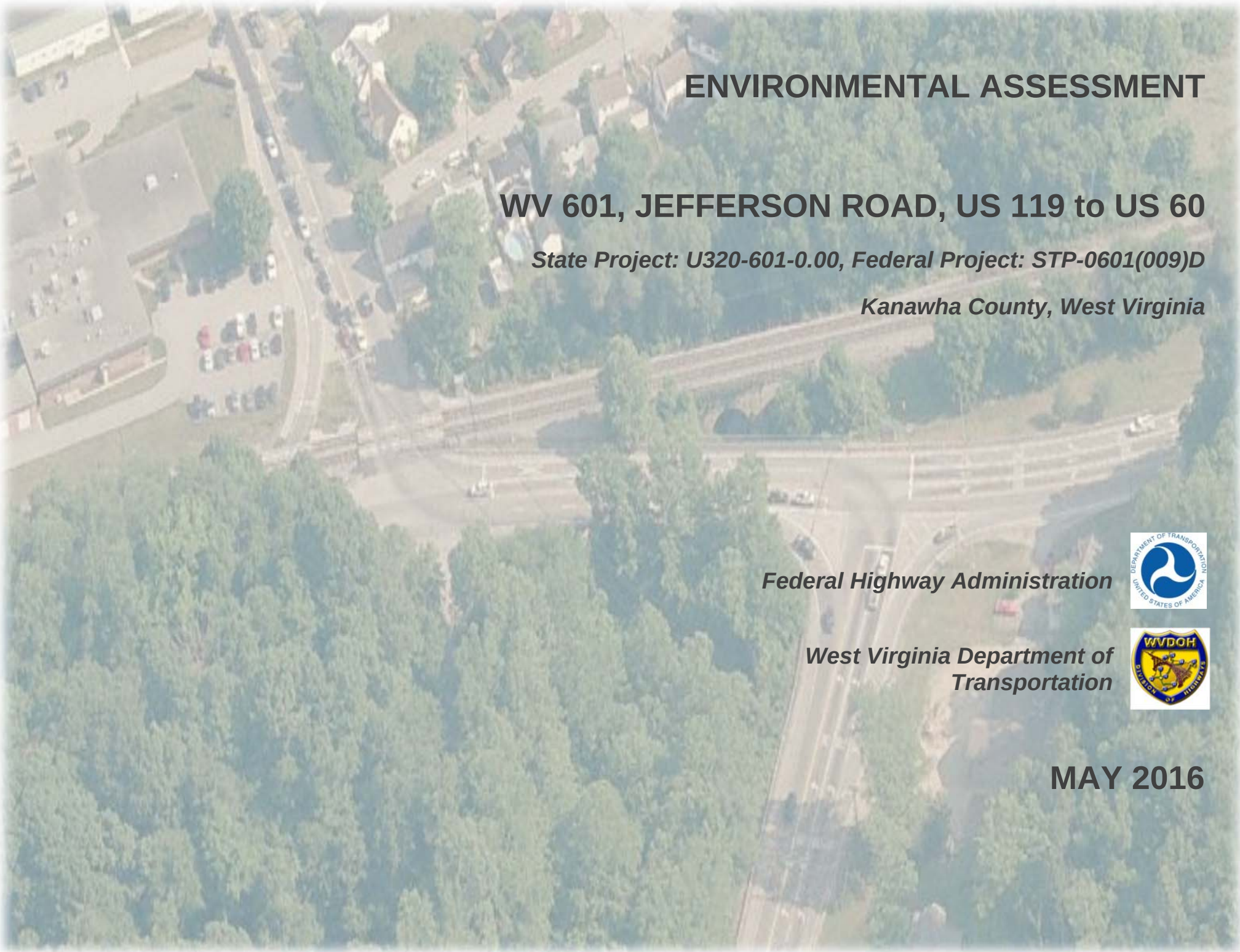


ENVIRONMENTAL ASSESSMENT

WV 601, JEFFERSON ROAD, US 119 to US 60

State Project: U320-601-0.00, Federal Project: STP-0601(009)D

Kanawha County, West Virginia

Federal Highway Administration

West Virginia Department of Transportation

MAY 2016

APPROVAL SIGNATURES

WV 601 JEFFERSON ROAD, US 119 TO US 60

KANAWHA COUNTY, WEST VIRGINIA

STATE PROJECT U320-601-0.00 / FEDERAL PROJECT NO. STP-0601(009)D

ENVIRONMENTAL ASSESSMENT

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

Paul A. Mattox, Jr. — 5/6/16

For West Virginia Department of Transportation — Date of Approval

Jan L Fisher — 6/7/16

For Federal Highway Administration — Date of Approval

The proposed project consists of the realignment and upgrade from two lanes to four and five lanes of a 1.6-mile section of WV 601 (Jefferson Road) between US 119 (Corridor G-Davis Creek Interchange) and US 60 (MacCorkle Avenue) in South Charleston, West Virginia.

FOR INFORMATION CONTACT

Mr. Ben Hark
Environmental Section Head, Engineering Division
West Virginia Division of Highways
1334 Smith Street
Charleston, WV 25301

Mr. Jason Workman
Director, Program Development
Federal Highway Administration
Geary Plaza, Suite 200
700 Washington Street, East
Charleston, WV 25305

PUBLIC COMMENT PERIOD

Comments on this document are due August 11, 2016. Written comments on this document can be submitted through the engineering project website (http://go.wv.gov/dotcomment) or by mail to the following address:

Mr. R.J. Scites, P.E.
Director, Engineering Division, WVDOH
West Virginia Division of Highways
1334 Smith Street
Charleston, WV 25301

CONTENTS

TABLES

FIGURES

APPENDICES (CONTAINED ON DISC IN BACK OF DOCUMENT)

Appendix A: Planning and Environmental Linkage Report

Appendix B: Detailed Alternatives Analysis (including 2015 Traffic Study)

Appendix C: Environmental Justice Analysis Report

Appendix D: Letters from the US Fish and Wildlife Service and WV Division of Natural Resources

Appendix E: State Historic Preservation Office Concurrence Letters

Appendix F: Air Quality Report

Appendix G: Noise Impact Analysis

Appendix H: Hazardous Materials Report

LIST OF ACRONYMS

BMP	best management practice
CFR	Code of Federal Regulations
CLOMR	Conditional Letter of Map Revision
CWA	Clean Water Act
EA	Environmental Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
L&WCF	Land and Water Conservation Fund
LOS	Level of Service
MS4	Municipal Separate Storm Sewer System
PEL	Planning and Environmental Linkage
RIC	Regional Intergovernmental Council
SHPO	State Historic Preservation Office
sq ft	square feet
STIP	Statewide Transportation Improvement Program
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
USACE	United State Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
VMT	Vehicle-miles Traveled
WVDEP	West Virginia Department of Environmental Protection
WVDNR	West Virginia Division of Natural Resources
WVDOH	West Virginia Division of Highways
WVDOT	West Virginia Department of Transportation

What is the Proposed Project?

The West Virginia Department of Transportation, Division of Highways (WVDOH), in cooperation with the Federal Highway Administration (FHWA), is proposing improvements to an approximately 1.7-mile section of Jefferson Road (WV 601) in Kanawha County between its intersection with US 60 (MacCorkle Avenue) in the north and its intersection with US 119 (Corridor G – Davis Creek Interchange) in the south (Figure 1 and Figure 2). The improvements will relieve current and future traffic congestion and improve safety in the corridor.

Jefferson Road serves as a major connector between the communities and businesses west of the capital city (Charleston) and those south of the city. In the north end of the Project Area, there are on and off ramps for Interstate 64 (I-64). The middle of the Project Area includes a mixture of community facilities and commercial, industrial, and residential properties (Figure 3). In the south end of the Project Area, there is access to more residential neighborhoods and the entire region's most dense collection of shops and restaurants, including "Southridge Center" and "The Shoppes at Trace Fork." An important future element in the Project Area is a proposed connector road ("RHL Boulevard Extension") between Jefferson Road and the Shoppes at Trace Fork, which houses not only big box stores but also a large sports complex with ice arena and soccer fields.

The flow of traffic along Jefferson Road is slowed by only having two lanes, by an active railroad crossing, and by an offset intersection, where two traffic lights provide access to Kanawha Turnpike (Kanawha County Route 12), another important connector road in the region (Figure 4).

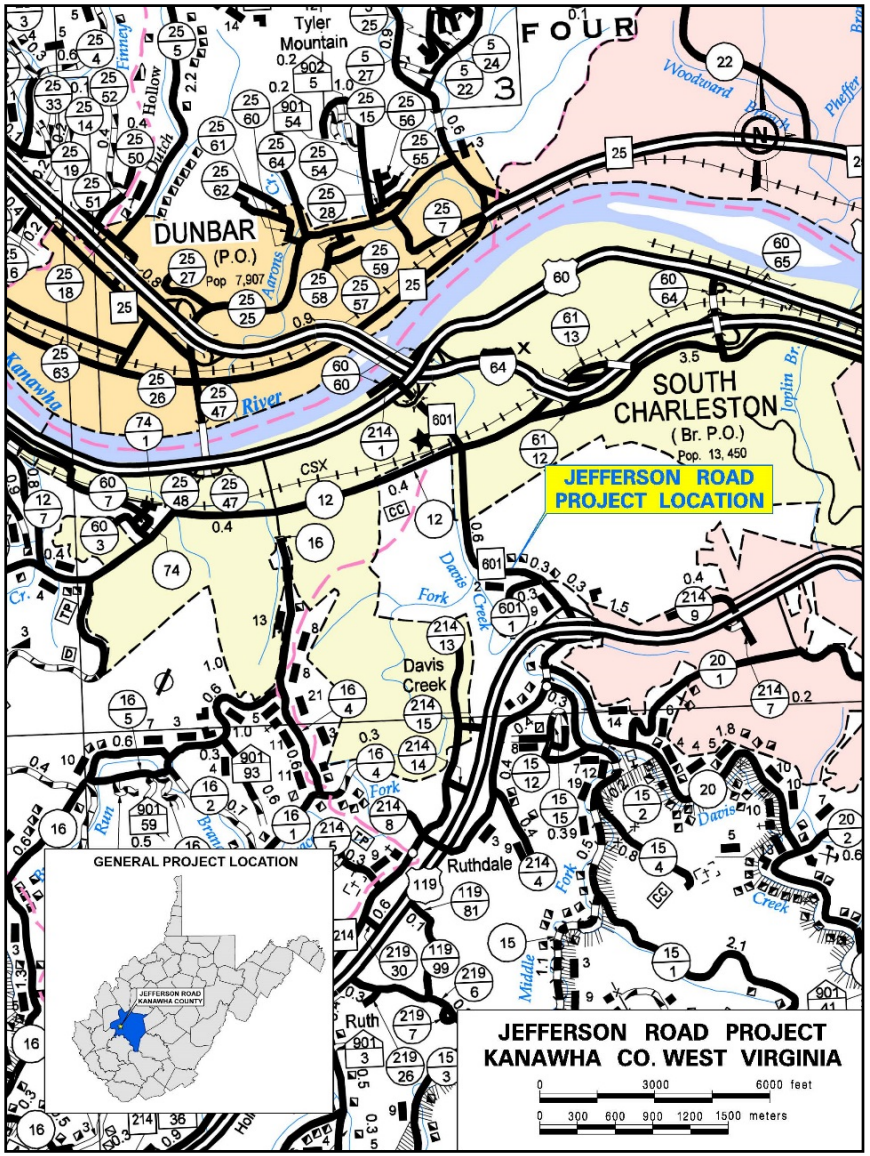


Figure 1. Highway Map Showing Project Area in Kanawha County, WV

The proposed project consists of widening Jefferson Road from two and three lanes to four and five lanes. The alignments of both build alternatives detailed in this analysis predominantly follow the roadway, but diverge south of Kanawha Turnpike, offering different options for eliminating the offset intersection.

What is the Project History?

Since the 1990's, regional planners have recommended the widening of Jefferson Road. In 1996, the Charleston Metropolitan Transportation Plan recommended the widening of Jefferson Road to a four-lane facility, as well as a grade separation of the railroad crossing (Barton-Aschman Associates, Inc., 1996). Planning for the project was undertaken by the WVDOH Program Planning & Administration Division, which produced a preliminary report in August of 2004, examining six (6) build alternatives.

WVDOH continued project development with a 2012 Design Study and a 2013 Planning Study (TRC, 2012 and 2013). These documents presented preliminary traffic studies and designs for five (5) and seven (7) build alternatives, respectively.

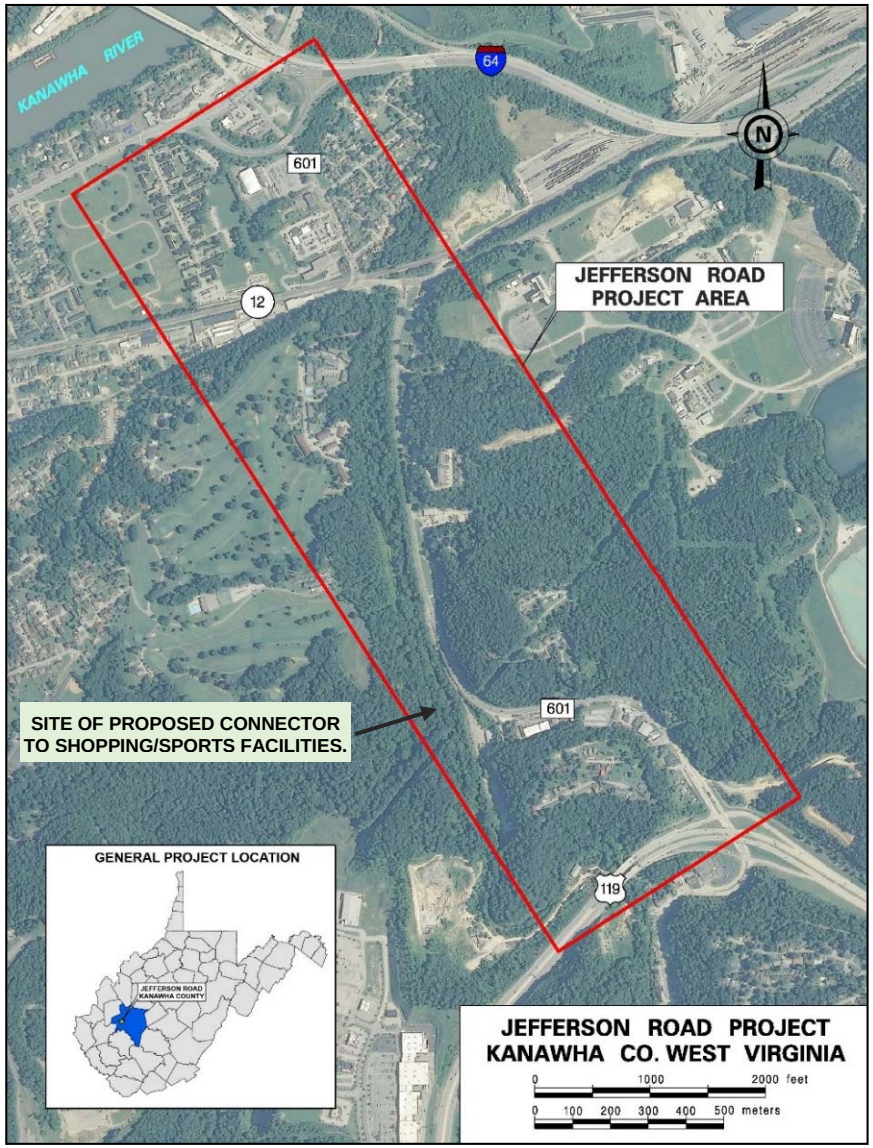


Figure 2. Aerial View of Project Area. See Figure 4 for close-up view of off-set intersection in the northern third of the project.

Figure 3. Various scenes in the Project Area. Clockwise from top left: Davis Creek, which parallels and crosses under Jefferson Rd; commercial area along Jefferson Rd in the southern Project Area; South Charleston Detachment of WV State Police, which lies along Jefferson Rd in the northern Project Area; and residences along Park St, which parallels Jefferson Rd in the northern Project Area.

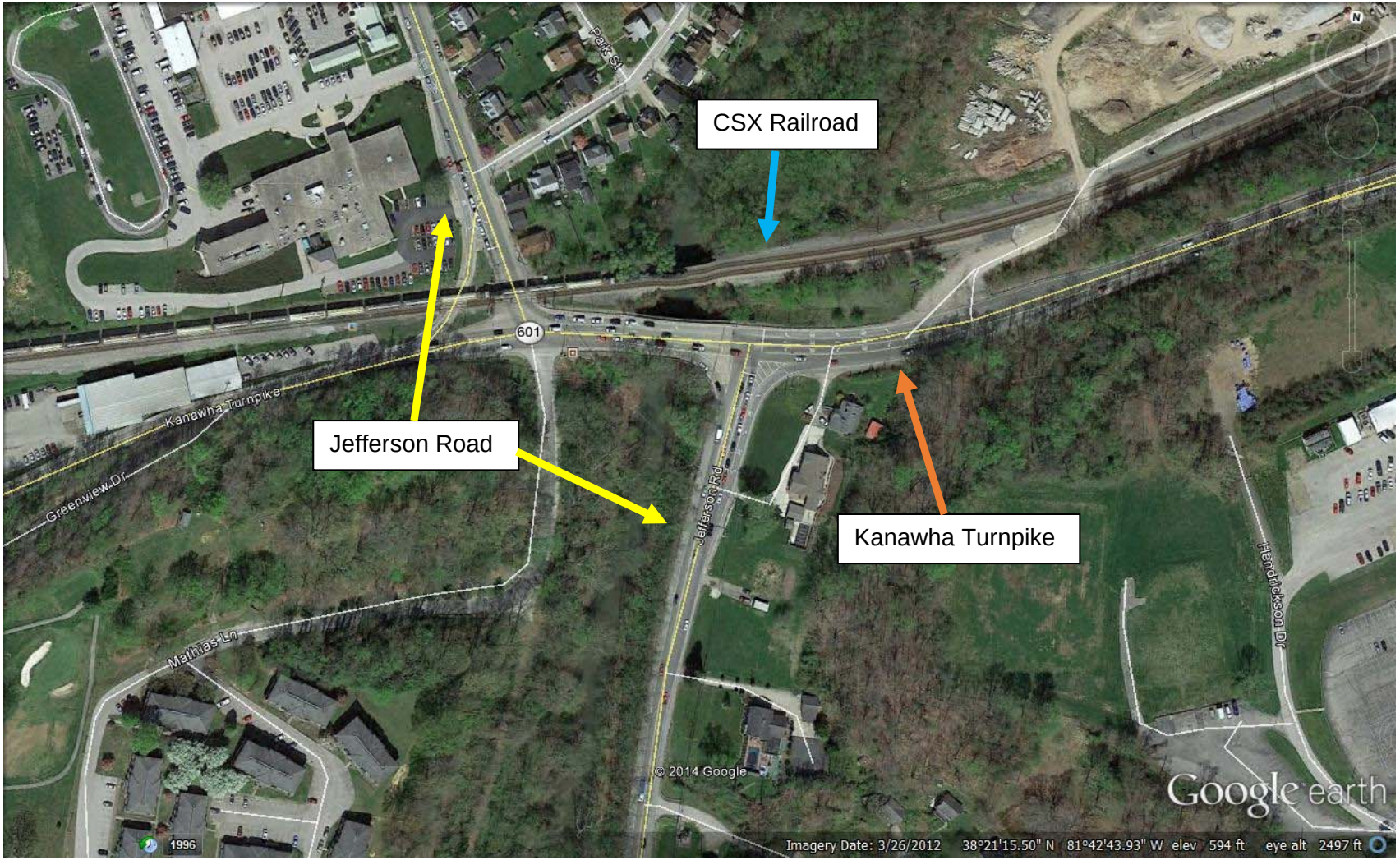


Figure 4. Aerial view of offset intersection of Jefferson Road with the Kanawha Turnpike and CSX railroad. This view also shows the edge of a golf course and apartment complex on the left and the edge of an industrial park on the right. *(Source: Google Earth, March 2012 image)*.

In 2013, WVDOH completed an initial phase of environmental analysis and agency and public outreach. WVDOH preliminarily examined seven (7) alternative alignments through the Project Area. WVDOH produced a Planning and Environmental Linkage (PEL) report, the development of which included meetings and interviews with stakeholders as well as a public information workshop held in March of 2013. The PEL provides a basic assessment of the build alternatives as well as the No Build Alternative. The preliminary alternative alignments are shown in Figure 5, and the PEL is included as Appendix A.

WVDOH received comments on the preliminary alternatives. In general, the project received supportive comments, and most specific comments fell into one of four categories:

1) Support for a grade-separated railroad crossing.
2) Support for bicyclist and pedestrian facilities.
3) Concern for impacts to Jefferson Place neighborhood (e.g., relocations, access, and quality of life).
4) Concern for flooding implications of the project.

Using information gathered during the PEL process as well as reviews in the field and additional engineering, WVDOH decided to carry forward Alternatives 1 and 5 for more detailed study. As detailed later in this document, these alternatives offer an option for a grade-separated railroad crossing and an option that minimizes relocations.

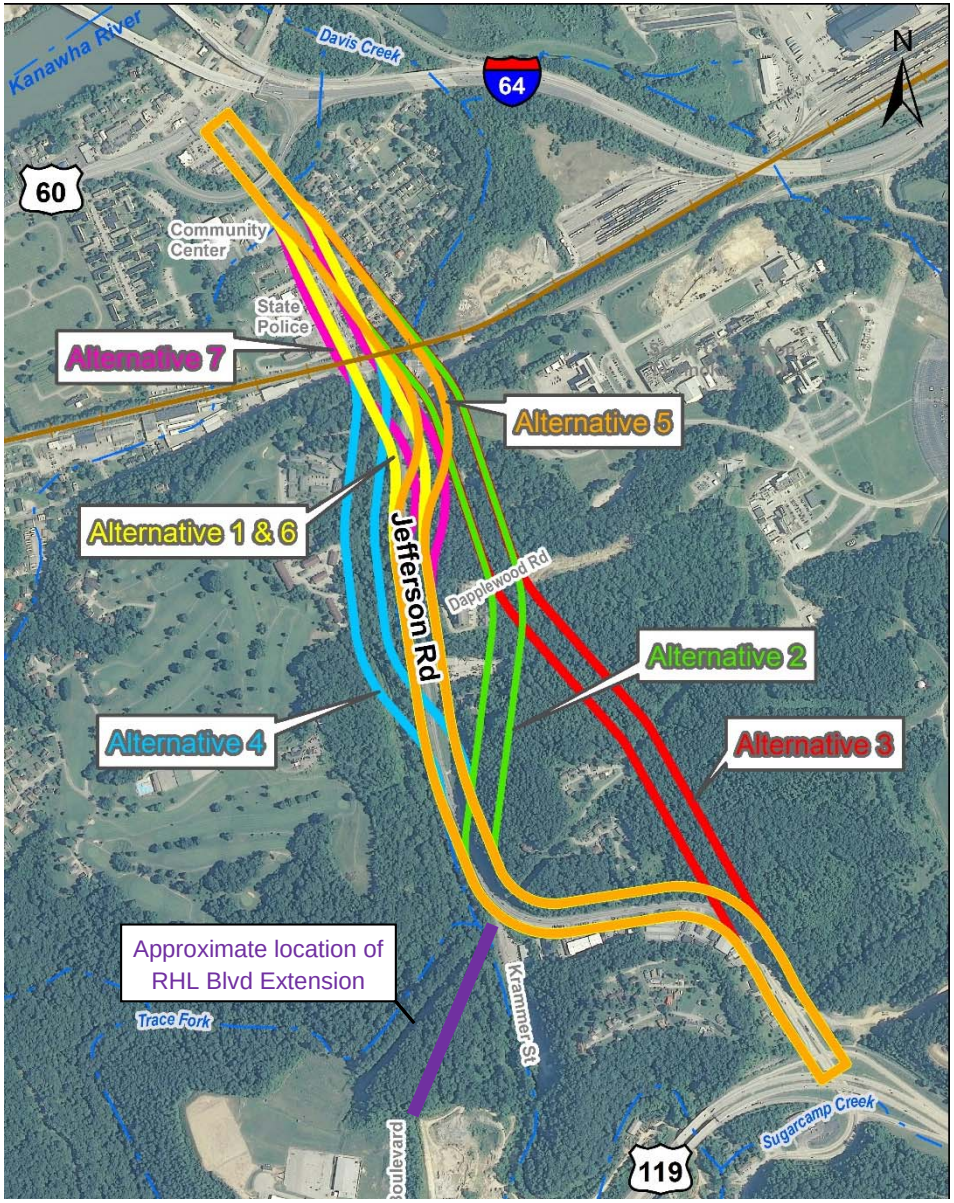


Figure 5. Preliminary (2013) Alternative Alignments through the Project Area.

The Regional Intergovernmental Council (RIC), which serves as the Metropolitan Planning Organization for the Charleston, WV area, has included this project as an "Existing + Committed" project in their current Long Range Plan (RIC, 2013). This project is also included as a "key transportation project" in the Kanawha County Comprehensive Plan (Kanawha County Commission, 2014).

This project was included with the RIC's 2012-2015 Transportation Improvement Program (TIP) and with the most recent Statewide Transportation Improvement Program (STIP) maintained by the WV Department of Transportation (WVDOT) (RIC, 2012; WVDOT, 2016).

What are the Needs for the Project?

As detailed in the following sections, Jefferson Road has the following needs in the Project Area:

- Congestion Relief
- Improved Safety
- Increased Opportunity for Economic Development

Congestion

Jefferson Road serves traffic in South Charleston as well as areas such as Dunbar, St. Albans, and regional through-traffic connecting between I-64 East and US 119 South. These travel demands have resulted in traffic volumes on Jefferson Road which exceed the capacity of a two-lane roadway.

Traffic study results (Stantec, 2015) indicate that excessive congestion is occurring, primarily in the PM peak hour, and by Year 2030 will overwhelm the capacity of the dual intersections of Jefferson Road and Kanawha Turnpike as currently aligned. For both signalized and unsignalized intersections, capacity and "level-of-service" (LOS) analyses were performed. LOS for intersections is a "grade" for the amount of control delay a vehicle experiences. Control delay is the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. The thresholds for LOS are shown in Table 1.

Table 1. Level-of-Service Thresholds

LOS	Control Delay (seconds/vehicle)	
	Signalized Intersections	**Unsignalized Intersections**
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Source: 2010 Highway Capacity Manual Note: Additional delay is considered acceptable at signalized vs. unsignalized intersections.

Results of the traffic study for various intersections in the Project Area are shown in Table 2. Complete results are provided in attachments to the detailed alternatives analysis in Appendix B.

Table 2. Traffic at Intersections - Existing and Future (2030) Without the Project

Location (all on Jefferson Road)	Existing (2014) LOS and Control Delay				Future (2030) LOS and Control Delay			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Northbound at MacCorkle	139.3	F	281.0	F	120.0	F	254.8	F
Bob Evans	15.8	C	19.8	C	17.7	C	36.5	**E**
McDonalds	15.5	C	20.4	C	16.7	C	34.5	**D**
Community Ctr (north access)	21.2	C	16.8	C	27.8	**D**	53.8	**F**
Community Ctr (south access)	15.0	B	12.5	B	33.1	**D**	18.1	**C**
Washington St	14.9	B	15.8	C	15.8	**C**	14.5	B
Pennsylvania Ave	12.3	B	13.1	B	12.7	B	18.8	**C**
Kanawha Tnpk /Mathias Ln	99.8	F	60.9	E	154.1	F	174.2	**F**
Kanawha Tnpk	109.1	F	55.1	E	102.6	F	169.0	**F**
Kramer St	23.2	C	94.4	F	43.2	**E**	132.9	F
Corridor G (southbound)	16.7	C	24.3	C	19.7	C	98.6	**F**
Oakhurst Dr	44.1	D	44.2	D	46.1	D	69.7	**E**

Source: Stantec, 2015 Notes: Red, bold letters indicate when the future control delay increases to an extent where the LOS category is worse (e.g., changes from D to E). Additional detail is available in the full traffic report (see Appendix B). Signal timings were adjusted for each analysis scenario.

As shown in Table 2, LOS is the same (e.g., C in existing condition and C in future condition) or worse (e.g., C in existing condition and E in future condition) at all the listed intersections in both the AM and PM peak hours of traffic, with the exception of one location in the PM peak hour alone (Washington Street) which shows only a 1.3 second improvement in the future. It should be noted that the LOS results are for "no train crossing" scenarios.

The traffic study also analyzed travel times through the Project Area and the lengths of lines, or queues, in the Project Area. Although the traffic study included examination of train delay scenarios, these summary results presume no train delay as a "best-case scenario" for examining the future without the proposed project. Key results include the following:

- Average AM peak travel time on Jefferson Road northbound through the corridor (one of the typical morning commute routes) is forecast to increase from 3.6 minutes (existing) to 7.9 minutes (Year 2030).
- Average PM peak travel time from westbound Kanawha Turnpike to southbound Jefferson Road through the corridor (one of the typical evening commute routes) is forecast to increase from 4.1 minutes (existing) to 10.1 minutes (Year 2030).
- The maximum AM peak queues of northbound traffic on Jefferson Road before the Kanawha Turnpike intersection is forecast to increase from 363 feet to 1,986 feet.
- The maximum PM peak queues of southbound traffic on Jefferson Road before the Kanawha Turnpike intersection (in front of the Police Station) is forecast to increase from 449 feet to 1,564 feet.
- If the proposed Jefferson Road improvements are not in place, planned construction of the RHL Boulevard Extension will create new spillback queues toward the Shoppes at Trace Fork in the west and toward Kanawha Turnpike in the north.

Safety

A safety analysis was conducted using crash data for the years 2013, 2014, and 2015. During the 3-year period, 273 crashes were reported along the 1.75 mile corridor. The Annual Average Daily Traffic (AADT) during this time frame for this section of roadway was 21,800. Thus, the crash rate was calculated to be 6.54 crashes per million vehicle-miles traveled (VMT), which is four times the statewide average crash rate for similar facilities (1.63 crashes/ million VMT in 2013). There were no reported fatalities during this time period.

A crash cluster map (Figure 6) was developed to determine high crash locations. Because the project is addressing traffic approaching Jefferson Road as well as along it, crashes on those connecting roads at the intersections with Jefferson Road were also examined. As shown on the map, higher numbers of crashes tend to occur at intersections, which is typical for this type of roadway. Jefferson Road at the Kanawha Turnpike intersection and to the north tended to have more crashes than the southern portion of the study area. In particular, the Jefferson Road intersections with MacCorkle Avenue (US 60) and Kanawha Turnpike

Figure 6. Crash Data for the Project Area.

experienced the highest number of crashes during the 3-year analysis period. This is expected given the traffic volumes of these intersections and the congestion in those areas.

The road and light conditions and crash types were examined for the 333 crashes represented in (Figure 6). Most (261 or 78%) occurred with dry conditions, and most (278 or 83%) occurred in daylight. While some of the crashes were instigated by issues unrelated to traffic, such as a falling object or animal crossing, the vast majority (308 or 92%) were due to motor vehicle movements. Most of the crashes were rear end or right angle collisions (232 out of 333, or 70%). As compared to other types of collisions, such as sideswipes, these collision types more likely relate to stop-and-go traffic conditions and the number of access points and intersections. A detailed breakdown of crash types is provided in Appendix B.

Emergency response time is another safety concern. With queuing traffic, few travel lanes, and little shoulder, emergency vehicles can be stuck in traffic. Police vehicles exiting the facility on Jefferson Road can also be blocked (Figure 7).

Figure 7. Two views, facing south, of Jefferson Road adjacent to the WV State Police Headquarters, South Charleston Detachment. Left: markings in the road to help prevent traffic from blocking access to the facility. Right: Southbound queueing traffic from the Kanawha Turnpike intersection, blocking the access.

Economic Development

The West Virginia Regional Technology Park is experiencing growth, including the expansion of BridgeValley Community and Technical College. For example, a 55,000 sq ft Advanced Technology Center, shown in Figure 8 was opened in 2014.

The 260-acre Park can bring substantial additional economic development to South Charleston, but access is constrained by the severe congestion on Jefferson Road. Local officials also believe that commercial development along Jefferson Road itself and in the commercial area along US 119 is being hindered by the congestion on Jefferson Road.

Figure 8. New (2014) Advanced Technology Center within the WV Regional Technology Park, just east of the Project Area.

What is the Purpose of the Project?

Based on the needs discussed in the previous section, WVDOH has developed the following project purpose statement:

> *The purpose of the Jefferson Road Improvement Project is to relieve congestion, improve safety, and improve opportunity for economic development in South Charleston, WV.*

What are the Alternatives Under Consideration?

Preliminary Alternatives Screening

As mentioned above, seven (7) preliminary alternatives (Figure 5) were reviewed in a PEL study and were presented in a March 2013 public workshop (Appendix A). Since that time, WVDOH has considered results of the PEL study and comments received on the preliminary alternatives. A complete detailed alternatives analysis is presented in Appendix B, but a summary is provided below.

Comments received following the March 2013 public workshop included general comments of support for the project, comments regarding the design of the facility, and comments concerning potential environmental impacts. Most comments fell into one of four categories, which are listed below along with a summary of how the concern was addressed in the alternatives analysis.

1) Support for a grade-separated railroad crossing.

The grade separation for the railroad crossing was considered an important element to include in one of the alternatives carried forward for detailed analysis.

2) Support for bicyclist and pedestrian facilities.

Any alternative carried forward would include improvements to bicyclist and pedestrian facilities.

3) Concern for impacts to Jefferson Place neighborhood (e.g., relocations, access, and quality of life).

The alternatives carried forward do not bisect the Jefferson Place neighborhood, and minimize relocations to the extent practicable while incorporating other important project elements.

4) Concern for flooding implications of the project.

Any alternative carried forward would undergo a hydraulic analysis for preliminary assessment and the Selected Alternative would undergo detailed analysis yielding mitigation measures for preventing additional flooding problems.

The preliminary alternatives were screened to eliminate the impractical alternatives and to reduce the number of alternatives requiring more detailed engineering and environmental study. The screening eliminated one alternative because it would require 10's of millions of more dollars for relocating the new state police facility along the Jefferson Road. The screening also eliminated the two alternatives that would have the largest overall environmental impact. Finally, the screening examined three alternatives that were very similar, and eliminated the two that would have more environmental impacts.[1] This screening is detailed further in Appendix B, and a summary of the results is provided below:

[1] It should be noted that the preliminary number of relocations was not one of the final screening criteria. With the exception of Alternative 1 Option A (which did not include a bridge over the railroad crossing), all of the Build Alternatives would preliminarily determined to require 27 to 33 residential relocations. These differences were not considered substantial enough for basing an alternatives screening, especially because refined design could increase or lower these numbers.

- Preliminary Alternative 7 was eliminated because it directly impacted the new WV State Police Headquarters facility along Jefferson Road in the northern Project Area. Replacing that facility would cost tens of millions of dollars.
- Preliminary Alternatives 2 and 3 were eliminated because they were the longest and would disturb the most area. These alternatives also required the most excavation.
- Preliminary Alternative 4 was eliminated because it cost more and had higher impacts than another alternative that offered a similar alignment (Preliminary Alternative 1). It required more excavation, had a higher potential to impact a cemetery and a public recreational facility (the Little Creek Golf course), and had higher construction as well as right-of-way costs.
- Preliminary Alternative 6 was eliminated because it offered little additional benefit as compared to Preliminary Alternative 1, but did not include the option of phasing construction like Preliminary Alternative 1 provided.

Alternatives Carried Forward

Preliminary Alternatives 1 and 5 have been carried forward for more detailed engineering and environmental analysis. Since 2013, these alternatives have been refined, and are more simply called Alternative 1 and Alternative 5. WVDOH conducted field reviews with resource agencies in the spring of 2015. Additional refinements were incorporated in response to field review comments, and the traffic analysis was revised in the summer of 2015.

The 2015 traffic analysis revealed that the future condition with either alternative improves but still has substantial delays (control delays of half a minute) at the Kanawha Turnpike-Jefferson Road intersection. WVDOH proceeded to investigate the option of inputting a roundabout at that location to keep traffic moving. In the fall of 2015, WVDOH added a roundabout option to the design of Alternative 5. A roundabout would not fit in the location of that intersection with Alternative 1. Although the roundabout is considered an “option” at this time, this EA includes the roundabout in order to present the largest alignment footprint and its associated impacts.

The following paragraphs detail each of the alternatives carried forward. Each Build Alternative description references Davis Creek and the 100-year floodplain. These features are shown in Figure 9.

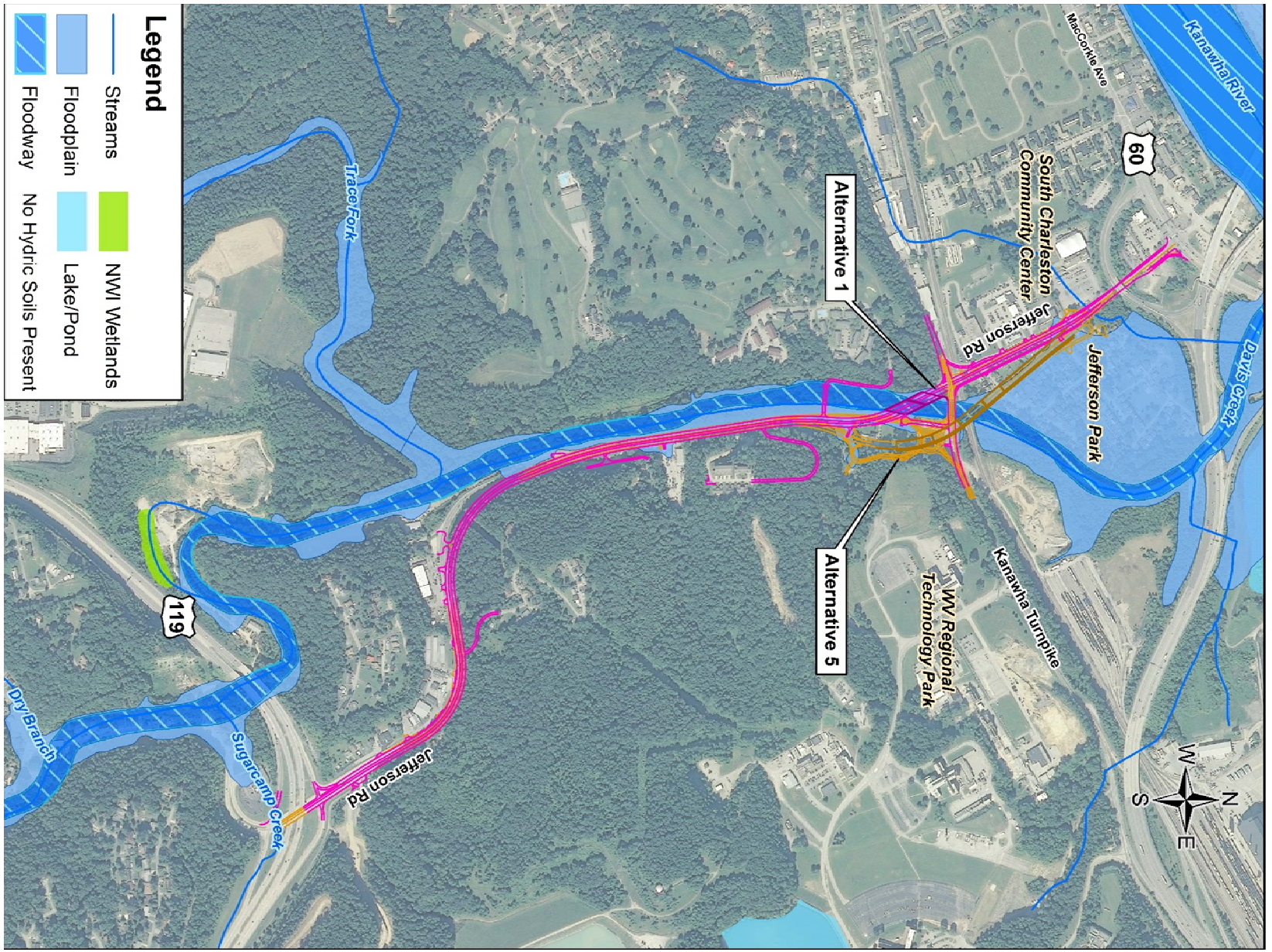


Figure 9. Study Area Streams and Floodplains.

No Build Alternative

Under the No-Build Alternative, the proposed project is not implemented. This alternative includes all currently adopted and planned transportation improvements in the Project Area. Jefferson Road undergoes routine maintenance, but is not substantially altered. Future travel demands are projected to increase with increased development to the south of Jefferson Road, and traffic modeling shows an increase in traffic congestion at intersections and increased travel times in the project area. Although the No-Build Alternative does not meet the project's purpose and need, it is carried forward for analysis as a basis of comparison for the Preferred Alternative.

Alternative 1

Preliminary Alternative 1, as presented in the 2013 PEL study (Appendix A), included "Option B" which added two flyover lanes to be constructed after the Kanawha Turnpike at-grade intersection was realigned. However, WVDOH has decided to carry forward Alternative 1 without the flyover lanes. Details on the flyover lanes are provided in Appendix B, "Alternatives Analysis." In short, the flyover lanes add walls alongside the at-grade portion of Jefferson Road through the northern project area. This blocks direct access to Jefferson Road from the WV State Police Headquarters, thus necessitating construction of a new access road. Also, carrying forward Alternative 1 without the flyovers provides detailed analysis of an alternative that does not include the added expense of bridging Kanawha Turnpike and the railroad.

The full alignment of Alternative 1 is shown in Figure 10 and cross sections of the design are shown in Figure 11. Alternative 1 has design speeds of 40 mph south of Kanawha Turnpike and 35 mph north of Kanawha Turnpike, and the width of the travel lanes is 11 feet. The alternative generally widens existing Jefferson Road from two to five lanes.

Alternative 1 generally follows the existing alignment of Jefferson Road from US 119 to approximately 600 feet south of Kanawha Turnpike. At this point the alignment deviates from existing Jefferson Road and crosses Davis Creek via a new bridge to intersect with Kanawha Turnpike. This new alignment lines up with the northern portion of Jefferson Road, forming a four-leg at-grade intersection. Jefferson Road, north of Kanawha Turnpike, again follows existing Jefferson Road to US 60. The existing at-grade railroad crossing remains and will be widened to accommodate the new travel lanes. Alternative 1 is approximately 1.6 miles long.

Proposed improvements include the addition of a dedicated right turn lane onto US 60. The widening of Jefferson Road, where the alignment follows the existing road, will be to the east of the existing travel lanes.

The new Jefferson Road bridge over Davis Creek is anticipated to be a two-span continuous structure with an overall length of 300 feet. One end of the bridge is curved, and it has a high degree of skew. The bridge will carry a six-lane typical section,

including a dedicated right turn lane at the intersection with Kanawha Turnpike. The bridge pier and abutments are in the 100-year floodplain.

Alternative 1 also includes relocation of access to Mathias Lane, from its current location along Kanawha Turnpike to Jefferson Road south of the Kanawha Turnpike. This relocation requires a new bridge and creation of new roadway along a ridge to meet existing Mathias Lane. This bridge will be a three-span continuous structure with an overall length of 190 feet. This structure also has abutments and piers in the 100-year floodplain.

Alternative 1 includes six-foot wide shoulders, within which five-foot bicycle lanes will be striped. Alternatively, a sidepath could be incorporated like that proposed with Alternative 5 (see below). Pedestrian access will remain largely unaffected by Alternative 1. The existing sidewalk on the east side of Jefferson Road from US 60 to a point across from the South Charleston Recreation Center will be removed, and any other sidewalks disturbed by the widening will be replaced. New crosswalks are currently proposed in front of the Community Center in the north and connected to the utility/recreation path in the south.

Overall, Alternative 1 involves acquiring 33.3 acres of residential property, requires the relocation of 26 residences and 1 office building, with the possibility of additional relocations to avoid damage from increased backwater (to be determined after final design and hydraulics analysis). More impacts are detailed in Table 6. Utility, right-of-way, and construction costs for Alternative 1 total $44,479,000.

Alternative 5

The full alignment of Alternative 5 is shown in Figure 12, and cross sections of the design are shown in Figure 13. As with Alternative 1, Alternative 5 has design speeds of 40 mph south of Kanawha Turnpike and 35 mph north of Kanawha Turnpike. This alternative also has a travel lane width of 11 feet and generally follows the existing alignment of Jefferson Road in the south of the Project Area. Approximately 1,400 feet south of Kanawha Turnpike, the alignment deviates from existing Jefferson Road to the east on a new alignment then back to the west, bridging over Kanawha Turnpike, the CSX Railroad, and Davis Creek to tie back into the existing road south of the I-64 overpass ramp. This design eliminates the at-grade railroad crossing. Alternative 5 is approximately 1.7 miles long.

Proposed improvements include the addition of a dedicated right turn lane onto US 60. The widening of Jefferson Road, where the alignment follows the existing road, will be to the east of the existing travel lanes.

Alternative 5 also includes a roundabout beneath the bridge to replace the offset intersection with Kanawha Turnpike. The roundabout will have four entrance and exit points, with traffic constantly flowing in a counterclockwise motion, not having to wait

for traffic signals. As currently designed, travelers heading west on Kanawha Turnpike will be able to continue in that direction without entering the roundabout. The same is true for travelers heading east on Kanawha Turnpike and wishing to turn right (southbound) onto Jefferson Road. Detail of the roundabout design is shown in Figure 14.

The new bridge is anticipated to be a four-span continuous structure with an overall length of 812 feet. One end of the bridge is on a curve. The bridge will carry a four-lane typical section and sidepath. The bridge piers and abutments are outside the 100-year floodplain, but the south approach embankment creates minor variations in the 100-year water surface, which will be studied in greater depth during final design.

North of the bridge, the roadway is on elevated retaining walls until tapering to meet ground level prior to a new signalized intersection in front of the South Charleston Community Center. This intersection provides access to the former Jefferson Road leading south to the WV State Police Headquarters and to the Jefferson Place neighborhood. Pennsylvania Avenue access to the Jefferson Place neighborhood will also be maintained under the new roadway.

The typical section includes a 10-foot sidepath to carry bicycles and pedestrians. A 5-foot buffer separates the sidepath from the road. The eastern sidewalk along Jefferson Road will be removed and the western sidewalk will remain (in front of the Police Station). New crosswalks are currently proposed in front of the Community Center in the north, where there will be a signalized intersection, and connected to the utility/recreation path in the south.

Overall, Alternative 5 involves acquiring 38.03 acres of residential property, requires the relocation of 35 residences and 1 office building. The predicted rise in backwater is anticipated to be minor and not requiring additional relocations. More impacts are detailed in Table 6. Utility, right-of-way, and construction costs for Alternative 5 total $56,214,000.

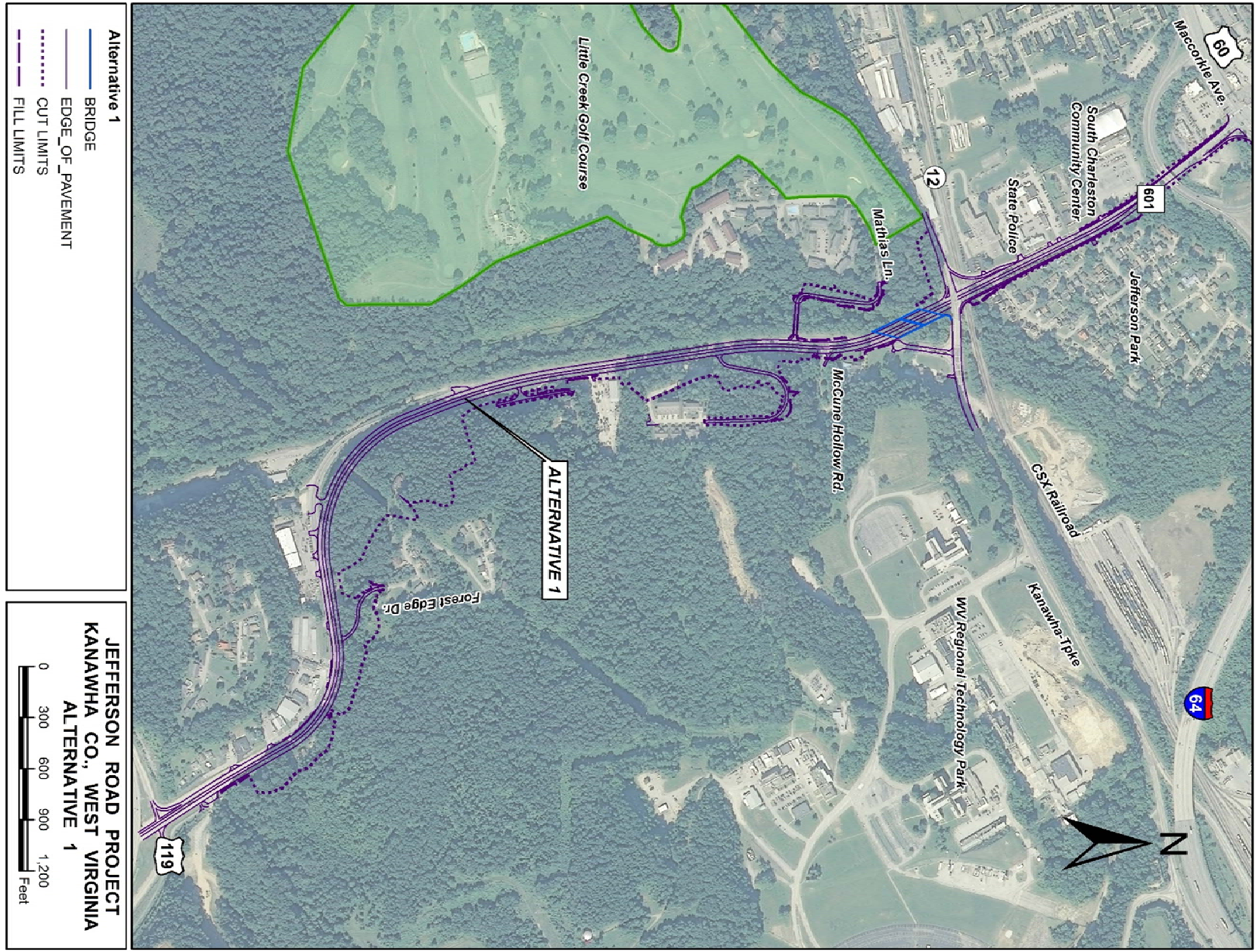


Figure 10. Alternative 1.

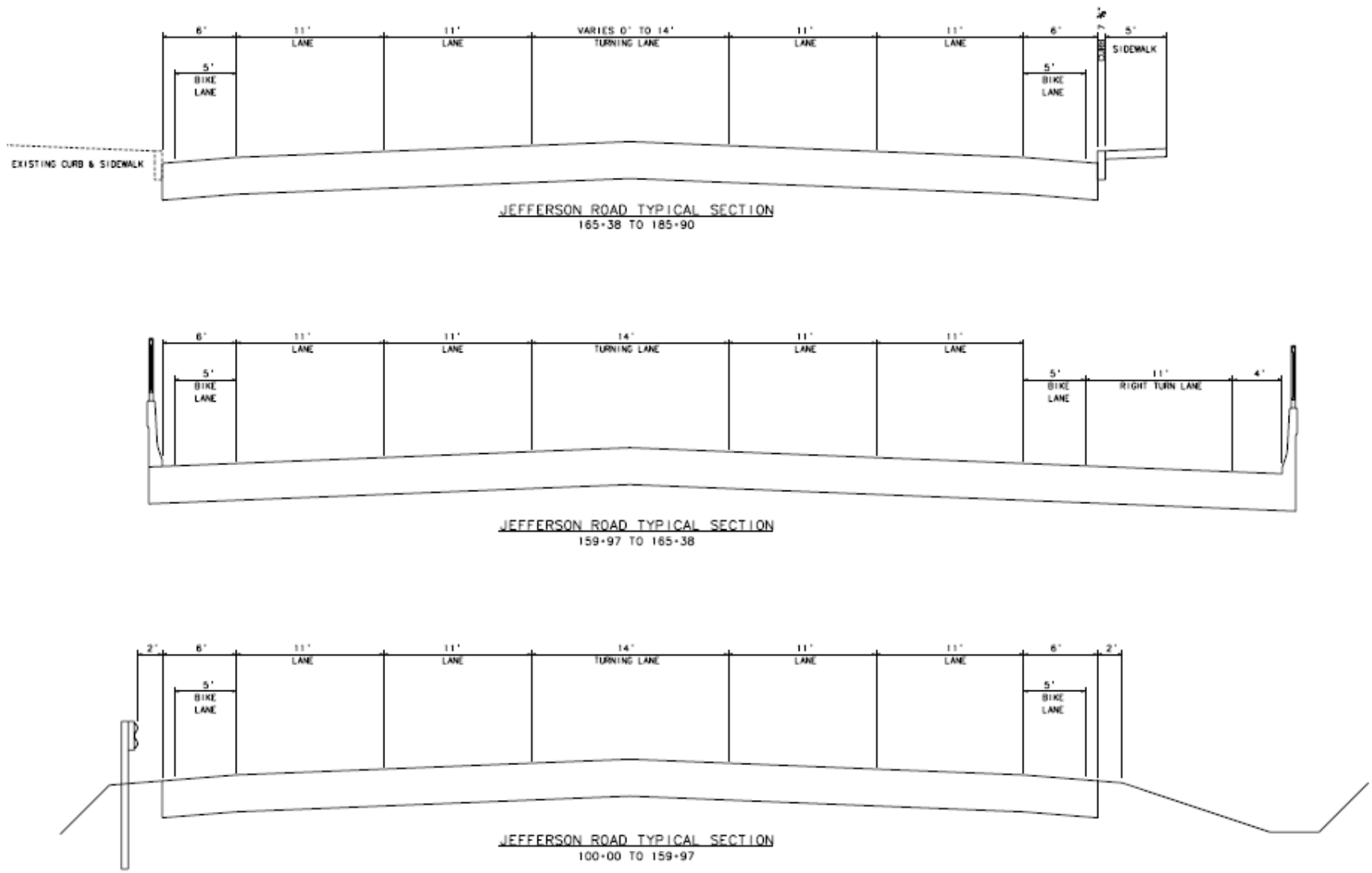
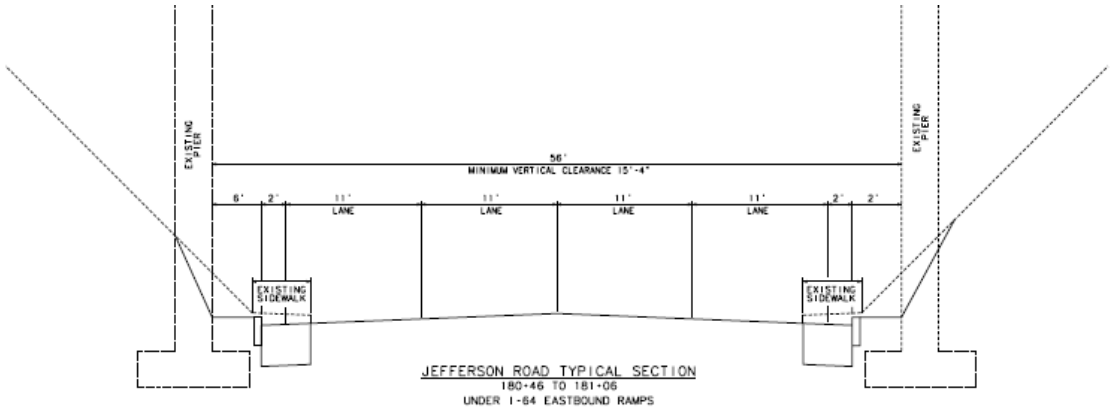
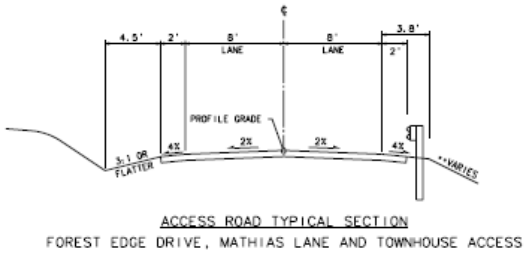


Figure 11. Typical Sections for Alternative 1 at different locations along the route through the Project Area.

NOTE: The wide shoulders lined for bicycles could be replaced with a sidepath and buffer as shown with Alternative 5 in next Figure.





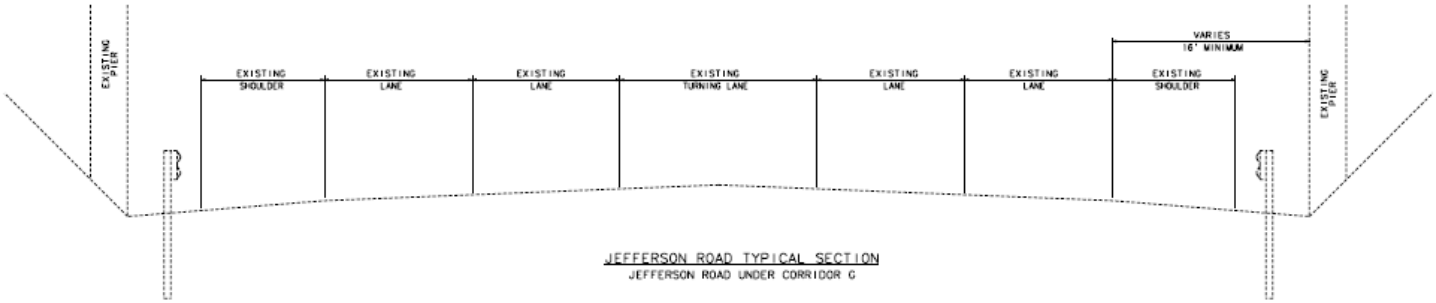


Figure 11 Continued.

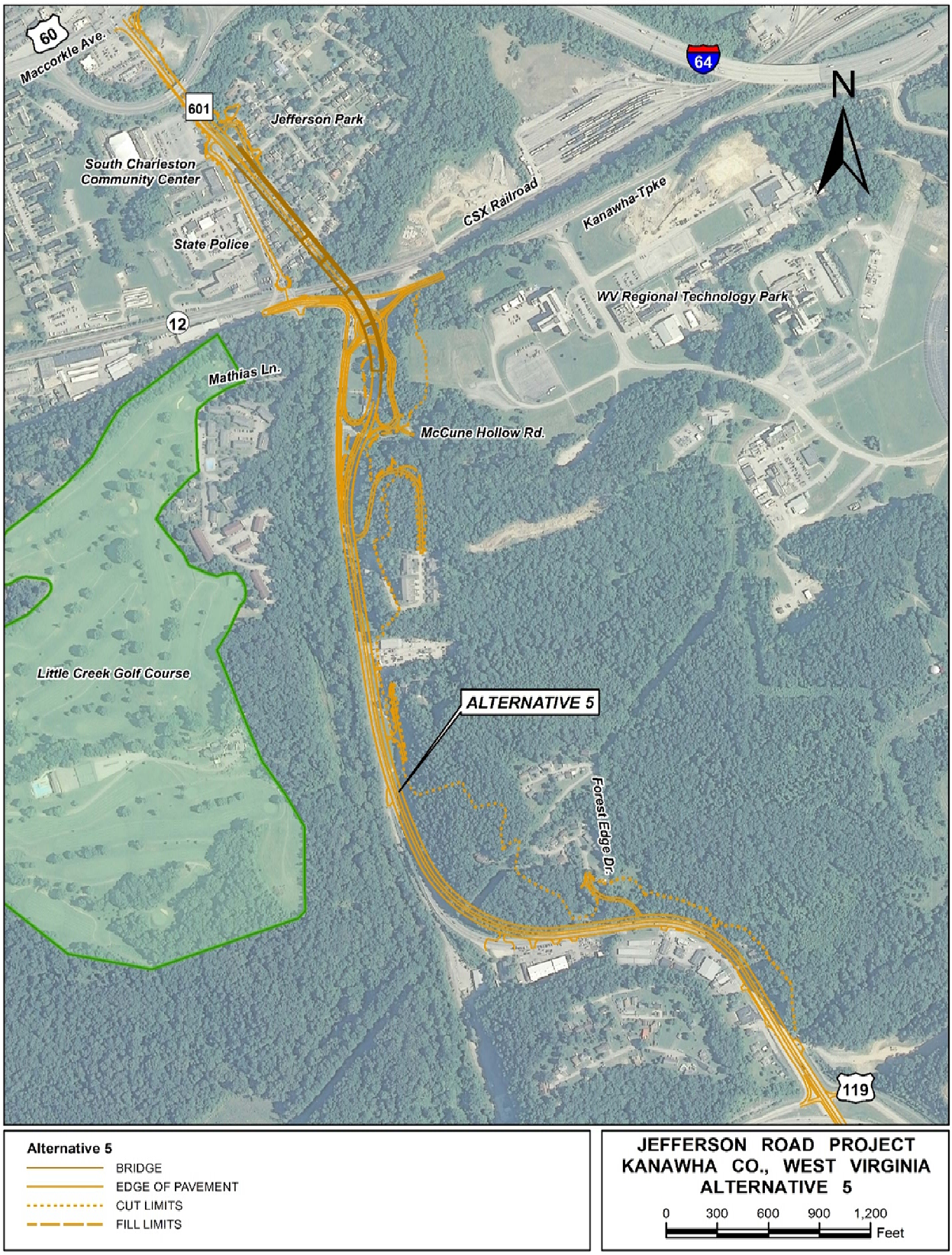


Figure 12. Alternative 5.

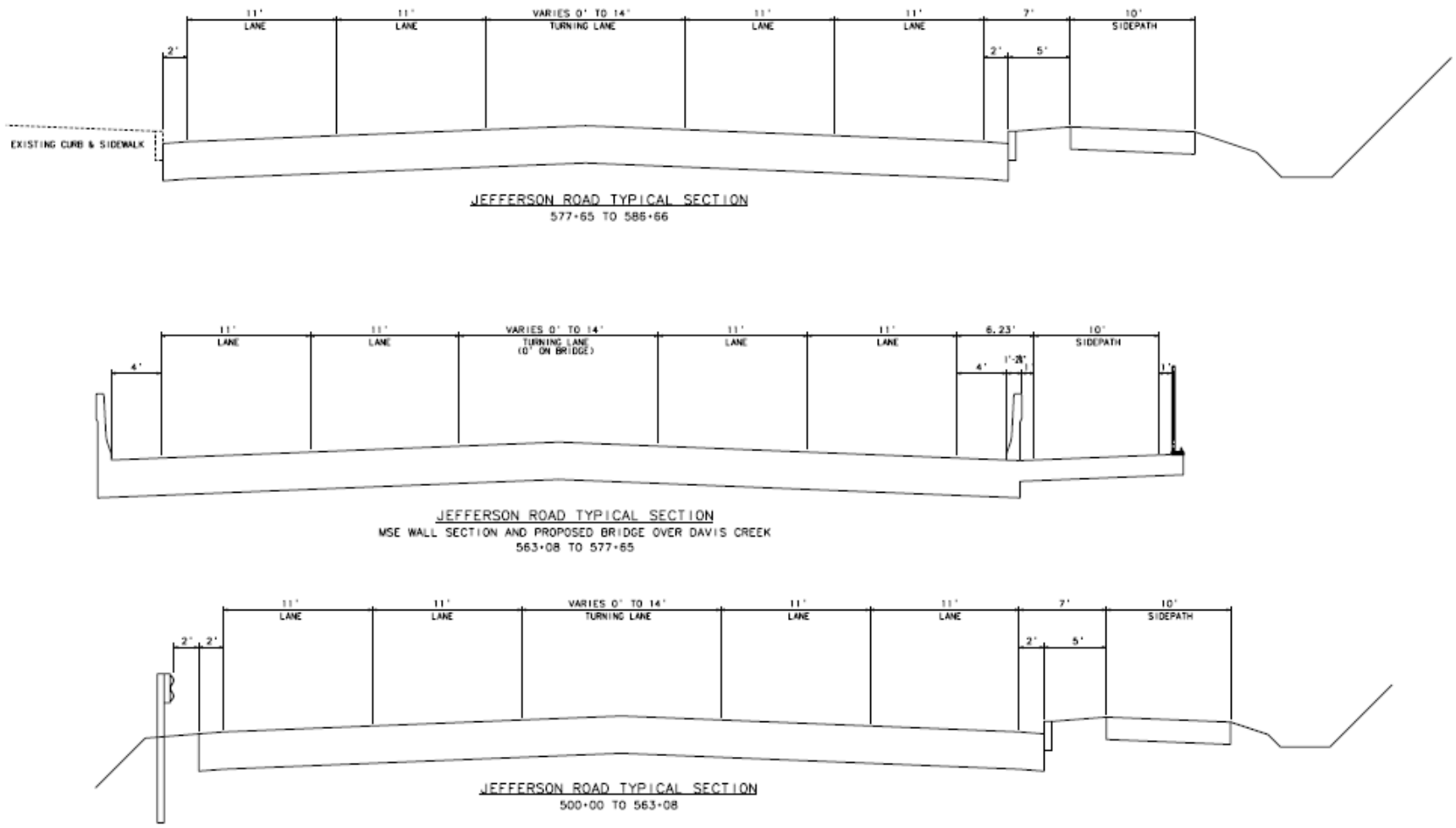


Figure 13. Typical Sections for Alternative 5 at different locations along the route through the Project Area.

NOTE: The sidepath with buffer shown in this typical section could be incorporated to Alternative 1 in lieu of wide shoulders lined for bicycles.

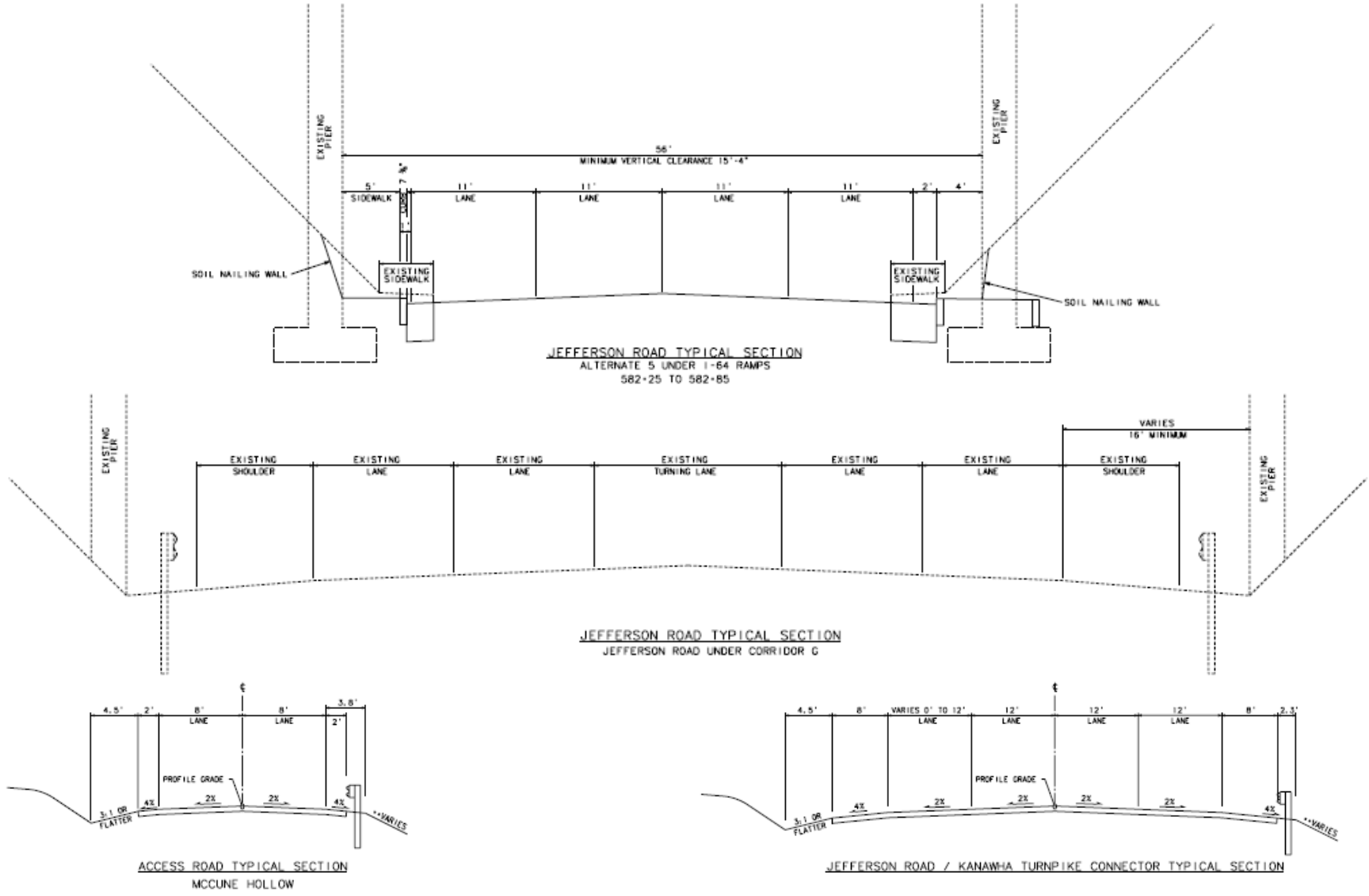


Figure 13 Continued.

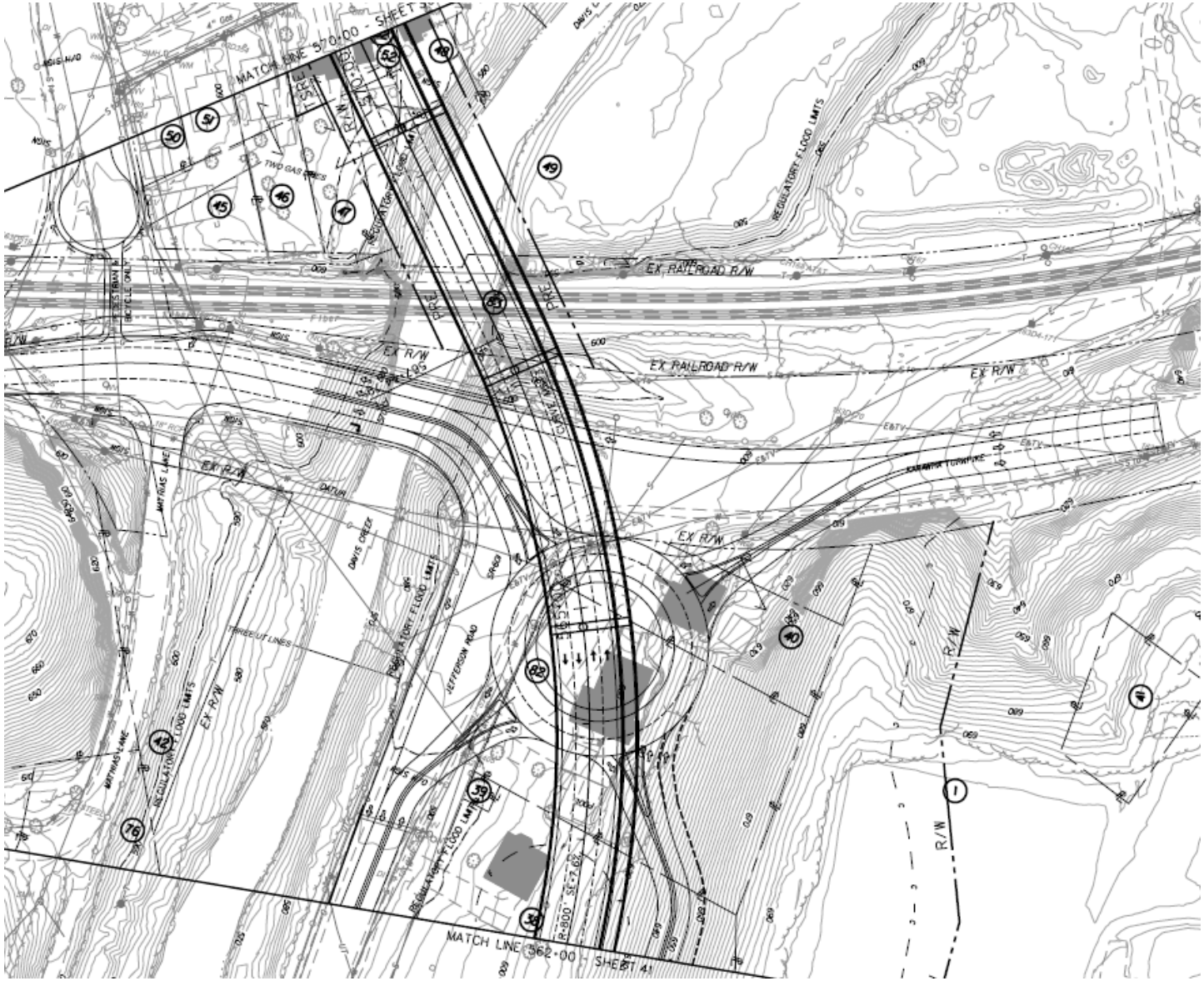


Figure 14. Preliminary plan for roundabout along Alternative 5 at intersection of Jefferson Road and Kanawha Turnpike.

How Well Do the Alternatives Meet the Purpose and Need?

The Build Alternatives were developed in order to meet the purpose and need for the project. The No Build Alternative will not meet the project needs, but it has been carried forward as a basis of comparison in this EA. Table 6 summarizes the elements of the project purpose and how they are addressed by the alternatives.

Table 3. Purpose and Need Summary for No Build vs. Build Alternatives

Project Purpose Element	No Build Alternative	Alternative 1	Preferred Alternative 5
Relieves Congestion	No	Yes. – Control delay times, LOS, travel times, and traffic queues all have overall improvement.	
Improves Safety	No	Yes – Improves the intersections with the most crashes (at MacCorkle and Kanawha Turnpike) with dedicated turning lanes and eliminating the offset intersection; reduces the incidence of stop-and-go traffic; and adds pedestrian/bicycle facilities.	
Improves Access to Economic Activity	No	Yes – Improves flow of traffic and adds turning lanes.	

Specifically with respect to congestion relief, results of traffic studies provide means for more detailed examination of how well each alternative addresses the project purpose. To help understand traffic with the proposed roundabout in Alternative 5, WVDOH conducted an additional traffic study (WVDOH, 2015) specifically for that location. Detailed results are included with Appendix B. Summarizing data from both traffic studies, Table 4 compares the control delay times and LOS results for the future condition (2030).

Either build alternative improves LOS at the Project Area intersections. Simplification of the Jefferson Road/Kanawha Turnpike intersection under Alternative 1 produces lower, acceptable delays when compared to the No Build Alternative. Under Alternative 5, these delays are significantly lower than those with the No Build Alternative or Alternative 1, as this intersection will handle much less traffic because the new bridge will be carrying through traffic and traffic along Kanawha Turnpike can continually move through the roundabout.

Table 4. Future (2030) Traffic at Intersections with Different Alternatives

Location	No Build Alternative LOS and Control Delay		Alternative 1 LOS and Control Delay		Preferred Alternative 5 LOS and Control Delay	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Northbound at MacCorkle	F 120 seconds	F 255 seconds	E 62 seconds	D 49 seconds	E 63 seconds	D 50 seconds
Bob Evans	C 18 seconds	E 37 seconds	C 18 seconds	C 19 seconds	C 18 seconds	E 35 seconds
McDonalds	C 17 seconds	D 35 seconds	C 18 seconds	C 19 seconds	C 18 seconds	C 22 seconds
Community Ctr (north access)	D 28 seconds	F 54 seconds	C 24 seconds	C 18 seconds	B 11 seconds	B 12 seconds
Community Ctr (south access)*	D 33 seconds	C 18 seconds	B 15 seconds	B 13 seconds	N/A	N/A
Washington St/ Park St*	C 16 seconds	B 15 seconds	B 11 seconds	B 12 seconds	A 5 seconds	A 9 seconds
Pennsylvania Ave	B 13 seconds	C 19 seconds	B 11 seconds	B 15 seconds	B 13 seconds	C 15 seconds
Kanawha Tnpk/ Mathias Ln**	F 154 seconds	F 174 seconds	C 33 seconds	D 43 seconds	B 11 seconds	B 13 seconds
Kramer St	E 43 seconds	F 133 seconds	C 25 seconds	F 52 seconds	B 11 seconds	B 13 seconds
RHL Blvd (Proposed)			A 7 seconds	B 18 seconds	A 7 seconds	B 16 seconds
Corridor G (southbound)***	C 20 seconds	F 99 seconds	C 15 seconds	C 25 seconds	C 16 seconds	D 28 seconds
Oakhurst Dr	D 46 seconds	E 70 seconds	D 39 seconds	D 35 seconds	D 44 seconds	D 44 seconds

Notes: Signal timings were adjusted for each analysis scenario. The model includes the assumption that the RHL Boulevard Extension and a new signalized intersection with Jefferson Road are constructed by 2030.

**For Alternative 5, the area near the south entrance to the Community Center changes – the Washington Street access is moved and becomes a new access to Park St, which has a signalized intersection with the end of the old Jefferson Road.*

*** For the Kanawha Turnpike intersection, Alternative 1 results come from the August 2015 Stantec study and Alternative 5 results come from a separate, preliminary roundabout traffic study produced by WVDOH in December 2015.*

**** The PM Peak Hour values for the Corridor G intersection do not match those in the 2015 Stantec report (Attachment 1), but were corrected by Stantec via email to WVDOH in April 2016.*

Sources: Stantec, 2015; WVDOH, 2015

With respect to travel time and queue length, the Stantec traffic study also revealed differences. More data are provided in the detailed Alternatives Analysis (Appendix B), but specific results include the following. Note: these results do not include the Alternative 5 roundabout, do not include delays for trains, and presume the RHL Boulevard Extension is constructed.

Travel Times: Compared with the No Build Alternative, peak period travel times in the Jefferson Road corridor were lower for Alternative 1 and lowest for Alternative 5. This is due to the simplification of the Jefferson Road/Kanawha Turnpike offset intersection in Alternative 1 or elimination of this intersection in Alternative 5. Specific results and differences include:

- Future average AM peak travel time on Jefferson Road northbound through the corridor (a typical morning commute route) is forecast to be 3.3 minutes with Alternative 1 and 2.6 minutes with Alternative 5.
- Future average PM peak travel time from westbound Kanawha Turnpike to southbound Jefferson Road through the corridor (a typical evening commute route) is forecast to be 3.8 minutes with Alternative 1 and 2.5 minutes with Alternative 5.

Traffic Queues: Most of the queuing problems that currently exist will be reduced or eliminated with either Alternative 1 or Alternative 5. Specific results and differences include:

- The maximum AM peak queues of northbound traffic on Jefferson Road before the Kanawha Turnpike intersection is forecast to be 298 feet with Alternative 1. This queue is eliminated with Alternative 5.
- The maximum PM peak queues of southbound traffic on Jefferson Road before the Kanawha Turnpike intersection (in front of the Police Station) is forecast to be 308 feet with Alternative 1. This queue is eliminated with Alternative 5.
- The maximum peak queues at the intersection with the proposed RHL Boulevard Extension are forecast to be 98 feet in the AM and 487 feet in the PM with Alternative 1 and 101 feet in the AM and 207 feet in the PM with Alternative 5.
- Under Alternative 5, delay and queuing at Jefferson Road/MacCorkle Avenue are worse than under Alternative 1 (though still acceptable) because the intersection at Kanawha Turnpike along Jefferson Road acts like a gate that allows a more limited amount of traffic to pass at one time.

What is the Preferred Alternative and Why?

Although both Alternative1 and Alternative 5 offer solutions to the project needs, Alternative 5 is expected to fulfill them to a greater extent than Alternative 1. Specifically:

- Delays at the most congested intersection in the Project Area (Jefferson Road/Kanawha Turnpike) will be reduced significantly more with Preferred Alternative 5 than with Alternative 1.
- Overall, peak period (AM and PM rush hours) travel times in the Jefferson Road corridor will be lower with Preferred Alternative 5 than with Alternative 1.
- During the planning study for the project, local officials and public comment letters stressed the importance they placed on having a bridge over the Kanawha Turnpike and railroad (see comment letters contained in the appendices of the PEL, Appendix A).

What are the Impacts Associated with the Alternatives?

Table 5 provides a summary comparison of impacts by each of the three alternatives carried forward in this EA: the No-Build Alternative, Alternative 1, and Alternative 5.

Table 6 provides a more detailed presentation of the existing environment and impacts. In this table, direct and indirect effects are described as applicable.[2] This table cross-references several more detailed reports included as appendices with this document, including: Environmental Justice Analysis, Air Quality Report, Noise Impact Analysis, and Hazardous Materials Screening. Where mitigation for impacts is needed, the table cross-references the appropriate Mitigation Item, detailed Table 7.

[2] As defined in the Code of Federal Regulations (CFR), direct effects are caused by the action and occur at the same time and place, and indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. 40 CFR § 1508.8

Table 5. Summary of Impacts

	No Build Alternative	Alternative 1	Alternative 5 (Preferred)
Length (miles)	1.7	1.6	1.7
Eliminates Offset Intersection	No	Yes	Yes
Includes Bridge Over Kanawha Trpk and RR	No	No	Yes
Davis Creek Crossings	No Impact	2	1
Total Area Required	None	67.7 acres	71.4 acres
Total Area of Forest	None	35.5 acres	31.5 acres
Residential Relocations	None	26	35
Commercial Relocations	None	1 small office/retail space building	1 small office/retail space building
2030 Design Year Noise Impacts	22	2	3
Cultural Resources	No Impact	No Impact	No Impact
Floodplains		Encroaches on 100-year flow; requires coordination with FEMA. Backwater increases > 0.1”	Backwater increases < 0.1”
Viewshed	No Impact	Little Impact	Substantial impact to portions of Jefferson Place neighborhood
Hazardous Sites and Utilities Issues	Not Applicable	Yes; replacement of main sewer pump	Yes
Estimated Cost*	None	$44.479 million	$56.214 million

** Estimate includes costs of construction, utilities, and right-of-way.*

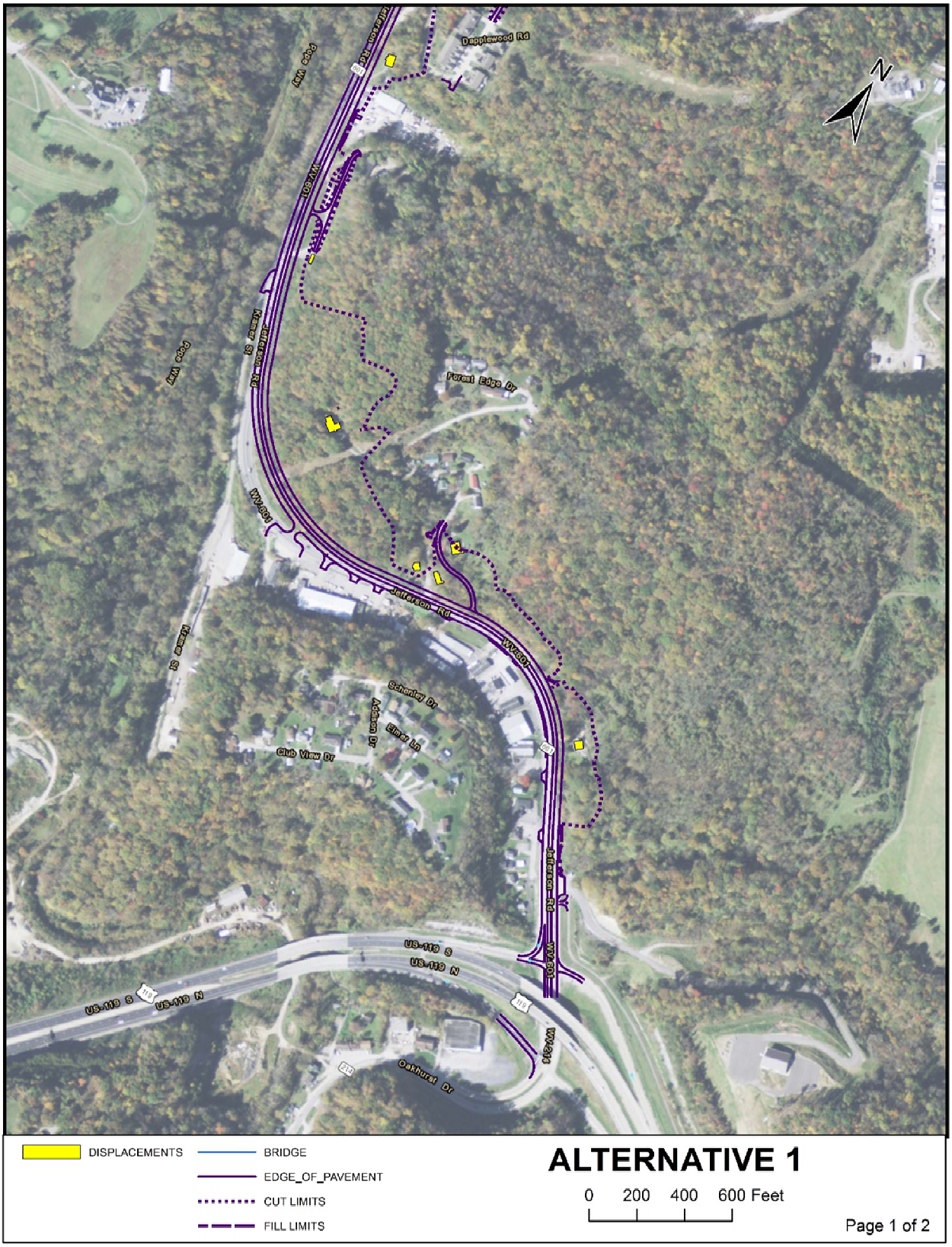


Figure 15. Relocations with the preliminary design of Alternative 1.

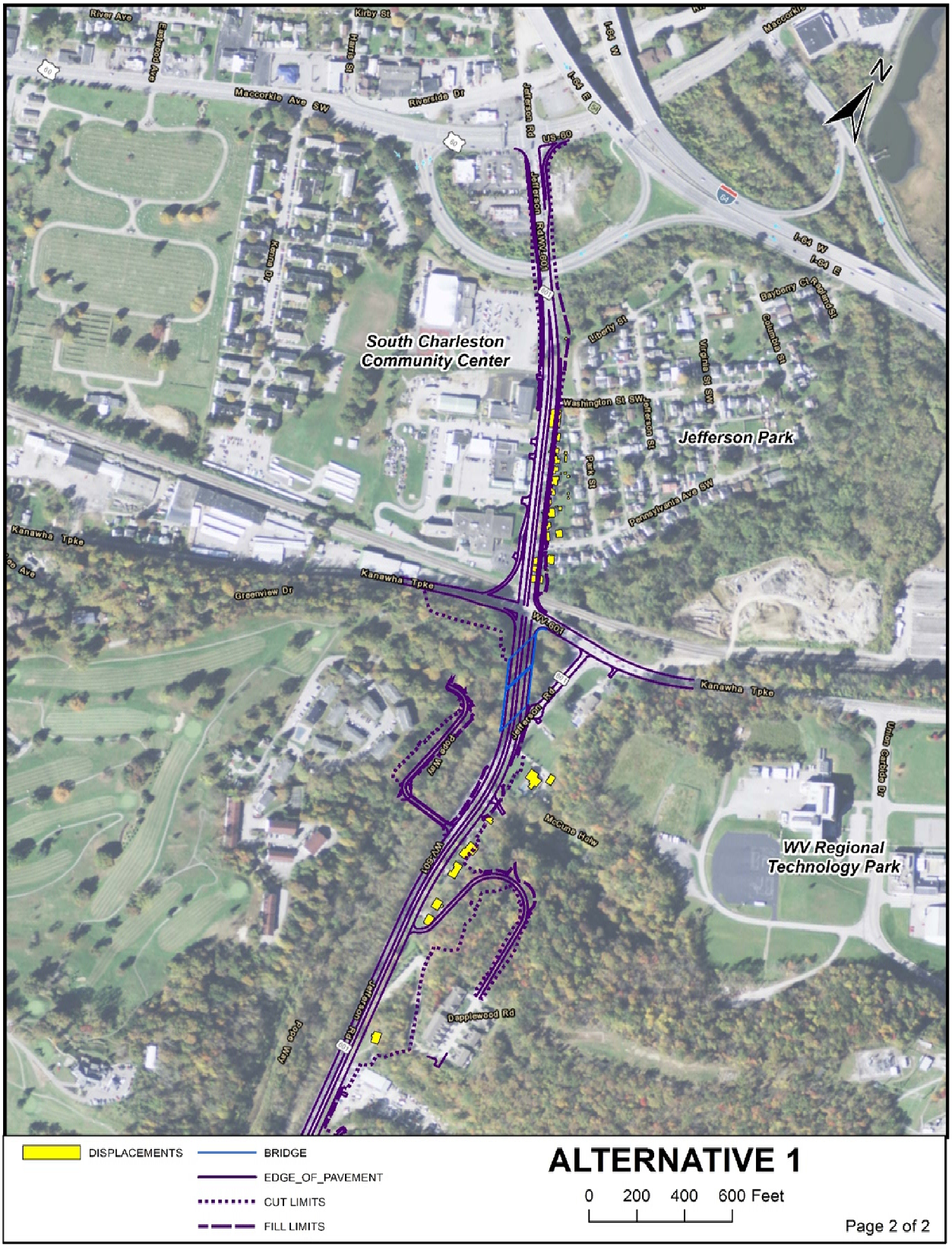


Figure 15 continued.

Figure 16. Relocations with the preliminary design of Alternative 5.

Figure 16 continued.

Table 6. Existing Environment and Detailed Environmental Consequences

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Construction Cost	Estimates include the costs of construction, utilities and right-of-way.	No direct costs other than routine maintenance.	$44,479,000	$56,214,000
Land Use	The project area is dominated by developed land, with residential, commercial, industrial, and transportation uses. Undeveloped and forested land exists along steep hillsides along Jefferson Road in the southern half of the project and in the riparian zone of Davis Creek. Data were collected from the NLCD and field observations during the PEL study. Indirect development with any of the alternatives would be in accordance with the City of South Charleston's zoning. A map of zoning classifications in the project area can be found in the PEL (Appendix A, Exhibit 4-2).	No changes.	The total area within the right-of-way limits is 67.7 acres, including 7.5 acres of existing roadway, and including 1.3 acres of area that crosses Davis Creek. The following lands will be converted to transportation use: • 8.7 acres commercial land use • 0.9 acre industrial land use • 13.6 acres residential land use • 35.5 acres forest • 0.1 acre undeveloped Because of the geographic constraints adjacent to Jefferson Road, no indirect development is anticipated within the Project Area other than continued development in the WV Regional Technology Park (visible in Figure 9). Indirect development is unlikely adjacent to the widened roadway, but could occur in the Technology Park and along US 119, areas zoned as industrial and commercial.	The total area within the right-of-way limits is 71.4 acres, including 7.3 acres of existing roadway, and including 0.8 acre of area that crosses Davis Creek. The following lands will be converted to transportation use: • 12.8 acres commercial land use • 1.1 acres industrial land use • 17.9 acres residential land use • 31.5 acres forest • 0.1 acre undeveloped Because of the geographic constraints adjacent to Jefferson Road, no indirect development is anticipated within the Project Area other than continued development in the WV Regional Technology Park (visible in Figure 9). Indirect development is unlikely adjacent to the widened roadway, but could occur in the Technology Park and along US 119, areas zoned as industrial and commercial.

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Traffic and Access *See Mitigation Item 1*	Jefferson Rd serves as a major connector between the communities and businesses west of the capital city (Charleston) and those south of the city. Current congestion and travel delays have led to the development of this project. See Table 2 for details.	• Overall, delays increase. See Table 2 for details. • Vehicles remain constrained to 1 or 2 in either direction. • Offset intersection at Kanawha Tnpk remains. • No changes to access roads and driveways on Jefferson Rd.	• Overall, average control delay decreases. See Table 2 and Table 4 for details. • Vehicles will be spread across additional roadway lanes. See Figure 11 for typical sections. • Offset intersection at Kanawha Tnpk is replaced with a 4-leg intersection. • Forest Edge Dr access is moved southeast. • Dapplewood Rd access is moved north. • Mathias Ln access is moved from Kanawha Tnpk to Jefferson Rd, south of the new bridge. • Access to 3 properties along Jefferson Rd just south of Kanawha Tnpk will be maintained with a road terminating in a cul-de-sac. • Temporary traffic interruptions will occur during construction.	• Overall, average control delay decreases. See Table 2 for details • Vehicles will be spread across additional roadway lanes. See Figure 13 for typical sections. • Offset intersection is replaced with a bridge for north-south through traffic and a roundabout. • Forest Edge Dr access is moved southeast. • Dapplewood Rd access is moved north. • McCune Hollow access is moved northeast, off a ramp to the roundabout. • Direct access to Washington St is removed, and a new access point added at an extension of Park St. • The Liberty St connection to Park St is removed and made into a new cul-de-sac. • An access point is created to the old Jefferson Rd in front of the Community Center. This will be a signalized intersection with Park St. • The old Jefferson Rd will end in a cul-de-sac in front of the State Police HQ. • Temporary traffic interruptions will occur during construction.

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Bicyclists & Pedestrians	Along Jefferson Rd north of Kanawha Tnpk, bicyclists currently use the vehicle lanes without any shoulders, and pedestrians have sidewalks on either side. South of Kanawha Tnpk, bicyclists use the vehicle lanes and unlined 6-foot wide shoulders, and pedestrians have only the shoulders to use. Bicyclists and pedestrians currently have to navigate through the offset intersection at Kanawha Tnpk, which has just 2-foot shoulders and no sidewalks.	The sidewalks and shoulders will not be impacted. Bicyclists and pedestrians will encounter increased vehicle congestion.	The typical section (Figure 11) includes a 6-foot shoulder in either direction for the full length of the new roadway. The shoulders will be striped to include bike lanes in either direction. It would be possible to replace the wide shoulders with a sidepath and buffer, as shown with Alternative 5. Deviations from these widths will occur for the bridges and the roundabout. The existing sidewalk on the east side of Jefferson Road north of the Community Center will be removed. Any other sidewalks disturbed by the widening will be replaced. New crosswalk locations will be investigated further if this alternative is selected. Currently, new crosswalks are proposed in the north in front of the South Charleston Community Center and in the south for accessing the utility access road that serves as a recreation path.	The typical section (Figure 13) includes a 2-foot shoulder in either direction for the full length of the new roadway. On the east side of the new roadway, there will be a 10-foot wide sidepath for bicyclists and pedestrians, with a 5-foot wide grass buffer. Deviations from these widths will occur for the bridge and roundabouts. A pedestrian and bicycle crossing will replace the vehicular crossing of the CSX railroad. New crosswalk locations will be investigated further if this alternative is selected. Currently, new crosswalks are proposed in the north in front of the South Charleston Community Center and in the south for accessing the utility access road that serves as a recreation path. The former will be at a proposed new signalized intersection.
Right-of-Way & Relocations	With the constraints of Davis Creek and steep hillsides in the south and dense neighborhoods, the State	No impact.	Shown in Figure 15, the following acquisitions are required with this alternative: • 26 residences will be relocated	Shown in Figure 16, the following acquisitions are required with this alternative: • 35 residences will be relocated

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
See Mitigation Item 2	Police HQ and the Community Center in the north, Jefferson Rd cannot be widened without relocations of homes and or businesses.		• 1 office building will be relocated, currently including 3 businesses (an insurance office, a barber shop, and a retailer) • 33.3 acres of residential right-of-way required • 3,690 sq ft of easement required from CSX railroad for the widening	• 1 office building will be relocated, currently including 3 businesses (an insurance office, a barber shop, and a retailer) • 38.03 acres of right-of-way of residential right-of-way required • 10,506 sq ft of aerial easement required from CSX railroad for the bridge
Jefferson Place Neighborhood *See Mitigation Item 3*	Jefferson Road provides the only access points to the Jefferson Place neighborhood, which contains approximately 130 houses and one small office building.	Increase in traffic congestion will affect the time to enter and exit Jefferson Place. The community will not be disrupted by relocations.	This alternative will displace all of the houses and the one office building along the western edge of Jefferson Place (currently facing Jefferson Rd), for a total of 14 relocations in this neighborhood. See Figure 15. Access points to/from Jefferson Rd will remain the same.	This alternative will displace a section of houses and the one office building along the western edge of Jefferson Place (currently facing Jefferson Rd), and all of the houses on the western side of Park St., for a total of 20 relocations in this neighborhood. See Figure 16. Access points to/from Jefferson Rd will remain generally the same, though altered at the north end of Park St (see "Traffic and Access" above). The feel of the neighborhood will be altered on this western side of the neighborhood because of the elevated roadway. See "Visual Resources/ Aesthetics."
Economics	The Project Area provides a connection from northern and	Increased traffic congestion may	Both alternatives will remove one office building with 3 business spaces (2 currently active), at 700 Jefferson Rd. Other businesses along Jefferson Rd	

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
	western greater Charleston to the many shops and restaurants along US 119. Also, businesses are located along Jefferson Rd, or immediately adjacent on adjoining roads, including a small strip surrounding a gas station and 7-11 as well as shared residential office spaces in the southern Project Area; a used car dealership in the middle of the Project Area; a small office building with 3 spaces (one currently vacant) and two chain restaurants in the northern Project Area.	dissuade some travelers to local businesses.	will not need to be relocated with either alternative, and may experience additional patronage because of the easier travel conditions and turning lane provided. There are several vacant office/retail spaces within Project Area that could be filled; however, new construction along Jefferson Rd itself is limited by the topography. It is expected that growth in the shopping centers on US 119 and in the WV Regional Technology Park will be facilitated by the improved travel conditions provided by either build alternative. Both of these areas are already developed, with room for expansion of businesses or school and research facilities.	
Environmental Justice	In accordance with Executive Order 12898 this project includes identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. See Appendix C for detailed context.	No impact.	No impact. Both Alternatives primarily use existing right-of-way and skirt the edge of a large neighborhood (Jefferson Place) to limit impacts to the regions' populations. No known environmental justice populations will experience disproportionately high and adverse effects. Potential exists for impact to a minority or low-income individual. WVDOH is affording multiple avenues and opportunities for learning about the project and submitting comments. See Appendix C for more detailed analysis.	

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Community Resources	The following community resources are along Jefferson Rd in the Project Area: United Disciples of Christ, Wesleyan Chapel, South Charleston Fire Station No. 4, South Charleston Public Works Storage Facility, WV State Police HQ, and the South Charleston Community Center. Overlapping the Project Area to the west of Jefferson Rd is the Little Creek Golf Course (visible in Figure 2), and in the south is a utility access path that is used for recreation (pedestrians and bicyclists).	Increase in traffic congestion will affect the time to enter and exit these community facilities.	None of the community resources in the Project Area will require relocation and access to them will improve with the additional roadway capacity and reduced congestion. For the Police Station, the road widening may reduce conflicts for police vehicles exiting the facility (see Figure 7). Access to the utility path that is used for recreation will be maintained, and enhanced by tying into new bicycle/pedestrian lanes (see also "Bicyclists & Pedestrians" above).	None of the community resources in the Project Area will require relocation and access will improve with the additional roadway capacity and reduced congestion. For the Police Station, the road widening will greatly reduce conflicts for police vehicles exiting the facility (see Figure 7). To travel south, Police will have to turn north to the new Jefferson Rd access point; however, overall travel times are still improved. Access to the utility path that is used for recreation will be maintained and enhanced by tying into the new sidepath for pedestrians and bicyclists along Jefferson Rd (see also "Bicyclists & Pedestrians" above).
Wetlands and Streams *See Mitigation Item 4*	There are no wetlands in the Project Area. See Figure 9. Davis Creek runs generally south to north through the full length of the Project Area. It lies west of Jefferson Rd until passing under bridges at Kanawha Tnpk and the railroad, then curves to the east then north again, where	No impact.	This alternative creates two new bridges over Davis Creek: • new 6-lane bridge will carry Jefferson Rd over Davis Creek, upstream of the existing Kanawha Tnpk bridge; • new 2-lane bridge will carry a relocated Mathias Ln from Jefferson Rd just south of McCune	This alternative creates one new bridge over Davis Creek: • new 4-lane bridge will carry Jefferson Rd over Davis Creek, as well as over Kanawha Tnpk and the railroad, in the vicinity of the existing railroad bridge. No bridge piers will be located within Davis Creek. See "Floodplains &

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
	it passes under I-64 and meets the Kanawha River. Jefferson Rd also has approximately 370 ft of culverts conveying tributaries to Davis Creek. Davis Creek originates in the Kanawha State Forest, and within the Project Area is heavily eroded and embedded with sand. Back-flooding from the Kanawha River is a problem. The stream is impaired for certain uses, and has thresholds established for fecal coliform and iron.[3]		Hollow to the western side of Davis Creek. No bridge piers will be located within Davis Creek. See "Floodplains & Floodways" for more detail about the location of piers and abutments. Tributary crossings will require new culverts or pipes and some extended culverts to cross the widened Jefferson Rd. Davis Creek could be affected by pollutants from the additional paved surfaces adjacent to and above the stream. Construction will temporarily affect sedimentation in the streams.	Floodways" for more detail about the location of piers and abutments. Tributary crossings will require new culverts or pipes and some extended culverts to cross the widened Jefferson Rd. Davis Creek could be affected by pollutants from the additional paved surfaces adjacent to and above the stream. Construction will temporarily affect sedimentation in the streams.
Floodways & Floodplains	The Project Area overlaps floodway and 100-year floodplain along Davis Creek. Backwater from the Kanawha River affects low-lying areas.	No new structures will encroach on the 100-year flow. Modeling results show that just	The proposed bridges on Alternative 1 will have piers in the 100-year flow of Davis Creek and abutments will encroach into the 100-year flow. Therefore, this alternative requires a	The proposed bridge on Alternative 5 is not anticipated to interfere with the flow of Davis Creek, although the approach grade from the south will impact the 100-year flood.

[3] In the WV Department of Environmental Protection (WVDEP) 2010 Water Quality Assessment, Davis Creek had a status of "Good" for its "Agricultural" and "Industrial" uses, but was listed as "Impaired" for its "Public Water Supply," "Fish, Shellfish, and Wildlife Protection and Propagation," and "Recreation" uses. Types of impairment were benthic macroinvertebrate bioassessments, fecal coliform levels and iron levels. Subsequently, Total Maximum Daily Loads (TMDLs) were established by the WVDEP and approved by the US Environmental Protection Agency for fecal coliform and iron. The stressors identified included organic enrichment and sedimentation. (WVDEP, 2012)

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
See Mitigation Item 5	A section of Jefferson Rd south of Kanawha Tnpk and just south of the I-64 ramp overpass bridge as well as areas along Kramer Rd lay below the base flood elevation. See Figure 9. Because of potential for flooding in the Project Area, a preliminary hydraulics study was conducted as part of the alternatives analysis. Also, the City of South Charleston and WVDOH have Municipal Separate Storm Sewer Systems (MS4s) in place to regulate storm water.	upstream of the bridge along the future RHL Blvd Extension, an additional 0.06 ft of backwater is created. This increase dissipates to 0.01 ft at the upstream end of the model.	conditional letter of map revision (CLOMR).[4] The mainline bridge on Alternative 1 creates 0.29 ft of additional backwater just upstream of the proposed bridge. Just upstream of the proposed Mathias Lane bridge, the backwater increase raises to 0.36 ft. The backwater increase at the end of the modeled reach (near the US 119 bridge) is 0.08 ft. Additional study will be conducted after design is finalized.	The mainline bridge on Alternative 5 causes no backwater increase; however, the south approach embankment creates some minor variations in backwater. Upstream of the embankment, 0.02 ft of additional backwater is created. This increase dissipates to 0.01 ft at the upstream end of the model. These results do not yet reflect the roundabout, and additional study will be conducted after design is finalized.
Threatened/ Endangered Species	No Federally listed threatened or endangered species are known to occur in the Project Area. WVDOH has consulted with the US	No impact.	No impact. Despite no known occurrences of protected species, WVDOH conducted a bat mist-net survey throughout the Project Area, and no threatened or endangered species were found.	

[4] A CLOMR is the Federal Emergency Management Agency's comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area. Once a project has been completed, the community must request a revision to the Flood Insurance Rate Map to reflect the project. "As-built" certification and other data must be submitted to support the revision request.

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
	Fish and Wildlife Service (USFWS) and the WV Division of Natural Resources (WVDNR).		No further Section 7 consultation under the Endangered Species Act is required. Concurrence with this finding was received from the USFWS in a letter dated August 26, 2015. This correspondence as well as response from the WVDNR are included as Appendix D.	
Historic & Archaeological Resources *See Mitigation Item 6*	Consultation was undertaken with the State Historic Preservation Office (SHPO). A Determination of Eligibility Report and a Phase I Archaeological Survey Report were prepared for the respective Areas of Potential Effect (APEs). The APEs contain one historic property eligible for listing on the National Register of Historic Places (NRHP) and no archaeological sites.	No impact.	No impact will occur to properties listed in or eligible for listing in the NRHP, and no further investigation is necessary. The SHPO provided final concurrence with these findings in letters dated January 27th and November 30th, 2015 (Appendix E).	No impact will occur to any properties known to be listed in or eligible for listing in the NRHP. The SHPO provided final concurrence with these findings in letters dated January 27th and November 30th, 2015, as well as in a letter dated April 12, 2016 regarding a cemetery that is within the APE for the proposed roundabout at Kanawha Tnpk (Appendix E).
Air Quality *See Mitigation Item 7*	The proposed project is in a designated "maintenance area" for particulate matter ($PM_{2.5}$), and in an area that attains the ozone and carbon monoxide air quality standards. Appendix F contains full explanation of the terms and analysis results presented here.	No impact.	An Air Quality Analysis was prepared for the project and is included in Appendix F. There were no regional or project level impacts as a result of the air quality analysis. The proposed action is a "Project with No Meaningful Potential MSAT Effects" for which no MSAT analysis is required. However, for both alternatives, emissions are virtually certain to be lower than present levels in the design year (2030) as a result of federal control programs that are projected to reduce annual MSAT emissions. There will be temporary air quality impacts associated with dust and equipment emissions from construction.	

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Noise *See Mitigation Item 8*	The Project Area lies within a mixture of urban and suburban settings. The existing noise environment already contains areas where standard noise criteria are exceeded. See Appendix G for full analysis.	There are currently 23 residences receiving noise that exceeds noise abatement criteria. These residences are spread along the full length of the project. Twenty (20) of these impacted houses will be relocated with one or both of the Build Alternatives.	There are 2 predicted impacts due to exceedances of noise abatement criteria and no impacts due to increases over existing conditions. The 2 noise impacts are houses, though they contain or have contained office spaces at different times, near the south end of the project. The number is far less than with the No Build Alternative because houses that will be relocated are not included. See Appendix G for full analysis. There will be temporary noise impacts associated with construction.	There are 3 predicted impacts due to exceedances of noise abatement criteria and no impacts due to increases over existing conditions. The 3 noise impacts are houses, though they contain or have contained office spaces at different times, near the south end of the project. The number is far less than with the No Build Alternative because houses that will be relocated are not included. See Appendix G for full analysis. There will be temporary noise impacts associated with construction.
Visual Resources/ Aesthetics *See Mitigation Item 9*	The Project Area has a mixture of urban and suburban views, without particularly outstanding views from or of the areas of proposed construction.	No impact.	Minor impact. The project predominantly widens an existing road where views of Jefferson Rd already exist. The new bridges will create additional views of Jefferson Rd and Mathias Ln.	Generally minor impact, with more substantial impact for some residents in the northern Project Area. The project predominantly widens an existing road where views of Jefferson Rd already exist. The new bridge will create additional views of Jefferson Rd. Residents in the western portion of the Jefferson Place neighborhood will have the new bridge in close proximity. The bridge passes over Pennsylvania Ave, then tapers to the

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
				ground with retaining walls, which will be in front of houses on the east side of Park St, and behind remaining houses on the old Jefferson Rd.
Hazardous Materials *See Mitigation Item 10*	A screening for hazardous materials was conducted for the Project Area, and geology, mines and minerals mapping were reviewed. See Appendix H for more details.	No impact.	Several properties of concern are adjacent to or within the right-of-way, with Properties of *high* concern including the gas station at the 7-Eleven and the Public Works Department facility. See Appendix H for additional details and maps. Properties may include asbestos-containing materials, heating oil tanks, and/or lead based paint. Surveys of all buildings to be demolished will be conducted in accordance with local, state and federal regulations. For both alternatives, the risks associated with construction in any of these sites will be reevaluated as part of a Phase I Environmental Assessment for properties intended for and prior to right-of-way acquisition.	Several properties of concern are adjacent to or within the right-of-way, with Properties of *high* concern including the gas station at the 7-Eleven and the Public Works Department facility. See Appendix H for additional details and maps. Properties may include asbestos-containing materials, heating oil tanks, and/or lead based paint. Surveys of all buildings to be demolished will be conducted in accordance with local, state and federal regulations. For both alternatives, the risks associated with construction in any of these sites will be reevaluated as part of a Phase I Environmental Assessment for properties intended for and prior to right-of-way acquisition. One plugged salt well lies within the Alternative 5 right-of-way just east of Davis Creek and south of the railroad tracks.

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
Utilities *See Mitigation Item 11*	The WVDOH performed a subsurface utility engineering survey that has been incorporated into the plans. The project is along a major roadway with dozens of houses and businesses. Any alternative would require relocations.	No impact.	This alternative requires replacing a main sewer pump station near McCune Hollow, which adds millions of dollars to the cost. There will be temporary utility service outages during construction.	There will be temporary utility service outages during construction.
Section 6(f)[5]	There are no properties in the Project Area purchased using the L&WCF.	No impact.	No impact.	No impact.
Section 4(f)[6]	The Project Area contains one Section 4(f) resource: the Little Creek Golf Course, which is a publically owned public park.	No impact.	No impact.	No impact.
Cumulative Impacts[7]	For each resource experiencing impact from the proposed project - traffic,	Limited effects. The area will likely experience worsening	Limited effects. Traffic conditions will improve with the combined effects of the RHL Blvd Extension and the proposed project. The traffic modeling results reported in this EA already include the assumption that RHL Blvd	

[5] In accordance with Federal regulations, projects require coordination with the National Park Service for impacts to land acquired using the Federal Land and Water Conservation Fund (L&WCF). 36 CFR 59.3

[6] Section 4(f) of the Department of Transportation Act of 1966 provides protections to significant publicly-owned public parks, recreation areas, wildlife and waterfowl refuges, and significant historic sites. 49 USC Section 303, 23 CFR Part 774

[7] Cumulative impact is “the impact on the environment which results from the incremental impact of the action when added to the effects of other past, present, and reasonably foreseeable future actions.” 40 CFR 1508.7

Resource	Context	No Build Alternative	Alternative 1	Alternative 5
	noise, residences, businesses, Davis Creek, and floodplains - temporal and spatial study areas were considered for impact by other projects. Also, indirect impacts were considered in the analysis. Indirect effects are discussed under "Land Use." For all impacts, the design year of 2030 was considered as the foreseeable future. Spatial study areas were the project area itself (Noise), the City of South Charleston (traffic and relocations), and banks and waterways of the Davis Creek watershed to points approximately 1,000 ft upstream of the Project Area (streams and floodplains). The only other reasonably foreseeable project within the temporal and spatial study areas for the impacted resources is the RHL Blvd Extension, identified in Figure 2 and Figure 5.	traffic and associated noise. The traffic modeling results reported in this EA already include the assumption that the RHL Blvd Extension is constructed, so the cumulative effect to traffic and noise is reported. Structures along Kramer Rd are impacted by flooding.	Extension is constructed, so the cumulative effect on floodplains, traffic and noise is reported. There is potential for cumulative effect on Davis Creek, its tributaries, and their floodplains with construction of the proposed RHL Blvd Extension and the proposed Jefferson Rd improvements. The preliminary hydraulic and hydrologic modeling results reported in this EA already include the assumption that the RHL Blvd Extension is constructed. However, a detailed hydraulic and hydrologic analysis will be performed during final design of both the Jefferson Road and RHL projects. The effects will be addressed through coordination with the US Army Corps of Engineers (USACE) and Floodplain Managers required for the projects to proceed to construction. Indirect development is likely to be in areas where impervious surfaces already exist; however, additional buildings and parking could possibly be added to the WV Regional Technology Park and the Shoppes at Trace Fork. Any other indirect development of undeveloped land will generally be limited by topography and the Little Creek Park and Golf Course. Drainage from such development would be regulated under the South Charleston MS4.	

Table 7. Mitigation for Impacts

Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing of Mitigation
1 – Traffic and Access	Temporary disruption to traffic during construction.	All homes not removed by the project will have access maintained. The number of access points into Jefferson Place is not changed. A maintenance of traffic plan will be developed and implemented during construction to assure both motorist and construction worker safety. This plan will be developed using guidelines of FHWA, the American Association of State Highway and Transportation Officials, and WVDOH. Draft details of traffic maintenance are as follows: Alternative 1: Traffic will be maintained on Jefferson Rd, north of Kanawha Tnpk, by using phased construction in the widening process. South of Kanawha Tnpk at the proposed bridge, traffic will be maintained by phased construction as well as constructing some temporary roadway to shift traffic to the east and allow the eastern abutment of the bridge to be constructed. South of the bridge site, traffic will be maintained on existing Jefferson Rd while the widening is constructed to the east. Alternative 5: Traffic will be maintained on existing Jefferson Rd while the widening for the northbound lanes are constructed to the east. At that point, traffic will be shifted to the new northbound lanes while widening is completed for the southbound lanes to the west. Traffic will need to be shifted with phased construction at the tie-in point near the I-64 ramp.	WVDOT	During Construction

Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing of Mitigation
2 – Right-of-Way & Relocations	26 (Alternative 1) or 35 (Alternative 5) residences and 1 office building will be relocated.	Acquisition and relocation will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended.	WVDOT Right-of-Way Division.	Prior to and during construction.
3 – Jefferson Place Neighborhood	Of approximately 130 residences, 14 residences and 1 office building (Alternative 1) or 19 residences and 1 office building (Alternative 5) will be relocated. See also Item No. 7.	Impacts are minimized to the extent practicable and kept to the edge of the neighborhood to maintain a contiguous neighborhood to the east of the new Jefferson Rd. The same number of access points to the neighborhood is maintained, and neighborhood needs will be considered with crosswalk design.	WVDOT Engineers	Design
4 – Wetlands and Streams	Potential increase of run-off from roadways. Temporary effects from construction activities.	Special measures will be developed and agreed upon in coordination with the City of South Charleston to achieve applicable wasteload allocations established in TMDLs. Mitigation for new culverts and pipes will be resolved in coordination with the USACE as part of the Clean Water Act (CWA) permitting process. Best Management Practices (BMPs) will be used during construction to control sedimentation and erosion and protect water quality.	WVDOT and Contractor	Construction
5 – Floodways & Floodplains	Rise in backwater along Davis Creek.	Special measures for runoff will be coordinated between the WVDOH and City of South Charleston to regulate storm water in accordance with their MS4s. WVDOH will purchase properties impacted by raised backwater levels, the precise location of which will be determined after results of final design and a more refined	WVDOT	Prior to construction.

Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing of Mitigation
		hydrology and hydraulics study. See Item No. 2 regarding relocations.		
6 – Historic and Archaeological Resources	No impact anticipated; however contingencies are in place for unforeseen circumstances with regard to archaeological findings.	If any unanticipated archaeological discoveries are encountered during project implementation, work will be suspended in the area of the discovery until the WVDOH has developed and implemented an appropriate treatment plan in consultation with the SHPO pursuant to 36 CFR 800.13(b).	WVDOT	Prior to and during construction.
7 - Air Quality	Temporary construction impact.	Air pollution control measures will be included with the project in accordance with the WVDOT's Standard Specifications for Road and Bridge Construction, and applicable regulations of the West Virginia Air Pollution Control Commission.	WVDOT and Contractor	Construction
8 - Noise	No substantial noise level changes; 2 to 3 residences will experience a noise abatement criteria impact. However, potential abatement measures are not feasible. Temporary impact from construction noise.	Control of construction noise will be governed by WVDOT's Standard Specifications for Road and Bridge Construction.	WVDOT and Contractor	Construction
9 - Visual Impact	With Alternative 5, visual impact to residences in Jefferson Place neighborhood, particularly those adjacent to the new proposed retaining walls.	Visual impact will be considered during final design and in light of any comments received on the subject after distribution of the EA.	WVDOT	Prior to and during construction

Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing of Mitigation
10 - Hazardous Materials	Over a dozen properties of hazardous materials concern lie within the proposed alternative right-of-ways.	Prior to right-of-way acquisition, the risks associated with construction in any of the hazardous materials sites will be reevaluated as part of a complete Phase I Environmental Site Assessment (ESA) for properties within the right-of-way. For sites with a High potential to encounter hazardous waste and/or sites identified during Phase I ESAs, subsequent sampling may be applicable as part of Phase II ESAs. Following completion of Phase I and Phase II ESAs, the final design may be modified to avoid the contaminated material by either adjusting the proposed construction work to avoid the contaminated areas (when practical), or to manage and/or dispose of contaminated materials in accordance with the applicable federal and state regulations. Should hazardous materials be encountered prior to or during the construction phase, any identified waste will be managed according to applicable federal and state laws, ordinances, and regulations. Proper worker and environmental safety protocols will be followed.	WVDOT	Prior to and during construction.
11 - Utilities	There will be temporary disruptions to utility services.	Utility outages will be coordinated with utility companies for proper customer notification. Disruptions will be minimized to the extent practicable, with a customer's water outage kept to less than one day at a time, barring unforeseen circumstances.	WVDOT	Prior to and during construction.

Additional Clearances and Permits Required for this Project

The following clearances and permits are required before project implementation:

- CWA Section 404 Permit from the USACE.
- CWA Section 401 Certification from the WVDEP.
- Registration for construction site storm water general permit with the WVDEP.
- Both WVDOH and the City of South Charleston have a Municipal Separate Storm Sewer System (MS4) for which construction and post-construction stormwater is regulated. WVDOH will coordinate with the City during final design to plan management and mitigation for stormwater as necessary in accordance with approved plans.

Outreach and Opportunities for Stakeholder Participation

As part of the planning and environmental linkage process for investigating options to improve the Jefferson Road corridor, the WVDOH, Program Planning & Administration Division completed an initial phase of environmental analysis and agency and public outreach. The process included meetings and phone call interviews with stakeholders, and WVDOH hosted an informational workshop public meeting on March 12, 2013 at the South Charleston Recreation Center. Following the meeting and a public comment period, the PEL study (Appendix A) was produced in September of 2013.

Comments received following the March 2013 public workshop included general comments of support for the project, comments regarding the design of the facility, and comments concerning potential environmental impacts. Most comments fell into one of four categories, which are listed below along with a summary of how the concern was addressed in the alternatives analysis.

1) Support for a grade-separated railroad crossing.

The grade separation for the railroad crossing was considered an important element to include in one of the alternatives carried forward for detailed analysis.

2) Support for bicyclist and pedestrian facilities.

Any alternative carried forward would include improvements to bicyclist and pedestrian facilities.

3) Concern for impacts to Jefferson Place neighborhood (e.g., relocations, access, and quality of life).

The alternatives carried forward do not bisect the Jefferson Place neighborhood, and minimize relocations to the extent practicable while incorporating other important project elements.

4) Concern for flooding implications of the project.

Any alternative carried forward would undergo a hydraulic analysis for preliminary assessment and the Selected Alternative would undergo detailed analysis yielding mitigation measures for preventing additional flooding problems.

An informational workshop public meeting will take place during the comment period for this EA at the South Charleston Community Center on July 11, 2016.

In addition to the public meeting, WVDOH maintains a public website for disseminating information about projects: http://www.transportation.wv.gov/highways/engineering/comment. Through this website, project materials are available for download, and comments may be submitted electronically.

Distribution of the Environmental Assessment

The following agencies and government representatives have been mailed a copy of this EA prior to the public meeting date:

Federal Agencies

Barbara Okhorn
U.S. Environmental Protection Agency
Region 3- Environmental Services Division
Office of Environmental Programs
Mail Code: 3EA30
1650 Arch Street
Philadelphia, PA 19103-2029

Jessica Martinsen
U.S. Environmental Protection Agency
Region 3- Environmental Services Division
Office of Environmental Programs
Mail Code: 3EA30
1650 Arch Street
Philadelphia, PA 19103-2029

Ginger Mullins
Chief, Regulatory
U.S. Army Corps of Engineers
Huntington District
CELRH-RD
502 Eighth Street
Huntington, WV 25701-2070

John Schmidt
Supervisor
U.S. Fish and Wildlife Service
West Virginia Field Office
694 Beverly Pike
Elkins, WV 26241

Norm Bailey
Resource Conservationist
Natural Resource Conservation Service
U.S. Department of Agriculture
1550 Earl Core Road, Suite 200
Morgantown, WV 26505

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

West Virginia Agencies

Randy Huffman
Cabinet Secretary
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

Patty Hickman, Acting Division Director
West Virginia Department of Environmental Protection
Division of Land Restoration
Office of Environmental Remediation
601 57th St, Room 1072
Charleston, WV 25304-2345

Scott G. Mandirola
Director, Division of Water and Waste Management
Permitting and Engineering Branch
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 253041-2345

William Durham
Director, Office of Air Quality
West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304-2345

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

Robert Fala
Director, West Virginia Division of Natural Resources
Building 74
324 Fourth Avenue
South Charleston, WV 25303

Susan Pierce
Deputy State Historic Preservation Officer
Division of Culture and History
1900 Kanawha Blvd East
Charleston, WV 25305

Danielle LaPresta
Executive Director
Preservation Alliance of WV
421 Davis Ave #3
Elkins, WV 26241

Regional Agencies and Organizations

Frank A. Mullens, Jr.
Mayor, City of South Charleston
P.O. Box 8597
South Charleston, WV 25303

Mr. Gerald Burgy
Floodplain Manager, City of South Charleston
1103 Jefferson Road
South Charleston, WV 25303

Mr. Mark Felton
Executive Director
Regional Intergovernmental Council
315 D Street
South Charleston, WV 25303

Troy Creasy
Project Manager II
CSX Capital Public Projects
1610 Forest Avenue, Suite 120
Richmond, VA 23229

Davis Creek Watershed Association
Post Office Box 5556
Charleston, West Virginia 25361

Mr. Ronald Duerring, Superintendent
Kanawha County Schools
200 Elizabeth Street
Charleston, WV 25311

Senators, and Delegates

Senator Corey Palumbo
Room 209W, Building 1
State Capitol Complex
Charleston, WV 25305

Senator Tom Takubo
Room 417M, Building 1
State Capitol Complex
Charleston, WV 25305

Delegate Chris Stansbury
Room 209E, Building 1
State Capitol Complex
Charleston, WV 25305

Delegate Andrew Byrd
Room 151R, Building 1
State Capitol Complex
Charleston, WV 25305

Delegate John McCuskey
Room 476M, Building 1
State Capitol Complex
Charleston, WV 25305

Delegate Eric Nelson
Room 462M, Building 1
State Capitol Complex
Charleston, WV 25305

References

Barton-Aschman Associates, Inc. 1996. Charleston Metropolitan Transportation Plan, Travel Demand Models Calibration and Documentation. Prepared for June 1996

Kanawha County Commission. 2014. Twenty-twenty Vision: Kanawha County Comprehensive Plan. Dated June 2014.

Regional Intergovernmental Council (RIC). 2013. Metro Mobility 2040: Kanawha-Putnam Metropolitan Transportation Plan. Adopted in September 2013.

_____. 2012. Transportation Improvement Program, FY 2012-2015.

Stantec. 2015. Jefferson Road Improvements Traffic Analysis, State Project U320-601-0.00 03. Prepared for TRC Engineers, Inc. and WVDOH. Final Report dated August 2015.

TRC Company, Inc. 2012. Jefferson Road (WV 601) Design Study. Prepared for WVDOH. Dated June 14, 2012.

TRC Company, Inc. 2013. Jefferson Road (WV 601) Planning Study Final Report. Prepared for WVDOH. Dated March 7, 2013.

TRC Company, Inc. 2015. Draft Design Report for Jefferson Road Design Study (Phase I) & NEPA Preparation. Prepared for WVDOH. Dated December 14, 2015.

West Virginia Department of Transportation, Division of Highways (WVDOH). 2004. WV 601 Jefferson Road Kanawha County. A planning study conducted by the Program Planning & Administration Division. August 2004.

West Virginia Department of Transportation (WVDOT). 2016. 2016-2021 Statewide Transportation Improvement Program. Dated February 2016.

West Virginia Department of Environmental Protection (WVDEP). 2012. Total Maximum Daily Loads for Selected Streams in the Lower Kanawha River Watershed, West Virginia. Final USEPA Approved Report May, 2012.

Appendices (contained on disc)