11
kiara shine	morgantown, WV	2020-11-11
Chaska Laxton	Des Moines, US	2020-11-11
Shay M	Denver, US	2020-11-11
Will Davis	Syracuse, US	2020-11-11
Ella Smith	Pacific Grove, US	2020-11-11
Steven Servin	Eureka, US	2020-11-11

Name	Location	Date
Stella Freedberg	Upper Saddle River, US	2020-11-11
Marianne Courtney	Pittsburgh, PA	2020-11-11
Cameron Qualls	Clemson, US	2020-11-11
Perry Gx	Tustin, US	2020-11-11
Tim Lodkin	Medfield, US	2020-11-11
Reed Beaumont	Fishers, US	2020-11-11
Benjamin k Outfkirt	San Diego, US	2020-11-11
Christa Erickson	Spokane, US	2020-11-11
Aspen Pearson	Newport, US	2020-11-11
rose petty	Redlands, US	2020-11-11
Tim Herr	Council Bluffs, US	2020-11-11
Mila Sutch	Irvine, US	2020-11-11
Lucia Emery	Sugar Land, US	2020-11-11
Patricia Curran	Allentown, US	2020-11-11
Jack Nona	Madison Heights, US	2020-11-11
Jayden Georges	Brooklyn, US	2020-11-11
Annette Long-stinnett	Tahlequah, OK	2020-11-11
Quanisha Hughley	Alexander City, US	2020-11-11
Mama Alston	Dundalk, US	2020-11-11
Claire Richard	Franklin, US	2020-11-11
Sam Phifer	US	2020-11-11
Kathy Akopyan	North Hollywood, US	2020-11-11

Name	Location	Date
diana Rangel	Charlotte, US	2020-11-11
LaKeisha Thomas	Westland, US	2020-11-11
Julie Foster	Ocean Springs, US	2020-11-11
Roy Vincent	Honolulu, US	2020-11-11
Michelle Babikian	Northbrook, IL	2020-11-11
Alex martinez	Alameda, US	2020-11-11
Avishi Gupta	US	2020-11-11
Joshua Travis	Maynard, US	2020-11-11
Jose Ruiz	Lamont, US	2020-11-11
Thalia Boni	Danbury, US	2020-11-11
Alex Meza	Harrisonburg, US	2020-11-11
Megan Brunner	Aurora, US	2020-11-11
Marcine McBride	West Babylon, NY	2020-11-11
Katrina W	Jackson, US	2020-11-11
Bobby Roberts	Trenton, US	2020-11-11
Hunter Thompson	Fort gay, US	2020-11-11
Jonathan Nievez	Phoenix, US	2020-11-11
Sharita Anthony	Rock Hill, US	2020-11-11
simha poopy	San Ramon, US	2020-11-11
Aidan Qualls	Kentucky, US	2020-11-11
Rhonda Edwards	Port Orchard, WA	2020-11-11
Tisha Crumble	Chino Hills, US	2020-11-11

Name	Location	Date
alexia samsonov	Oxford, US	2020-11-11
Jenna Whaley	Los Angeles, US	2020-11-11
Andrew Humphrey	Mount Pleasant, US	2020-11-11
Brandon Rockhold	Chicago, US	2020-11-11
Gwendolynn Burns	Port Charlotte, US	2020-11-11
Zaniya Roland	Hopewell, US	2020-11-11
Tony Cho	Baltimore, US	2020-11-11
Dylan Resendiz	Islip, US	2020-11-11
Brandon Sickles	Morgantown, WV	2020-11-11
Gena Naugle	Morgantown, WV	2020-11-11
Alex Liband	Canyon, US	2020-11-11
Eliza Drown	Morgantown, WV	2020-11-11
Leah Adkins	Morgantown, WV	2020-11-11
Tiffany Smith starks	Oklahoma City, US	2020-11-11
Eileen Mouyard	Morgantown, WV	2020-11-11
Tara Davis	Morgantown, WV	2020-11-11
Jeff Webb	Morgantown, WV	2020-11-11
Josh Baldwin	Morgantown, WV	2020-11-11
douglas edwards	Dilliner, PA	2020-11-11
Maya Maupin	Morgantown, WV	2020-11-11
Melinda Sickles	Morgantown, WV	2020-11-11
Josh Graham	Morgantown, WV	2020-11-11

Name	Location	Date
Andrew Flanagan	Morgantown, WV	2020-11-11
Katherine Majakey	Morgantown, WV	2020-11-11
Andrew Quick	Morgantown, WV	2020-11-11
Mckenzie Pennix	Morgantown, WV	2020-11-11
Logan Thorne	Fairmont, WV	2020-11-11
Brandon Gunter	Morgantown, WV	2020-11-11
Travis Skeen	US	2020-11-11
Betty Rosser	Morgantown, WV	2020-11-11
Geo Rodriguez	Pittsburgh, PA	2020-11-11
Michael Moyer	Morgantown, WV	2020-11-11
Adam Kaluba	Burleson, US	2020-11-11
Sarah Sidwell	Morgantown, WV	2020-11-11
Suzi Sagryan	North Hollywood, US	2020-11-11
DJTF Perfect	US	2020-11-11
Danielle Evans	Urbandale, US	2020-11-11
Kendall kabb	Parsippany, US	2020-11-11
Nathan Harrington	Henderson, US	2020-11-11
Rijve Choudhury	Passaic, US	2020-11-11
Emilia Vasquez	Harrison, US	2020-11-11
Anna Laidler	East Stroudsburg, US	2020-11-11
Ellie Koetter	Cincinnati, US	2020-11-11
Alexandra Whittendale	Renton, US	2020-11-11

Name	Location	Date
kayla feingold	Atlanta, US	2020-11-11
Nasiir Mackey	Newark, US	2020-11-11
Michael Bacotti	Clermont, US	2020-11-11
Avag Virabyan	Granada Hills, US	2020-11-11
Abigail Tolbert	Saint Paul, US	2020-11-11
Gizella Valencia	Pleasanton, US	2020-11-11
Susie smith	Dunkirk, US	2020-11-11
Isabelle Loisel	Tacoma, US	2020-11-11
Rachel Wattick	Pittsburgh, PA	2020-11-11
Mira Dict	Indianapolis, US	2020-11-11
Meri Sagryan	Pico Rivera, US	2020-11-11
Raymond Berrios	US	2020-11-11
Travis Marasigan	Houston, US	2020-11-11
Michael Adame	Midland, US	2020-11-11
Abby Williams	Dallas, US	2020-11-11
Abner Aylai	Lawrenceville, US	2020-11-11
Izeyah Wellssmith	Saint Louis, US	2020-11-11
josie shea	Richmond, US	2020-11-11
Casandra Nunez	Tampa, US	2020-11-11
David Sheets	Denver, US	2020-11-11
Drake Lette	Udall, US	2020-11-11
Mark Insani	Morgantown, WV	2020-11-11

Name	Location	Date
Kyle Brooks	Hanover, US	2020-11-11
Karen Z	Los Angeles, US	2020-11-11
Lydia Molnar	Hollywood, US	2020-11-11
Alex Nelson	Manchester, US	2020-11-11
Suzanne Pustka	Lovelady, US	2020-11-11
Josh Mattoon	Chattanooga, US	2020-11-11
Anissa Hilaire	Georgetown, US	2020-11-11
Mary D'Amico	Ramsey, US	2020-11-11
Cindy Jiang	Philadelphia, US	2020-11-11
Mahdi Muhamad	Chicago, US	2020-11-11
Senara Gillig-Monroe	Kent, US	2020-11-11
sofi terteryan	glendale, US	2020-11-11
Johanna Reyes	Norfolk, US	2020-11-11
Amy Brock	Lillington, US	2020-11-11
nancy rogate	Lehigh Acres, US	2020-11-11
Chris Case	Auburn, US	2020-11-11
Tiana Varang	Bellingham, US	2020-11-11
Audrey Allan	Devon, US	2020-11-11
Patricia Moses	Lompoc, US	2020-11-11
Jiniya Newsome	Saint Louis, US	2020-11-11
Mike Dowd	Fishers, US	2020-11-11
Sarah Peterson	Summerville, US	2020-11-11

Name	Location	Date
thomas taylor	morgantown, WV	2020-11-11
Georgeann Dau	Huntington, US	2020-11-11
Krisstal Aleysha	US	2020-11-11
Lexi B	Dearborn, US	2020-11-11
Samuel Shelton	Seattle, US	2020-11-11
John Kuhn	Plymouth, US	2020-11-11
RIley Rogers	Parker, US	2020-11-11
Carly Lakes	US	2020-11-11
Marianne Vazquez	El Monte, US	2020-11-11
Shawniee Cockett	US	2020-11-11
T. Hansen	Mount Vernon, US	2020-11-11
Greg Alessio	Grafton, US	2020-11-11
Lucy Tran	Westminster, US	2020-11-11
Joe cardot	Fort Collins, CO	2020-11-11
Lamar Mathews	Indianapolis, US	2020-11-11
lilly williams	sandy, US	2020-11-11
Gayane Matevosyan	Burbank, US	2020-11-11
Trinity Snapper	Homer, US	2020-11-11
Sandy Keller	Baltimore, US	2020-11-11
Ben Kessler	Columbia, SC	2020-11-11
Joshua Benson	Utica, US	2020-11-11
Diana Urbina	Pico Rivera, US	2020-11-11

Name	Location	Date
Chris Berlet	La Harpe, US	2020-11-11
James Lemon	Cedarburg, US	2020-11-11
Catie Biby	Round Hill, US	2020-11-11
lexi dovner	Boynton Beach, US	2020-11-11
Nicholas Jensen	Aliso Viejo, US	2020-11-11
Jennifer Cowell	Casper, US	2020-11-11
alice smith	Colorado City, US	2020-11-11
Ayele Tekleab	US	2020-11-11
Renee Harrell	Lake Wales, US	2020-11-11
Nae'Yauna Squalls	Warren, US	2020-11-11
Riley Wilson	Ann Arbor, US	2020-11-11
Lauren Failano	Hayward, US	2020-11-11
No Name	Saint Paul, US	2020-11-11
Sheryl Keat	Stuart, US	2020-11-11
Linda Anderson	Indianapolis, US	2020-11-11
Agim Demirovski	US	2020-11-11
Gabriella Brown	Chicago, US	2020-11-11
Camilla Turgunbaeva	Cumming, US	2020-11-11
Madison Florczyk	North Attleboro, US	2020-11-11
Shellsee Gutierrez	Chula Vista, US	2020-11-11
Gina Petty	Lexington, US	2020-11-11
Batya Khadideh	Brooklyn, US	2020-11-11

Name	Location	Date
Rudra Ray	New York, US	2020-11-11
Suzanne Lamberg	New York, US	2020-11-11
Hayleigh witmer	Bakersfield, US	2020-11-11
cameron rowray	Yellville, US	2020-11-11
Ashlee Moore	Sunnyvale, US	2020-11-11
Cheryl Gallegos	OR, US	2020-11-11
Christopher Saulsby	Dentin, US	2020-11-11
Angela Bates	US	2020-11-11
Deylen Chew	Silver Spring, US	2020-11-11
Bernadine Erickson	Anchorage, US	2020-11-11
Felipe Hernandez	Lawrence, US	2020-11-11
Jennifer Mahan	Anchorage, AK	2020-11-11
M. Browning	Chandler, US	2020-11-11
Lea Soto	US	2020-11-11
Dena Young	San Diego, US	2020-11-11
lex lewis	Melrose, US	2020-11-11
Citlalik Lopez	Playa Del Rey, US	2020-11-11
Celia Caputo	Miller place, US	2020-11-11
Anya Phillips	Portland, US	2020-11-11
Joseph Babadook	Kenosha, US	2020-11-11
Sapphire Woodby	Burnsville, US	2020-11-11
Destiny Huerta	Tulsa, US	2020-11-11

Name	Location	Date
Joshua Hamilton	Zionsville, US	2020-11-11
Tyler Wright	Dallas, US	2020-11-11
zachary larrick	La Puente, US	2020-11-11
Crystal Jimenez	Salem, US	2020-11-11
Amena Holmes	Westland, US	2020-11-11
Matt Redle	Sheridan, WY	2020-11-11
Vanessa Harrison	Chicago, US	2020-11-11
oscar salgado	Carpentersville, US	2020-11-11
Kate Hines	Morgantown, WV	2020-11-11
Danaliz Roa	Bronx, US	2020-11-11
Kaylin Prouza	Hanover Park, US	2020-11-11
Raechel Bundy	Wilmington, US	2020-11-11
Blanca Garza	Longmont, US	2020-11-11
david sierra	Manati, US	2020-11-11
Jose Casarreal	Apple Valley, US	2020-11-11
Grace Standridge	Antlers, US	2020-11-11
David Tracy	bucksport, ME	2020-11-11
Glenda Branch-McDowell	Passaic, US	2020-11-11
Betty Waller	Las Vegas, US	2020-11-11
Peter Schellhorn	Glenview, IL	2020-11-11
Diana Ramirez	Staten Island, NY	2020-11-11
Annalise Calderon	Yonkers, US	2020-11-11

Name	Location	Date
Lori Banks	Bucyrus, US	2020-11-11
Paul Vallette	Morgantown, WV	2020-11-11
Quinlin Vasquez	Morgantown, WV	2020-11-11
Nusrat Khan	Woodside, US	2020-11-11
Kennedy Skaggs	Winston-salem, NC	2020-11-11
Brenna Kinsey	Elmhurst, US	2020-11-11
Rachel Keefover	Motown, WV	2020-11-11
Stephen Flora	Philadelphia, OH	2020-11-11
leah robinson	Morgantown, WV	2020-11-11
Corey VanBibber	Charleston, WV	2020-11-11
Sarah Cohen	Philadelphia, PA	2020-11-11
Chelsea Gunnell	Charleston, WV	2020-11-11
Allison McCue	Fairmont, WV	2020-11-11
Brandon Lasure	Morgantown, WV	2020-11-11
James Braswell	Morgantown, WV	2020-11-11
Amanda St.Clair	Morgantown, WV	2020-11-11
Ceda Reed	Morgantown, WV	2020-11-11
Tyler ASH	Morgantown, WV	2020-11-11
doria wosk	miami, FL	2020-11-11
Eleanor Bragg	US	2020-11-11
Allyson Petry	Clarksburg, WV	2020-11-11
Celeste Walters-Walsh	Morgantown, WV	2020-11-11

Name	Location	Date
Summer Love	Seattle, WA	2020-11-11
Chad Randalls	Morgantown, WV	2020-11-11
Amber Huffman	Morgantown, WV	2020-11-11
Angela Carver	Morgantown, WV	2020-11-11
Jeff Freeland	Shinnston, WV	2020-11-11
Kelsey O'Shields	Morgantown, WV	2020-11-11
Charter Stinespring	Bentleyville, PA	2020-11-11
Ceranda Jones	Morgantown, WV	2020-11-11
christopher stinespring	Masontown, WV	2020-11-11
Tarik Kalwar	Morgantown, WV	2020-11-11
Cody Shane	Morgantown, WV	2020-11-11
Lauren Mayle	Morgantown, WV	2020-11-11
Kayla Bain	Fairmont, WV	2020-11-11
Brian Pickens	Morgantown, WV	2020-11-11
James Connelly	US	2020-11-11
Morgan Cira	Morgantown, WV	2020-11-11
Jasmine Haas	Flower Mound, TX	2020-11-11
Sam Fisher	Morgantown, WV	2020-11-11
Adrienne Epley Brown	Morgantown, WV	2020-11-11
Alex Everett	Morgantown, WV	2020-11-11
Forrest Robbins	Morgantown, WV	2020-11-11
Robin Hart	Clarksburg, WV	2020-11-11

Name	Location	Date
Rebecca Thomas	Charleston, WV	2020-11-11
Stanton Manilla	Morgantown, WV	2020-11-11
Barbara Ronk	Morgantown, WV	2020-11-11
Bertalan Czinege	Pittsburgh, PA	2020-11-11
Sam Schneider	Morgantown, WV	2020-11-11
Lexi D'Souza	Durham, NC	2020-11-11
Alexander Cruzzavala	Morgantown, WV	2020-11-11
Ader Hutchinson	Morgantown, WV	2020-11-11
Tori Boling	Morgantown, WV	2020-11-11
Keslie Warnick	Bruceton Mills, WV	2020-11-11
Lisa Kriegar	Dundee, NY	2020-11-11
Rachel Blais	Morgantown, WV	2020-11-11
Maggie Haislip	Morgantown, WV	2020-11-11
Ryan Fieldman	Morgantown, WV	2020-11-11
Amy Sidwell	Morgantown, WV	2020-11-11
Sara Bostonia	Grafton, WV	2020-11-11
Ginny Aultman-Moore	Westover, WV	2020-11-11
Elizabeth Nelson	Morgantown, WV	2020-11-12
D.J. Spacht	Mt Morris, PA	2020-11-12
Tyler Jones	Morgantown, WV	2020-11-12
Mary Dunford	Morgantown, WV	2020-11-12
Jaime Covington	Toledo, OH	2020-11-12

Name	Location	Date
Kayla Kendall	Pikesville, MD	2020-11-12
Patty Dalton	Elkridge, MD	2020-11-12
Blake McKenzie	Huntington, WV	2020-11-12
Christy Whetsell	Morgantown, WV	2020-11-12
Alexis Moore	Albright, WV	2020-11-12
Sarah Hoblitzell	Masontown, WV	2020-11-12
Melissa Romito	Morgantown, WV	2020-11-12
Anna Hicks	Toledo, OH	2020-11-12
Jan Chepeska	Belleville, MI	2020-11-12
Patti Miller	Manchester, PA	2020-11-12
Jeanne Lemasters	Morgantown, WV	2020-11-12
Christopher Swecker	Morgantown, WV	2020-11-12
Shawn Komondor	Morgantown, WV	2020-11-12
Donald Varney	Catlettsburg, KY	2020-11-12
thomas kelly III	Germantown, OH	2020-11-12
Phillip Nisius	Everett, WA	2020-11-12
Kathy McCurdy	Morgantown, WV	2020-11-12
Adam Webster	Morgantown, WV	2020-11-12
Tabby Luckey	Morgantown, WV	2020-11-12
Michael Miller	Clarksburg, WV	2020-11-12
Nick Gwinn	Morgantown, WV	2020-11-12
Diane Pilon	Morgantown, WV	2020-11-12

Name	Location	Date
Jerry Handley	Morgantown, WV	2020-11-12
Leah McAllister	Morgantown, WV	2020-11-12
Paul Blackburn	Elizabethtown, KY	2020-11-12
Linda Gurney	Morgantown, WV	2020-11-12
Joyce Tennant	Maidsville, WV	2020-11-12
Marsha Rohozen	Morgantown, WV	2020-11-12
Atreyu Browning	Jefferson, MD	2020-11-12
Naomi Porterfield	Morgantown, WV	2020-11-12
Joyce DeLawder	Morgantown, WV	2020-11-12
Carrie Hibner	Charleston, WV	2020-11-12
Victoria Eisentrout	New York, WV	2020-11-12
Rosie Moats	Morgantown, WV	2020-11-12
Sandra Laurita	Fairmont, WV	2020-11-12
Alexander Larson	New York, US	2020-11-12
Zoe Anderson	Ashland, OR	2020-11-12
Serje Stapaev	North Hollywood, US	2020-11-12
Grace Nah	Albany, US	2020-11-12
Andre Miller	Cedar Rapids, US	2020-11-12
Brody Hiscock	Iowa City, US	2020-11-12
MYRNA Ferguson	Denver, US	2020-11-12
Patrick Sutherland	West Virginia	2020-11-12
Raymond Durbin	Morgantown, WV	2020-11-12

Name	Location	Date
Gerald Paugh	Morgantown, WV	2020-11-12
Tyler Abe	Bronx, NY	2020-11-12
Jamie Jackson	Morgantown, WV	2020-11-12
Shelly Mullenax	Morgantown, WV	2020-11-12
Jennifer Woody	Morgantown, WV	2020-11-12
Robert Clark	Morgantown, WV	2020-11-12
Mykah Gatlin	Morgantown, WV	2020-11-12
Brenda Gyorko	Morgantown, WV	2020-11-12
Julie Campbell	Morgantown, WV	2020-11-12
Julie Shinaberry	Morgantown, WV	2020-11-12
John lamar	Morgantown, WV	2020-11-12
Rebecca Diaz	Fairmont, WV	2020-11-12
Sarah Berardinelli	Morgantown, WV	2020-11-12
DALLAS MAY	Morgantown, WV	2020-11-12
Mary Riffle	Morgantown, WV	2020-11-12
Alicia Montoya	Coraopolis, PA	2020-11-12
Benjamin Barnes	Morgantown, WV	2020-11-12
Joanne Bevan	Cambridge, Ontario, Canada	2020-11-12
joyce arndt	Weyerhaeuser, WI	2020-11-12
Grace Smith	Morgantown, WV	2020-11-12
Orlando Cruz	Morgantown, WV	2020-11-12
Diana Canale	Morgantown, WV	2020-11-12

Name	Location	Date
Jessica Bier	Pound, VA	2020-11-12
Andrew Cruz	Fort Collins, CO	2020-11-12
Shannon Downey	Morgantown, WV	2020-11-12
Alex Herbst	Morgantown, WV	2020-11-12
Jane Nicoli	Fairmont, WV	2020-11-12
Bethann Kendall	Pasadena, MD	2020-11-12
Matthew Burns	Morgantown, WV	2020-11-12
Patricia Witt	Morgantown, WV	2020-11-12
Byron Mitchell	Alexandria, VA	2020-11-12
Curtis Franey	New Market, MD	2020-11-12
Venus Riley	Richmond, VA	2020-11-12
Ruth Gibson	Morgantown, WV	2020-11-12
Maria Gibson	Masontown, WV	2020-11-12
Judy Kraycar	Morgantown, WV	2020-11-12
Keith Hill	Morgantown, WV	2020-11-12
Hunter Snoderly	Morgantown, WV	2020-11-12
hale davis	walker, WV	2020-11-12
Lynn Hilling	Morgantown, WV	2020-11-12
Judy Henry	Morgantown, WV	2020-11-12
Betsy Forester	Charleston, WV	2020-11-12
Susan Norman	Ashburn, US	2020-11-12
Shannon Dalton	Tyler, TX	2020-11-12

Name	Location	Date
Mark Downs	Morgantown, WV	2020-11-13
Jennifer Wade	US	2020-11-13
Bobbi Fitchett Greathouse	New York, NY	2020-11-13
Summer Cochran	Morgantown, WV	2020-11-13
Lillian Arnold	Morgantown, WV	2020-11-13
Debra DeBerry	Morgantown, WV	2020-11-13
Callie Taylor	Morgantown, WV	2020-11-13
Wanda Yeager	Morgantown, WV	2020-11-13
Peggy Luzier	Morgantown, WV	2020-11-13
Vickie McDonald	Morgantown, WV	2020-11-13
Katie Saunders	Charleston, WV	2020-11-13
Sara Reed	Morgantown, WV	2020-11-13
Jenny Vaughn	Jacksonville, FL	2020-11-13
Mary Hastings	Morgantown, WV	2020-11-13
Chelsea Dauphinee	Raleigh, NC	2020-11-13
Rachelle Bennett	Morgantown, WV	2020-11-13
Lloyd Huyett IV	Womelsdorf, PA	2020-11-13
Aysha Mahmood	Fort Lauderdale, FL	2020-11-13
Jodi Devall	Morgantown, WV	2020-11-13
Callie McDonald	Elkridge, MD	2020-11-13
Betty Napper	Bruceton Mills, WV	2020-11-13
Tricia Goodwin	Morgantown, WV	2020-11-13

Name	Location	Date
Brenda Freeman	Bridgeport, WV	2020-11-13
William Keechel	Morgantown, WV	2020-11-14
Sylvia McMillen	Morgantown, WV	2020-11-14
Bobbie Willie	Morgantown, WV	2020-11-14
Cassandra George	Dellslow, WV	2020-11-14
Waylon Burke	Morgantown, WV	2020-11-14
Melody George	Morgantown, WV	2020-11-14
Luke Lavenski	Asheville, NC	2020-11-14
Karen Shulick-Robinson	Morgantown, WV	2020-11-14
Marie White	Morgantown, WV	2020-11-14
Marie Mayfield	Fairmont, WV	2020-11-14
Carol McMillen	Morgantown, WV	2020-11-14
Judy Bosley	Morgantown, WV	2020-11-14
Mary Dalton	Morgantown, WV	2020-11-14
Emily Landsittel	Pittsburgh, US	2020-11-14
Janet Whipkey	Morgantown, WV	2020-11-14
Becky Jackson	Bridgeport, WV	2020-11-14
Rachel Byrne	Bronx, NY	2020-11-14
Marilyn Hastings	Morgantown, WV	2020-11-14
Danielle Martin	Silver Spring, MD	2020-11-14
Erin Graber	Morgantown, WV	2020-11-14
Cheryl L. Warman	Morgantown, WV	2020-11-15

Name	Location	Date
Leighton Braham	Kingwood, WV	2020-11-15
Robin Masters	Morgantown, WV	2020-11-15
pablo ruiz	burleson, US	2020-11-15
Morgan Buenos	Alexandria, VA	2020-11-15
Shannon Dickerson	Morgantown, WV	2020-11-15
Garrett Richards	Morgantown, WV	2020-11-15
Melissa Villers	Woodstock, GA	2020-11-15
Jeanette Custer	Morgantowm, WV	2020-11-15
Rich Ryan	Morgantown, WV	2020-11-15
Lucy McBee	Morgantown, WV	2020-11-15
Scott Ruscello	Pittsburgh, PA	2020-11-15
Michael Smith	Morgantown, WV	2020-11-15
Cheryl Baker	Morgantown, WV	2020-11-15
Saranga Dilshan	US	2020-11-15
Julissa Andrews	Vredenburgh, US	2020-11-15
abbigail cedillo	Jeffersonville, US	2020-11-15
alicia anaya	Floresville, US	2020-11-15
Alexis Partida	Houston, US	2020-11-15
Mollie Kawakami	Columbus, US	2020-11-15
Samantha Morris	Brooklyn, US	2020-11-15
Wish Carroll	Indianapolis, US	2020-11-15
Courtney Mitchell	Reading, US	2020-11-15

Name	Location	Date
Yaya Ayay	Austin, US	2020-11-15
Cassie Dawson	Morgantown, WV	2020-11-15
Alyssa Earnhart	Grand Chain, US	2020-11-15
Jayla Clark	Fort Wayne, US	2020-11-15
Brenda Michaca	Edison, US	2020-11-15
Erin L	Wheaton, US	2020-11-15
Avionna Ross	Beaver Dam, US	2020-11-15
Olivia Fernandes	Brooklyn, US	2020-11-15
cathie moss	West Memphis, US	2020-11-15
Ella Bica	Raleigh, US	2020-11-15
camila amaya	Berwick, US	2020-11-15
Liz Molloy	Clovis, US	2020-11-15
Rogelio Argueta	Diamond Bar, US	2020-11-15
Fernando Rodriguez	Fort Worth, US	2020-11-15
Ivy Alconaba	Virginia Beach, US	2020-11-15
Angie Ñ	Gilbert, US	2020-11-15
Nevaeh Rubin	Newport News, US	2020-11-15
Melody Richman	Carmichaels, PA	2020-11-15
Joshua Kyle	Morgantown, WV	2020-11-15
Drew VanderWijst	Venetia, PA	2020-11-15
Gerry VanderWijst	Elkridge, MD	2020-11-15
Gary Johnson	Cape Coral, FL	2020-11-15

Name	Location	Date
Lori Orosz	Bridgeport, WV	2020-11-15
Erika Mastalerz	Morgantown, WV	2020-11-15
Lesa Carlier	Pittsburgh, PA	2020-11-15
Emily Frey	Charlottesville, VA	2020-11-15
Daniel Mathews	Charlottesville, VA	2020-11-15
Cheryl Brock	Morgantown, WV	2020-11-15
Rebecca Davis	Morgantown, WV	2020-11-15
DANIELLE FORD	MORGANTOWN, WV	2020-11-15
Eliana Tauger	Morgantown, WV	2020-11-15
Maureen O'Brien	Morgantown, WV	2020-11-15
Hannah Cross	La Salle, CO	2020-11-16
Melissa Wilson	Westover, WV	2020-11-16
john louladakis	Thessaloníki, Greece	2020-11-16
Abigail Miller	Morgantown, WV	2020-11-16
Brenna Williamson	Morgantown, WV	2020-11-16
Nathan Murray	New York, NY	2020-11-16
Ruth Murray	Morgantown, WV	2020-11-16
Amanda Murray	Morgantown, WV	2020-11-16
Mandra Trickett	Morgantown, WV	2020-11-16
George Bolyard	Kingwood, WV	2020-11-16
Emma Luzader	Morgantown, WV	2020-11-16
Holly Alvarez	Morgantown, WV	2020-11-16

Name	Location	Date
godefroid rita	Spa, Belgium	2020-11-16
Bethany Hilling	Morgantown, WV	2020-11-16
Travis Murray	Morganown, WV	2020-11-16
Shane Riley	Morgantown, WV	2020-11-16
Sharon Ward	Stafford, VA	2020-11-16
Birgül Aslan	Istanbul, Turkey	2020-11-16
Sarah Beamer	Aiken, SC	2020-11-16
Melissa McDonald	Reedsville, WV	2020-11-16
Jacee Greaser	Smithfield, PA	2020-11-16
Mercedes A	Westover, WV	2020-11-16
Jeffrey Hicks	New Castle, US	2020-11-16
Ryan Lindsay	Morgantown, WV	2020-11-16
Buddy Guthrie	Morgantown, WV	2020-11-17
Susan Callahan	Morgantown, WV	2020-11-17
Kathy Scotchel	Star City, WV	2020-11-17
judy pappalardo	pittsburgh, PA	2020-11-17
Sadie Hilling	Morgantown, WV	2020-11-17
Kim Tennant	Morgantown, WV	2020-11-17
Cali VanderWijst	Martinsburg, WV	2020-11-17
Anita Blosser	Morgantown, WV	2020-11-18
Vanessa Richards	Cape Coral, WV	2020-11-18
Carole Williams	Morgantown, WV	2020-11-18

Name	Location	Date
Holly McMullen	Morgantown, WV	2020-11-18
Dana Dean	Morgantown, WV	2020-11-18
Erin Ryan	Cape Coral, FL	2020-11-19
David Q	Morgantown, WV	2020-11-19
Patricia Wells	Morgantown, US	2020-11-19
kayla debiase	Fairmont, WV	2020-11-19
Alex Finzel	Morgantown, WV	2020-11-19
Falon Snodgrass	Morgantown, WV	2020-11-19
Michael Nolting	Morgantown, WV	2020-11-19
Nehemias Cerritos	Sterling, VA	2020-11-20
Wendy Monge	Reston, VA	2020-11-20
Yesenia Membreno	Reston, VA	2020-11-20
Nick Johnson	Louisville, KY	2020-11-20
Elisa Monge	Sterling, VA	2020-11-20
Mehgan Haskiell	Detroit, MI	2020-11-20
David Annonio	Morgantown, WV	2020-11-20
David Regenold	Baltimore, US	2020-11-20
Steven Winkels	Morgantown, WV	2020-11-21
Jeff Nanfelt	Centreville, VA	2020-11-22
Lisa Bennett	Rainelle, WV	2020-11-23
Mary Westermeyer	Morgantown, WV	2020-11-24
John McCarrick	Martinsburg, WV	2020-11-25

Name	Location	Date
Ted Hastings	Morgantown, WV	2020-11-25
Elizabeth Smith	Morgantown, WV	2020-11-25
Robert Borkowski	Morgantown, WV	2020-11-25
Melissa Clark	Glen Jean, WV	2020-11-25
You don't Wanna know	Aliso Viejo, US	2020-11-25
Claire Patrascu	Austin, US	2020-11-25
Sharon Lee	Huntingdon Valley, US	2020-11-25
Ellie Mitchell	O Fallon, US	2020-11-25
brian smith	Staten Island, US	2020-11-25
Rose Sanchez	New York, US	2020-11-25
madi worth	twp, US	2020-11-25
Kayla Rold	Sicklerville, US	2020-11-25
rosemary torossian	Sherman Oaks, US	2020-11-25
Christopher Lazzell	Morgantown, WV	2020-11-25
Logan Hoyd	La Grange, US	2020-11-25
Cindy tran	New Bern, US	2020-11-25
Dyani Andrewin	Hawthorne, US	2020-11-25
yasi etemadi	Morgantown, WV	2020-11-25
Laryssa Suffardo	Howard beach, US	2020-11-25
Nina Skific	Saddle Brook, US	2020-11-25
Cody Addison	Greensburg, PA	2020-11-25
Sophia Ferguson	Palm Bay, US	2020-11-25

Name	Location	Date
Will Deskins	Beckley, WV	2020-11-25
Carly Birchard	Concord, US	2020-11-25
Richy Garcia	Charlotte, US	2020-11-25
Natalie Good	Phoenix, US	2020-11-25
Madison Pinneda	Fort Worth, US	2020-11-25
Ellen Tomies	Everett, US	2020-11-25
Mary Korf	Fairmont, WV	2020-11-25
Shaylynn Brown	Graham, US	2020-11-25
Ashlee Goodwin	Morgantown, WV	2020-11-25
brandon zilkanich	Morgantown, WV	2020-11-25
Rob Lazzell	Brooklyn, NY	2020-11-25
Tara McBride	Cumming, US	2020-11-25
Nawfal Saaid	Morgantown, WV	2020-11-25
Avery Wolfe	Spring, US	2020-11-25
evelyn chase	Wareham, US	2020-11-25
Angelina Rocio	Brownsville, US	2020-11-25
Charles Crooks	Morgantown, WV	2020-11-25
ed martinez	el paso, US	2020-11-25
Marlin Dehoff	Morgantown, WV	2020-11-25
Stevie Stephens	Bronx, NY	2020-11-25
Diya Shahi	Newburgh, US	2020-11-25
Brian Harrison	Pittsfield, US	2020-11-25

Name	Location	Date
Noah Lopez	US	2020-11-25
Taylor Hill	Pinehurst, US	2020-11-25
ROBERT ECKENRODE	Morgantown, WV	2020-11-25
Hali Brown	Morgantown, WV	2020-11-25
Noah Meyers	Morgantown, WV	2020-11-25
Christina Trimmer	Morgantown, WV	2020-11-25
Clay Condon	Hillsboro, WV	2020-11-25
Jennifer Wriston	Weaverville, NC	2020-11-25
Myles Forsyth	Morgantown, WV	2020-11-25
Mike Manypenny	Grafton, WV	2020-11-25
Meghan Davenport	Morgantown, WV	2020-11-25
Noel Thomas	Pittsburgh, PA	2020-11-25
Chris Herrod	Morgantown, WV	2020-11-25
Alexis Mullins	Morgantown, WV	2020-11-25
Ella Mandel	Mission Viejo, US	2020-11-25
Jayden Aganos	Kahului, US	2020-11-25
John Ramirez	San Antonio, US	2020-11-25
Brandi Sherman	US	2020-11-25
Andrew Vangorder	York, US	2020-11-25
Virgil Virga Jr	Daniel Island, SC	2020-11-25
Michael Barr	Morgantown, WV	2020-11-25
Rachelle Mathieu	Colchester, US	2020-11-25

Name	Location	Date
Ryan Brooks	Morgantown, WV	2020-11-25
Karen Woodfork	Morgantown, WV	2020-11-25
Paul Sailor	Tulare, US	2020-11-25
Bojan Micic	West Orange, US	2020-11-25
Mayson Lovering	Fitzgerald, US	2020-11-25
Gaby S	Houston, US	2020-11-25
Kiara Wilson	Hatfield, US	2020-11-25
Savannah Rivers	Malone, US	2020-11-25
Mina M	Hemet, US	2020-11-25
Catherine Galarza	Tomball, US	2020-11-25
Sidney Maldonado	Brooklyn, US	2020-11-25
Mariana Razon	Placentia, US	2020-11-25
Paula Hickman	Athens, GA	2020-11-25
Savannah Deniston	La Porte, US	2020-11-25
Jim Bond	mablethorpr, US	2020-11-25
Leah Candace	Kirkland, US	2020-11-25
Drew Peacock	Charlotte, US	2020-11-25
Johanna Rubin	Pittsburgh, US	2020-11-25
Ann Nkole	Lowell, US	2020-11-25
sydney thorne	Peterstown, WV	2020-11-25
Reagan Almaguer	Plano, US	2020-11-25
ethan btyler	Fort Worth, US	2020-11-25

Name	Location	Date
Dalton Priddy	Claremore, US	2020-11-25
Frida Arellano	Schererville, US	2020-11-25
Mary Swim	Morgantown, WV	2020-11-25
Jacob Lysick	Morgantown, WV	2020-11-25
Benjamin Tarkenton	US	2020-11-25
Lizky ITS	Joplin, US	2020-11-25
Dana Jones	Chicago, US	2020-11-25
Elizabeth Murray	Muskego, US	2020-11-25
Katrina Travis	Orlando, US	2020-11-25
jojo k	Lancaster, US	2020-11-25
Patricia Garza	San Antonio, US	2020-11-25
loreta mascioli	morgantown, WV	2020-11-25
Mariela Ramirez	Las Vegas, US	2020-11-25
Maria Martinez	Edinburg, US	2020-11-25
Mareena Tibbetts	Bemidji, US	2020-11-25
Natalia Jurado	Columbus, US	2020-11-25
Robynn Hammers	Huntingdon, US	2020-11-25
Libby Devlin	Doylestown, US	2020-11-25
Joseline Salazar	Fleetwood, US	2020-11-25
Legend Williams	Chicago, US	2020-11-25
Dennis Antunes	Philadelphia, US	2020-11-25
Kaeleigh Parsons	Morgantown, WV	2020-11-25

Name	Location	Date
Jacqueline Alvarez	Oakley, US	2020-11-25
Jean Chagnon	Montréal, US	2020-11-25
Nya Kelly	Hammond, US	2020-11-25
Dahlia Jacobe	Detroit, US	2020-11-25
Haley Tobiasz	Joliet, US	2020-11-25
Zaniah Bagley	Orlando, US	2020-11-25
Taylor Mieszkuc	Port Jervis, US	2020-11-25
-Corinne Schiehser	Bellevue, US	2020-11-25
Ethan Gallagher	Blackwood, US	2020-11-25
ava herren	Gainesville, US	2020-11-25
Alyssa Reilly	Delray Beach, US	2020-11-25
Richie Flores	Bakersfield, US	2020-11-25
Annie Leonhart	Covina, US	2020-11-25
Natalie Bailey	Houston, US	2020-11-25
kale drowns	Greenville, US	2020-11-25
Narges Asadi	New York, US	2020-11-25
Carl Charles	Philadelphia, US	2020-11-25
Zach Cook	Morgantown, WV	2020-11-25
Greg Boyce	Morgantown, WV	2020-11-25
Kate Tanner	Detroit, MI	2020-11-25
L Knight	Morgantown, WV	2020-11-25
Nick Koester	Los Angeles, CA	2020-11-25

Name	Location	Date
Lindsay Jackson	Detroit, MI	2020-11-25
Will Corley	Morgantown, WV	2020-11-25
Chris Brown	Morgantown, WV	2020-11-25
David Connell	Oakland, MD	2020-11-25
James Rector	Morgantown, WV	2020-11-25
Arlo Flanagan	Morgantown, WV	2020-11-25
Ashley Greene	Morgantown, WV	2020-11-25
Vaughn Jones	Morgantown, WV	2020-11-25
Jessica Haring	Morgantown, WV	2020-11-25
Matthew Earle	Newark, DE	2020-11-25
Kyle Starcher	Morgantown, WV	2020-11-25
Thomas Buie	Barnsdall, OK	2020-11-25
Bob Wellagain	Savannah, US	2020-11-25
simone jones	Muskego, US	2020-11-25
Nicoya Srbecky	Denver, US	2020-11-25
Riley Berman	Flower Mound, US	2020-11-25
Samantha Ehrlich	Downingtown, US	2020-11-25
phoenix smith	Akron, US	2020-11-25
Niranjan Nambiar	Madison, US	2020-11-25
Natalie S	Midland, US	2020-11-25
Giselle Ascencio	Bellflower, US	2020-11-25
Tessa Palmer	Canton, US	2020-11-25

Name	Location	Date
Steve Sedlock	Morgantown, WV	2020-11-25
Isabella Flinn	Boxford, US	2020-11-25
Chloe Finger	Lincoln Park, US	2020-11-25
Jade Leon	Upland, US	2020-11-25
Sarah Melanson	Morgantown, WV	2020-11-25
Danica Reaves	Spring, US	2020-11-25
Rheuej Ieeieeieii	Mcallen, US	2020-11-25
hannah hall	Tampa, US	2020-11-25
Nancy Garay	La Puente, US	2020-11-25
Hailey Kenney	US	2020-11-25
Katlyn Sterling	Sherman, US	2020-11-25
Ayla Vandestreek	beaverdam, US	2020-11-25
Melanie Cardenas	Arlington, US	2020-11-25
Cecily Borremans	Dallas, US	2020-11-25
Shaelyn Abadam	Albuquerque, US	2020-11-25
Ellie W	Huntsville, US	2020-11-25
Gaby Munoz	Palos Verdes Peninsula, US	2020-11-25
Katelyn Fuller	Wilmington, US	2020-11-25
sandy nappi	Lanham, US	2020-11-25
Erin Hogan	Manhattan Beach, US	2020-11-25
Angelita Bermudez	Santa Ana, US	2020-11-25
Jose Hernandez	Charlotte, US	2020-11-25

Name	Location	Date
Tobias Lindsay	Memphis, US	2020-11-25
Connie Mccarthy	Las Vegas, US	2020-11-25
Odalys Hernandez	Beaumont, US	2020-11-25
Kennedy Clark	Riverside, US	2020-11-25
Jaye Stevens	Bristol, US	2020-11-25
LiLi Rasekhi	Lovettsville, US	2020-11-25
Anthony Canales	Silver Spring, US	2020-11-25
Melissa Marie Thompson	Jacksonville, US	2020-11-25
Dale Clark	Washington, US	2020-11-25
Harlow Kleffner	Portland, US	2020-11-25
ava cleveland	Waterloo, US	2020-11-25
malaika roomi	Flushing, US	2020-11-25
Ariba Khan	Taunton, US	2020-11-25
katie murphy	Harwich, US	2020-11-25
Leah Shannon	Sammamish, US	2020-11-25
Saya Somera	Los Angeles, US	2020-11-25
Brandy Medlin	springfield, US	2020-11-25
delaney phelps	Carson City, US	2020-11-25
ben calvez	Ridgewood, US	2020-11-25
Stan Kpop	US	2020-11-25
Maya Oliviar	El Paso, US	2020-11-25
Aurora Watt	Surprise, US	2020-11-25

Name	Location	Date
Yazmeen The negro	Cincinnati, US	2020-11-25
Emma Sweat	Kodak, US	2020-11-25
Sherly Chamorro	New Rochelle, US	2020-11-25
Isabella Vogelpohl	Cincinnati, US	2020-11-25
Oma Nelson	El Dorado Hills, US	2020-11-25
Dadoucheka Louissaint	Carmel, US	2020-11-25
Gaby Hernandez	Decatur, US	2020-11-25
Suzanne Keaton	Sandusky, US	2020-11-25
bryhton peoples	Fayetteville, US	2020-11-25
Lucia Del Torto	Cleveland, US	2020-11-25
Soren Mikell	Eugene, US	2020-11-25
Destinee Perez	Phoenix, US	2020-11-25
Olivia Rhyu	Chino Hills, US	2020-11-25
Jefferu Jeffery	Milford, US	2020-11-25
Skylar Snay	Grosse Pointe Park, US	2020-11-25
Charlotte Orahood	Chicago, US	2020-11-25
mariam mkrtchian	North Hollywood, US	2020-11-25
Daniel Landeros	Lompoc, US	2020-11-25
Angel Cruz	San Diego, US	2020-11-25
Markiya Houston	Plymouth, US	2020-11-25
Madison Scherer	Pittsburgh, US	2020-11-25
Alessandro Alba	Irvine, US	2020-11-25

Name	Location	Date
Natalia Baxcajay	Tampa, US	2020-11-25
Caitlin Wilson	New Kensington, US	2020-11-25
Berlinde Denoye	Fort Lauderdale, US	2020-11-25
Patrick Smith	Feasterville Trevose, US	2020-11-25
Connie Rose	Woodbridge, US	2020-11-25
Madeline Gehrlein	Van nuys, US	2020-11-25
leslie barrios	bridgeport, US	2020-11-25
Ivett Husveth	Norwalk, CT	2020-11-25
solei gutierrez	Santa Maria, US	2020-11-25
Fresh mint Kraess	Morgantown, WV	2020-11-25
Bill Bodine	Marksville, LA	2020-11-25
Kari Selin	Morgantown, WV	2020-11-25
Tommy Thompson	Morgantown, WV	2020-11-25
Anthony Kolanko	Morgantown, WV	2020-11-25
Brandon Wise	Morgantown, WV	2020-11-25
Esteban Angel	Fair Lawn, NJ	2020-11-25
Bevin Coffee	Lexington, NC	2020-11-26
Nasr Alkadi	Edmond, OK	2020-11-26
Charles Lewis	Hillsboro, WV	2020-11-26
Ayden Horkovy	New Castle, US	2020-11-26
Emma Bonin	San Diego, US	2020-11-26
Syulita Fletes	Burbank, US	2020-11-26

Name	Location	Date
Kyra Plew	Tampa, US	2020-11-26
Stephanie Eze	McKinney, US	2020-11-26
Ryan T	Matthews, US	2020-11-26
El Chopo	Northfield, US	2020-11-26
mary piddington	Baltimore, US	2020-11-26
Sydney O'Hara	Mentone, US	2020-11-26
Kenny Ndumbe	Rochester, US	2020-11-26
Katherine Martinez	Indianapolis, US	2020-11-26
Terri Wise	Fairmont, WV	2020-11-26
Cathy Hagedorn	Morgantown, WV	2020-11-26
Tara Smith	Morgantown, WV	2020-11-26
Gabe DeWitt	Morgantown, WV	2020-11-26
Patrick Cumashot	Lake tahoe, CA	2020-11-26
Megan Sanfacon	Fort Collins, CO	2020-11-26
Jessica Bello	Philadelphia, PA	2020-11-26
Tristan McQuain	Clarksburg, WV	2020-11-26
Bridgette McQuain	Clarksburg, WV	2020-11-26
Matt Britton	Clarksburg, WV	2020-11-26
Jeff Jordan	Morgantown, WV	2020-11-26
Jon Lane	Morgantown, WV	2020-11-26
Derrick Cabrera	Houston, US	2020-11-26
Ariel Casteel	Morgantown, WV	2020-11-26

Name	Location	Date
Adam McQuain	Clarksburg, WV	2020-11-26
Gabe Melber	Arlington, US	2020-11-26
Trin Satterfield	US	2020-11-26
Maribel Marulanda	New York, US	2020-11-26
Maddy Anyan	Alpharetta, US	2020-11-26
Rielle Tang	Plano, US	2020-11-26
Terrie Williams	Vidor, US	2020-11-26
Piper England	Gonzales, US	2020-11-26
amy huerta	Santa Ana, US	2020-11-26
Jassy Castro	San Antonio, US	2020-11-26
Danielle Harper	Beckley, WV	2020-11-26
Sylvia Byrd	Tampa, FL	2020-11-26
Amanda Shreve	Clarksburg, WV	2020-11-26
C Lane	Morgantown, WV	2020-11-26
Miste Barile	Oakland, MD	2020-11-26
Mary Hurst	Clarksburg, WV	2020-11-26
Eric Clark	Rockville, MD	2020-11-26
Cameron Belldina	Morgantown, WV	2020-11-26
Dawn Brady	Shinnston, WV	2020-11-26
Brittany Tate	Shinnston, WV	2020-11-26
Mark Reynolds	Clarksburg, WV	2020-11-26
Gary Brady	Clarksburg, WV	2020-11-26

Name	Location	Date
Hannah Reynolds	Clarksburg, WV	2020-11-26
Janet Ferraro	Morgantown, WV	2020-11-27
Taylor Voges	Morgantown, WV	2020-11-27
Stacey Friend	Morgantown, WV	2020-11-27
Rachel Pfost	Morgantown, WV	2020-11-27
Zach Trump	Masontown, PA	2020-11-27
Ed Hoskins	Morgantown, WV	2020-11-27
Drema Paugh	1131 Sugar Grove Road, WV	2020-11-27
Larry Shaffer	Kingwood, WV	2020-11-27
Tony Glover	Morgantown, WV	2020-11-27
Verna Howell	Morgantown, WV	2020-11-27
Jerry Howell	Morgantown, WV	2020-11-27
Anthony Miraglilo	Linwood, NJ	2020-11-27
Dwight Pavlovic	Morgantown, WV	2020-11-27
Donna Hosey	Morgantown, WV	2020-11-27
Bethany Royce	Morgantown, WV	2020-11-27
Steven Dunn	Morgantown, WV	2020-11-27
Amy Dalton	Morgantown, WV	2020-11-27
Rhonda Calhoun	Kingwood, WV	2020-11-27
Nick Miraglilo	Northfield, NJ	2020-11-27
Kaitlin Gammack	Morgantown, WV	2020-11-27
Crystal Deavers	Morgantown, WV	2020-11-27

Name	Location	Date
Danette Jones	Kingwood, WV	2020-11-27
Luanna Croston	Reedsville, WV	2020-11-27
Erica Davis	Morgantown, WV	2020-11-27
Amanda Murray	Kingwood, WV	2020-11-27
Carol Aaron	Charleston, WV	2020-11-27
Gloria Nestor	Morgantown, WV	2020-11-27
Shawna Burns	Morgantown, WV	2020-11-27
Ronald Holmes	West Virginia, WV	2020-11-27
Crystal Wilson	Morgantown, WV	2020-11-27
Beverly Brandvold	New Freeport, PA	2020-11-27
Melissa MCDonald	Morgantown, WV	2020-11-27
Amie Perriello	Morgantown, WV	2020-11-27
Melissa Nicholson	Morgantown, WV	2020-11-28
Meahell Watkins	Morgantown, WV	2020-11-28
Tammy Price	Masontown, WV	2020-11-28
Liam Corbin	Morgantown, WV	2020-11-28
Sarah Anderson	Pittsburgh, PA	2020-11-28
Sarah Anderson	Morgantown, US	2020-11-28
Olivia Grunau	Morgantown, WV	2020-11-28
Jay Richard	Morgantown, WV	2020-11-28
Anna Butcher	Morgantown, WV	2020-11-28
Jack Mullenix	New York, NY	2020-11-28

Name	Location	Date
Michael Gorham	Morgantown, WV	2020-11-28
Michaela Dacey	Bridgeport, CT	2020-11-28
Leigh Anne Keener	Morgantown, WV	2020-11-28
Kathy Andrews	Morgantown, WV	2020-11-28
Craig White	Morgantown, WV	2020-11-28
Alex Hines	Morgantown, WV	2020-11-28
Hannah Adkins	Bronx, NY	2020-11-28
Mike Nicholson	Morgantown, WV	2020-11-28
Rachel Robinette	Morgantown, WV	2020-11-28
Lisa Harvey	Oakland, MD	2020-11-28
Susan Morton	Morgantown, WV	2020-11-28
Rick Landenberger	Morgantown, WV	2020-11-28
Amy McGowan	Masontown, WV	2020-11-28
Anna Sisler	Morgantown, WV	2020-11-28
Kathy Jesperson	Morgantown, WV	2020-11-28
Karen Dunham	Morgantown, WV	2020-11-28
Kamdyn Beal	Texarkana, US	2020-11-28
Maritza Ortiz	Umatilla, US	2020-11-28
kelsey ouellette	Ludlow, US	2020-11-28
penis head	New Rochelle, US	2020-11-28
Zan Santon	Lafayette, IN	2020-11-28
Terri Rodriguez	Pensacola, US	2020-11-28

Name	Location	Date
Amanda Babineau	Waltham, US	2020-11-28
Matthew Clark	Tornado, US	2020-11-28
Ashlee Walls	Morgantown, WV	2020-11-28
John Poling	Morgantown, WV	2020-11-28
Jennifer Jones	Morgantown, WV	2020-11-28
Barbara Watkins	Morgantown, WV	2020-11-28
Nicholas Stamm	Morgantown, WV	2020-11-28
Joanne Pollitt	Morgantown, WV	2020-11-29
Carlee Bunner	US	2020-11-29
Chloe Grady	Warsaw, US	2020-11-29
Isis Conroy	Tampere, Finland	2020-11-29

Appendix D: NRCS Consultation and Farmland Protection Policy Act Assessment

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

March 31, 2021

Tim Dilliplane
North Area Resource Soil Scientist
USDA Natural Resources Conservation Service
MLRA Soil Survey Office
201 Scott Avenue
Morgantown, WV 26505

Dear Mr. Dilliplane:

State Project: U331-857-0.67
Federal Project: STP-0857(019)D
Greenbag Road Improvement Project
Monongalia County

Thank you for your review of the proposed Greenbag Road Improvement Project and its potential to impact prime or other important farmland within Monongalia County and the City of Morgantown. We have completed the remaining fields of the CPA-106 form and determined the following:

- The total corridor assessment value result for Part VI is 60 points out of a possible maximum of 160 points.
- The total point value for Part VII is 65 points out of a possible maximum of 260 points.

It is our understanding that sites receiving a total score of less than 160 under Part VI, as the Greenbag Road Improvement Project does, need not be given further consideration for protection and no additional sites need to be evaluated. At your convenience, please confirm if the USDA-NRCS is in agreement with this conclusion, or if any additional information is otherwise required. An FPPA Cover Sheet summary, the CPA-106 form, and a criteria point justification summary is attached to this letter for your reference.

Should you have any questions, please contact Ms. Sydney Burke at (304) 414-6420 or by email at Sydney.T.Burke@wv.gov. Thank you very much.

Very truly yours,

Ben L.Hark

Digitally signed by Ben L.Hark
DN: C=US, E=Ben.L.Hark@wv.gov, O=WVDOH - Engineering Division, OU="Environmental ", CN=Ben L.Hark
Date: 2021.03.31 14:26:00-04'00'

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
bcc: DDE(SB)
Enclosures

Greenbag Road Improvement Project
City of Morgantown, Monongalia County, West Virigina

FPPA Soils

The Farmland Protection Policy Act (FPPA) Farmland Conversion Impact Rating (Form CPA-106) for Corridor Projects has been prepared for the proposed project. The Site Assessment score for Part VI was calculated to be 60 points, which is below the 160 points that requires additional consideration for other alternatives (per § 658.4 of the FPPA Rule, 7 CFR 658). Therefore compliance with the FPPA has been achieved. A copy of the FPPA Form and the Rationale for Evaluation are attached.

FPPA soils that are located within the project area are listed below, along with impact estimates based on the proposed Right-of-Way of the selected alternative.

- Prime Farmland soils (3.0 total acres impacted):
  - Lobdell silt loam, 0 to 3 percent slopes, occasionally flooded (Lb)
- Farmland of Statewide Importance soils (5.98 total acres impacted):
  - Clarksburg silt loam, 15 to 25 percent slopes (CkD)
  - Clarksburg silt loam, 8 to 15 percent slopes (CkC)
  - Gilpin-Culleoka-Upshur silt loams, 15 to 25 percent slopes (GuD)
  - Gilpin-Culleoka-Upshur silt loams, 8 to 15 percent slopes (GuC)
  - Lobdell-Holly silt loams (Lh)
  - Zoar silt loam, 3 to 8 percent slopes (ZoB)
  - Zoar silt loam, 8 to 15 percent slopes (ZoC)

A total of 8.98 acres of FPPA soil will be directly impacted by the proposed project.

Land use in the immediate vicinity of the project corridor is primarily commercial and residential. There is active agricultural use in the southeastern region of the corridor that will be directly converted to non-agricultural use.

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **3/17/21**	4. Sheet 1 of **1**
1. Name of Project **WVDOH Greenbag Rd Improvements**	5. Federal Agency Involved **FHWA**	
2. Type of Project **Widening, intersection improvements**	6. County and State **Monongalia County, WV**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS **3/23/21**	2. Person Completing Form **Tim Dilliplane**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated **0** / Average Farm Size **127**
5. Major Crop(s) **corn**	6. Farmable Land in Government Jurisdiction Acres: **156,125** % **67**	7. Amount of Farmland As Defined in FPPA Acres: **92,180** % **39**
8. Name Of Land Evaluation System Used **LESA**	9. Name of Local Site Assessment System **none**	10. Date Land Evaluation Returned by NRCS **3/25/21**

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment 2/C/F			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly	**8.98**			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	**0**			
C. Total Acres In Corridor	**49.33**			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	**0**			
B. Total Acres Statewide And Local Important Farmland	**4**			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	**.001**			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	**60%**			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	5			
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — **Maximum Points**				
1. Area in Nonurban Use — **15**	7			
2. Perimeter in Nonurban Use — **10**	2			
3. Percent Of Corridor Being Farmed — **20**	0			
4. Protection Provided By State And Local Government — **20**	0			
5. Size of Present Farm Unit Compared To Average — **10**	2			
6. Creation Of Nonfarmable Farmland — **25**	25			
7. Availablility Of Farm Support Services — **5**	4			
8. On-Farm Investments — **20**	20			
9. Effects Of Conversion On Farm Support Services — **25**	0			
10. Compatibility With Existing Agricultural Use — **10**	0			
TOTAL CORRIDOR ASSESSMENT POINTS — **160**	**60**	**0**	**0**	**0**
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — **100**	**5**	**0**	**0**	**0**
Total Corridor Assessment (From Part VI above or a local site assessment) — **160**	**60**	**0**	**0**	**0**
TOTAL POINTS *(Total of above 2 lines)* — **260**	**65**	**0**	**0**	**0**

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
Corridor A	Actively Farmed area: 2.16 acres Prime farmland soil: 3.0 acres Farmland soil of statewide importance: 5.9 acres		YES ☐ NO ☒

5. Reason For Selection:

The alternative selected meets the purpose and need for the project, has zero residential displacements, and meets the WVDOH criteria for level of service for the design year.

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

Farmland Conversion Impact Rating
Rationale for Evaluation
Greenbag Road Improvement Project
City of Morgantown, Monongalia County, West Virginia

1. Area in Non-urban Use

   Based on the U.S. Census Bureau Urbanized Area dataset (2018), a review of the Morgantown North and Morgantown South West Virginia USGS 7.5 Minute Quadrangles, site visits, and online aerial mapping, it was determined that approximately 60% of the land located within a one-mile radius of the project is in non-urban use.

   Rating – 7 points

2. Perimeter in Non-urban Use

   Based on the U.S. Census Bureau Urbanized Area dataset (2018), a review of the Morgantown North and Morgantown South West Virginia USGS 7.5 Minute Quadrangles, site visits, and online aerial mapping, it was determined that approximately 25% of the perimeter that borders the site is in non-urban use.

   Rating – 2 points

3. Percent of Corridor Being Farmed (more than five of the last ten years)

   Based on site visits, the City of Morgantown's zoning map, review of current and historical aerial imagery, and additional online mapping sources, a conservative estimate for the percent of the corridor that has been farmed for at least five of the past ten years was determined to be 15% of the project environmental study area.

   Rating – 0 points

4. Protection Provided by State and Local Government

   The project area is within the jurisdictions of Monongalia County and the City of Morgantown. There are no policies or programs for the protection of farmland within the project area based on a review of the City of Morgantown's zoning map and Code of Ordinances, the Monongalia County website, and the West Virginia Farmland Protection website.

   Rating – 0 points

5. Size of Present Farm Unit Compared to Average

   Based on Part II, #4 of the CPA-106 Form and the 2012 USDA Census of Agriculture County Profile (https://www.nass.usda.gov/ Publications/AgCensus/ 2017/Online_Resources/County_Profiles/West_Virginia/cp54061.pdf), the

average farm size within Monongalia County is 127 acres. According to the Monongalia County Parcel Mapper, the largest active farming operation that overlaps with the project study area is 77.07 acres, which is approximately 40% smaller than the average for the County.

Rating – 2 points

6. Creation of Non-Farmable Farmland

The project will result in a substantial impact to one of the two farming operations present within the project area. Approximately 2/3 of the active farming operation present in the southwest quadrant of the Greenbag Road / Dorsey Avenue / Kingwood Pike intersection will be directly impacted by the realignment of Kingwood Pike and a proposed roundabout at the intersection. Furthermore, the proposed project will impact the existing driveway (off of Greenbag Road) that is currently used to access this site. Therefore, it is unlikely that farming operations will continue at this location.

In addition, minor strip takes of additional right-of-way will be required from the Thomas E. Richards Trust Farm operation located on the south side of Greenbag Road and east of Kingwood Pike. Overall, these minor impacts will not affect the overall farming operations at this farm.

The total farmed acreage that will be lost from the site in the southwest quadrant of the Greenbag Road / Dorsey Avenue / Kingwood Pike intersection is 3.3 acres, and the selected alternative is expected to require 8.98 acres of right-of-way acquisition. Therefore, the impact associated with this metric is approximately 37%, or 25 points.

Rating – 25 points

7. Availability of Farm Support Services and Markets

Some farm support services, including Southern States Morgantown Cooperative, Morgantown Power Equipment Inc. and other equipment dealers, Tractor Supply, and a farmer's market are available within five miles of the project site. Based on public involvement activities that occurred through project development, some restaurants in Morgantown seek out locally sourced produce. Farm processing and storage facilities are not evident within five miles of the project area.

Rating – 4 points

8. On Farm-Investments

The areas used for agricultural purposes that overlap with the project area are well-maintained and contain on-farm investments. According to comments received during public involvement activities associated with the project, the land in the southwest quadrant of the Greenbag Road / Dorsey Avenue / Kingwood Pike intersection includes the following investments:

- A fence along the community garden was created with donated funds,
- Improvements to the driveway off of Greenbag Road and gravel parking lot occurred with earned funds and volunteer labor,
- Perennial plants that were purchased with donated and earned funds, including, but not limited to, fig trees that require years of growth before fruiting and hemp plants. Impacts to these investments may occur depending on their locations.
- A pole barn located along the tree line was built with a substantial amount of donated and earned funds and volunteer labor. The structure is used to provide shelter for businesses associated with the property and during fundraising activities.
- A tool shed along the tree line was built with donated and earned funds and includes a mural on the side of the shed that was created by volunteers and local artists.

On-farm investments associated with the Thomas E. Richards Trust Farm operation south of the Greenbag Road corridor and east of Kingwood Pike include a fence (which will be directly impacted by the proposed project) and a large barn / storage facility (which will not be impacted by the proposed project).

Rating – 20 points

9. Effects of Conversion on Farm Support Services

The proposed Greenbag Road Improvements project will not cause a significant reduction in demand for farm support services if the site is converted.

Rating – 0 points

10. Compatibility with Existing Agricultural Use

The Greenbag Road Project proposes improvements to an existing transportation facility in response to area growth and development that is currently occurring. Therefore, interference with land patterns will not occur, and the project will not induce land use change or have any indirect impacts to remaining farmland not directly impacted by the project.

Rating – 0 points

USDA
United States Department of Agriculture
Natural Resources Conservation Service
1550 Earl Core Road, Suite 200
Morgantown, WV 26505
(304) 284-7540 (Phone)
(855) 857-6448 (Fax)

March 25, 2021

Sydney T Burke, Project Manager
WV DOT Division of Highways
1900 Kanawha Blvd East Suite 100
Charleston WV 25305-0430

RE: Greenbag Road Improvement Project; Monongalia County, WV

Ms. Burke,

This is to acknowledge receipt of your request for evaluation of important farmland related to the above referenced project in Monongalia County, WV. This important farmland information was requested in order for you to assess the environmental impacts of the proposed project in accordance with the National Environmental Policy Act.

The Farmland Protection Policy Act (FPPA – Public Law 97-98, 7 U.S.C. 4201) established the farmland conversion rating system to evaluate the impacts Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are implemented or assisted by a Federal agency. Assistance from a Federal agency includes loans, financial and technical assistance.

Based on a review of the submitted documents, aerial photography, and the soil survey mapping it is determined that this project **does** impact prime or other important farmland, and is therefore subject to Farmland Protection Policy Act.

If you have any questions regarding this determination, please contact Tim Dilliplane, NRCS Resource Soil Scientist at 304-291-4377 x152.

Respectfully,

Tim Dilliplane
NRCS Resource Soil Scientist

Attachment: NRCS-CPA-106

Cc: Dustin Adkins, District Conservationist, NRCS, White Hall, WV

Mr. Ben L Hark, Section Head, WVDOT Division of Highways

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **3/17/21**	4. Sheet 1 of **1**
1. Name of Project **WVDOH Greenbag Rd Improvements**	5. Federal Agency Involved **FHWA**	
2. Type of Project **Widening, intersection improvements**	6. County and State **Monongalia County, WV**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS **3/23/21**	2. Person Completing Form **Tim Dilliplane**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated **0** / Average Farm Size **127**
5. Major Crop(s) **corn**	6. Farmable Land in Government Jurisdiction Acres: **156,125** % **67**	7. Amount of Farmland As Defined in FPPA Acres: **92,180** % **39**
8. Name Of Land Evaluation System Used **LESA**	9. Name of Local Site Assessment System **none**	10. Date Land Evaluation Returned by NRCS **3/25/21**

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment 2/C/F			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly	**8.98**			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	**0**			
C. Total Acres In Corridor	**49.33**			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	**0**			
B. Total Acres Statewide And Local Important Farmland	**4**			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	**.001**			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	**60%**			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	5			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	**Maximum Points**				
1. Area in Nonurban Use	**15**				
2. Perimeter in Nonurban Use	**10**				
3. Percent Of Corridor Being Farmed	**20**				
4. Protection Provided By State And Local Government	**20**				
5. Size of Present Farm Unit Compared To Average	**10**				
6. Creation Of Nonfarmable Farmland	**25**				
7. Availablility Of Farm Support Services	**5**				
8. On-Farm Investments	**20**				
9. Effects Of Conversion On Farm Support Services	**25**				
10. Compatibility With Existing Agricultural Use	**10**				
TOTAL CORRIDOR ASSESSMENT POINTS	**160**	**0**	**0**	**0**	**0**
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	**100**	**5**	**0**	**0**	**0**
Total Corridor Assessment (From Part VI above or a local site assessment)	**160**	**0**	**0**	**0**	**0**
TOTAL POINTS *(Total of above 2 lines)*	**260**	**5**	**0**	**0**	**0**

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

Byrd E. White, III
Secretary of Transportation/
Commissioner of Highways

Jimmy Wriston, P. E.
Deputy Secretary/
Deputy Commissioner

March 17, 2021

Mr. Jared Beard
West Virginia State Soil Scientist, FPPA Contact
USDA Natural Resources Conservation Service
1550 Earl Core Road, Suite 200
Morgantown, West Virginia 26505

Dear Mr. Beard:

State Project: U331-857-0.67
Federal Project: STP-0857(019)D
Greenbag Road Improvement Project
Monongalia County

Please find attached for your review a location map and CPA-106 form for the above referenced project. We believe the project to be exempt from the Farmland Protection Policy Act (FPPA) based on its location within a United States Census Bureau-designated urbanized area. We request your confirmation of the exemption and any input or concerns your office may have regarding this project.

The proposed project consists of the widening Greenbag Road lanes and providing intersection improvements at the Mississippi Street (CR 857/1) and Dorsey Avenue/ Kingwood Pike (CR81) intersections. The entire project length is approximately 1.65 miles in length and involves the replacement of one culvert structure over Cobun Creek.

Should you have any questions, please contact Ms. Sydney Burke at (304) 414-6420 or by email at Sydney.T.Burke@wv.gov. Thank you very much.

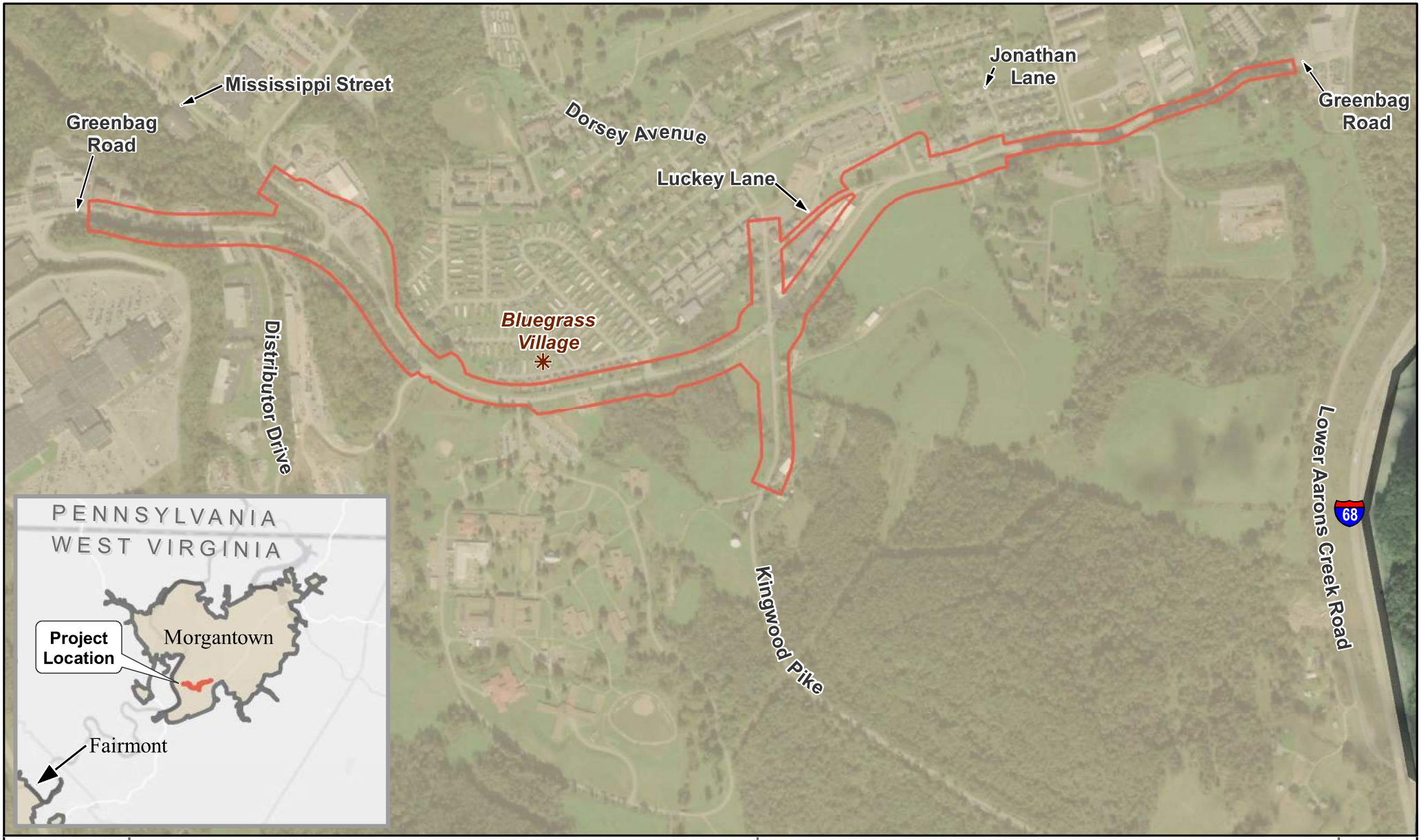
Very truly yours,

Ben L.Hark

Digitally signed by Ben L.Hark
DN: C=US, E=Ben.L.Hark@wv.gov, O=WVDOH - Engineering Division, OU="Environmental ", CN=Ben L.Hark
Date: 2021.03.17 15:58:59-04'00'

Ben L. Hark
Section Head
Environmental Section
Engineering Division

H:s
bcc: DDE(SB)
Enclosures



Greenbag Road Improvement Project

U.S. Census Urban Area Map

West Virginia Division of Highways
Federal Project STP-0857(019)D/State Project U331-857-0.67 00
Greenbag Road Improvement

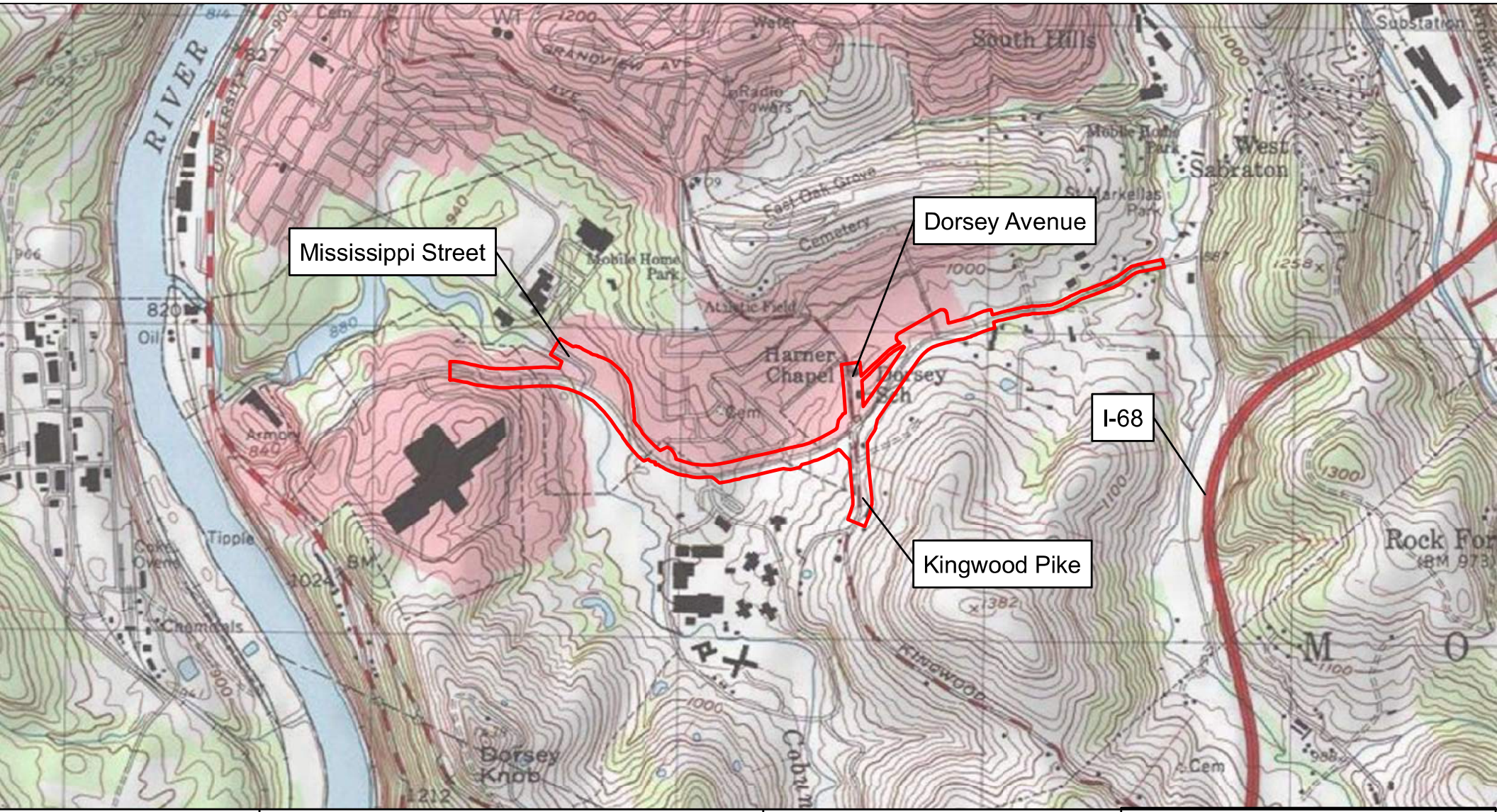
Data Sources: ESRI (2018), USCB (2018)

Environmental Study Area

U.S. Census Bureau Urban Area

0 500 1,000 2,000 Feet

N



West Virginia Division of Highways
Federal Project NFA 2317(022)D
State Project U331-857-0.67 00
Greenbag Road Improvement
Project Location Map

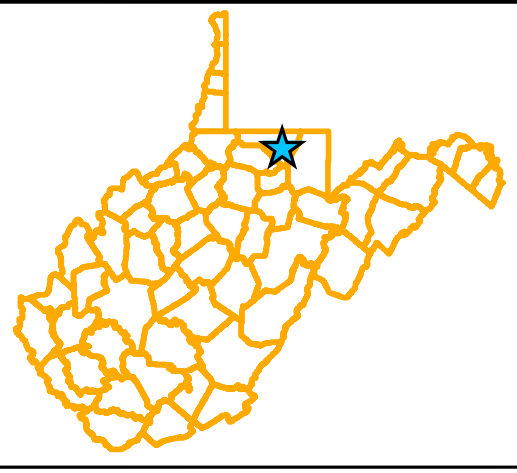
Topography Source: National Geographic Society (NGS)

Environmental Study Area

N
W E
S

0 1,000 2,000 4,000 Feet

0 350 700 1,400 Meters



U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request **3/17/21**	4. Sheet 1 of **1**
1. Name of Project **WVDOH Greenbag Rd Improvements**	5. Federal Agency Involved **FHWA**	
2. Type of Project **Widening, intersection improvements**	6. County and State **Monongalia County, WV**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated / Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction **Acres:** **%**	7. Amount of Farmland As Defined in FPPA **Acres:** **%**
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment 2/C/F			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly	**8.98**			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	**0**			
C. Total Acres In Corridor	**49.33**			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — **Maximum Points**				
1. Area in Nonurban Use — **15**				
2. Perimeter in Nonurban Use — **10**				
3. Percent Of Corridor Being Farmed — **20**				
4. Protection Provided By State And Local Government — **20**				
5. Size of Present Farm Unit Compared To Average — **10**				
6. Creation Of Nonfarmable Farmland — **25**				
7. Availablility Of Farm Support Services — **5**				
8. On-Farm Investments — **20**				
9. Effects Of Conversion On Farm Support Services — **25**				
10. Compatibility With Existing Agricultural Use — **10**				
TOTAL CORRIDOR ASSESSMENT POINTS — **160**	**0**	**0**	**0**	**0**
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — **100**	**0**	**0**	**0**	**0**
Total Corridor Assessment (From Part VI above or a local site assessment) — **160**	**0**	**0**	**0**	**0**
TOTAL POINTS *(Total of above 2 lines)* — **260**	**0**	**0**	**0**	**0**

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

Appendix E: Agency Consultation

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Elkins Operations Center
738 Ward Rd., PO Box 67
Elkins, WV 26241
Telephone 304-637-0245
Fax 304-637-0250

Stephen S. McDaniel
Director

September 28, 2020

Mr. R.J. Scites, Director of Engineering
Division of Highways
1334 Smith Street
Charleston, WV 25301

Re: Environmental Assessment (EA) U331-857-0.67
Greenbag Road (CR 857)
Morgantown, Monongalia County

Dear Mr. Scites:

The West Virginia Division of Natural Resources (WVDNR) Wildlife Resources Section has reviewed the Environmental Assessment (EA) U331-857-0.67 for 1.65 miles of the Greenbag Road (CR 857) operational improvement project in Morgantown, Monongalia County.

The WVDNR concurs that the EA has adequately addressed all significant environmental issues related to wildlife resources. WVDNR will provide additional comments on the 401 Water Quality Certification and looks forwards to working with the Division of Highways on the completion of this project.

If you have further questions, please contact Anne Wakeford of my staff in Elkins my telephone at 304-637-0245 or email at Anne.M.Wakeford@wv.gov.

Regards,

Danny Bennett

Danny A. Bennett, Supervisor

From: Burke, Sydney T <Sydney.T.Burke@wv.gov>
Sent: Friday, October 30, 2020 8:10 AM
To: Hark, Ben L; Mullins, Sondra L; Cummings, Traci L
Cc: Karen Reed
Subject: FW: [External] Greenbag Road Improvement Project EA

These comments look a lot like the ones we got on the Culloden EA. I think we can look at those responses to get a start on these.

From: Okorn, Barbara <Okorn.Barbara@epa.gov>
Sent: Thursday, October 29, 2020 5:03 PM
To: Burke, Sydney T <Sydney.T.Burke@wv.gov>; Balthazar, Austen (FHWA) <austen.balthazar@dot.gov>
Subject: [External] Greenbag Road Improvement Project EA

CAUTION: External email. Do not click links or open attachments unless you verify sender.

Austen and Sydney,

The U.S. Environmental Protection Agency (EPA) Region 3 has received and reviewed the August 2020 Environmental Assessment (EA) for the Greenbag Road Improvement Project in Monongahela County, West Virginia. The EA was done in compliance with the National Environmental Policy Act (NEPA) of 1969 and Council on Environmental Quality (CEQ) regulations implementing NEPA. The West Virginia Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), proposes to provide operational improvements along 1.65 miles of Greenbag Road (CR 857), located southeast of the City of Morgantown in Monongalia County. The EA states that this Project is being undertaken to reduce traffic congestion and address the lack of safe non-motorized connections through the corridor. While we appreciate the abbreviated format of the EA, the document may benefit from more discussion of the analysis used to determine the preferred alternative. Based on our review of the EA, we offer the following comments for consideration.

Purpose and Need
The EA presents an overview of various studies for the Greenbag Road corridor, particularly information from the Morgantown Monongahela Metropolitan Planning Organization (MMMPO). The EA would benefit from a more detailed description of how the various studies were considered in the development of the project purpose and need and alternatives assessment, and the traffic data that supported planning visions. Traffic data may include vehicular accidents and pedestrian usage; providing current conditions and objectives may be used to validate/confirm the project improvement(s). A clear objective and problem statement will assist in determining alternatives that best meet the area need.

Alternatives

We recommend the EA clarify how pedestrian/bike traffic will flow in the project area and navigate the proposed roundabout. The EA would benefit from data and explanation of safety advantages with the proposed roundabout design. It is suggested that the EA provide additional information with consideration to the Alternatives requiring traffic lights (enforceable with traffic cameras) and expanded access to bicycle, electric vehicles (for the handicap) and pedestrian usage.

Natural Resources

We suggest the EA describe the potential increased stormwater impacts and discuss in more detail how stormwater from the existing road and proposed project will be managed. Opportunities to address storm water impacts by pursuing off-site Best Management Practices (BMP) in the upper watersheds of the proposed project may be available, as well as locations within the project area.

Community Impacts

- We recommend a robust public coordination program throughout construction that includes, but is not limited to, communicating detours and traffic disruptions. We also recommend avoiding and/or minimizing construction impacts including, but not limited to, light, noise, dust, and time of construction work.
- We suggest the EA describe the community impacts as a result of the completed preferred alternative. For example, will the completed project impact residents by having increased truck traffic, more lighting, fewer buffers from road, etc? The EA mentions concerns residents have about tree removal and lighting being added.
- The EA should include Executive Order (E.O.) 13045 - Protection of Children from Environmental Health Risks and Safety Risks.
- It is noted that there are a number of Title VI Resources listed in the document. But it is unclear if they are recipients of Federal Funds. Please explain their status in the EA.
- The Environmental Justice (EJ) benchmarks should be clearly defined. It may be helpful, for example to select the state average as the benchmark value, or the lowest benchmarking value for each of the criteria as a way of making the benchmarking process clear and consistent. There appear to be populations of concern that are missed in the assessment. Tables 2, 3 and 4 should be revised to reflect this consideration. It appears that all six block groups are of potential EJ concern. EPA would be pleased to discuss this methodology and evaluation at your convenience.

Other Impacts

- We suggest that the EA evaluate potential adverse impacts to resources, from past, current and foreseeable future activities. Beyond regulatory protections, it may be helpful to identify any activities or mitigative actions that may improve resource condition.
- The EA mentions that utilities will need to be relocated. We suggest additional discussion be provided related to impacts associated with these relocations.
- The EA states that there will be no effect on air quality. If a beneficial effect is anticipated from reduction of truck traffic or improved non-motorized mobility, it is suggested information could be provided. Please feel free to reach out to EPA to discuss air quality assessment.

Thank you for the opportunity to review the EA. Please let me know if you have any questions.
Barb

Barbara Okorn
Office of Communities, Tribes, & Environmental Assessment
US EPA, Region III
1650 Arch Street (3RA10)
Philadelphia, PA 19103
215-814-3330

Appendix F: Community Garden Proposal

Introduction

As part of the implementing the Morgantown Monongalia Metropolitan Planning Organization's (MMMPO) Transportation Plan, the West Virginia Department of Transportation-Division of Highways (WVDOH) is preparing to improve the operation of Greenbag Road by widening the road, adding sidewalk and installing roundabouts at two poorly performing intersections. This project will necessitate the elimination of an existing community garden that serves the residents of the surrounding area.

Seeking ways to mitigate this impact, WVDOH contacted the MMMPO and the West Virginia University Center for Resilient Communities (WVU CRC) for their assistance in identifying ways to mitigate the impact of the construction on the community. The MMMPO identified that a broad-based effort was needed to identify an effective mitigation strategy. Working with the WVU CRC, the MMMPO contacted several other interested parties to develop a strategy to mitigate the impact of the Greenbag Road project. This proposal was prepared as a cooperative effort with the WVU Center for Resilient Communities, the WVU Campus Garden, the City of Morgantown, the Monongalia County Commission and the MMMPO.

Problem Statement

The population of the Morgantown urban area has the following issues that make community gardens an important asset to the community.

-There is an unprecedented need countywide for food due to the high number of food insecure families and individuals in the community. As an example, in one day an area food bank provided food to over 300 families. These families and individuals have a particular need for fresh vegetables and fruit. These needs are consistent with the State of West Virginia's ranking as 47th in food insecurity of the 50 US states and its high obesity rate.

-The area around downtown Morgantown is a food desert. The central core of the urban area does not have a ready source of fresh vegetables or fruit.

-The loss of the gardening space on Greenbag Road is difficult to replace because that location is one of the few large plots of suitable land for gardening available in that area.

Proposal

In order to address the need for more community gardens, the partnering agencies are proposing to create a community garden pilot program proposed to be known as the "Morgantown Area Community Garden Initiative." This program will establish garden spaces within the City of Morgantown and the surrounding urbanized area of Monongalia County. The Morgantown Area Community Garden Initiative will provide funding to individual organizations through a competitive application process to be run by the City of Morgantown in cooperation with Monongalia County through the Morgantown Monongalia MPO.

Initiative Goals/Objectives

1) Establish a public gardening space at Hazel's House of Hope, a resource center for the clientele of social service agencies. This facility would be separate from the facility's therapeutic rehabilitation garden. Establishing the initial gardening space at this particular location would expose the clientele of the social service agencies to the idea of community gardening, and they would be able to participate in a community garden at a location they are familiar with.

2) To initiate the establishment of community gardens throughout the urban area to provide fresh fruit and vegetables to individuals who have limited home gardening space. This would also begin to address the issue of the urban area's "food desert."

3) To increase awareness of general food insecurity and the need for local food economies. This will greatly strengthen community resilience.

4) To educate the general public on sustainability and gardening including urban farming techniques. Participants will learn to establish and maintain healthy plants in a garden setting by preparing soils, monitoring water and nutrient needs, and organically managing pests and plant disease. Biodiversity of the garden space will be prioritized. Participants will also be educated on agribusiness concepts, as well as gardening best practices. Ultimately, it is proposed to move the gardens in the program to being self-sustaining with a reduced ecological impact.

It is proposed that the initial phase of the pilot program will be implemented with $15,000 from WVDOH to be distributed to at least three (3) community organizations, individuals, or groups who will be awarded up to $5,000 to meet the goals noted above.

Awardees will be required to meet reporting requirements and to present a progress report on their activities and the status of the garden to the community garden selection board, MMPO representatives and representatives of the City of Morgantown, the Monongalia County Commission, or the appropriate municipality depending on the location of the garden.

Conclusion

This proposal requests funding from the West Virginia Department of Transportation-Division of Highways for mitigation of the lost community garden on Greenbag Road. This funding will not only serve to mitigate the loss of one gardening space, it will also serve to provide for the creation of more gardens through the Morgantown Area Community Garden Initiative. After the demonstration of the viability of this concept through this pilot program the City of Morgantown, Monongalia County, and/or other partners may consider funding the project after the establishment of the three gardens proposed in this application.

A sample budget for a $5,000 grant is provided below:

Garden construction (Raised garden bed supplies, garden shed materials): $2,000

Soil and amendments: $1,000

Fencing, signs, labels, miscellaneous garden supplies: $1,500

Supplies for produce harvesting/packaging: $250

Plant and seeds: $250

Total:$5,000

Actual expenditures to establish a garden would depend on the applicants proposed budget but they would not exceed $5,000 per garden and could include other items such as connecting to a water source.