BEAVER TO SOUTH EISENHOWER DRIVE PROJECT (BECKLEY Z-WAY) NOISE ANALYSIS RALEIGH COUNTY, WEST VIRGINIA STATE PROJECT: X341-ZWA/Y-6.22

PREPARED FOR

DIVISION OF HIGHWAYS

PREPARED BY

SKELLY AND LOY
ENGINEERING - ENVIRONMENTAL CONSULTANTS

JUNE 2018

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PREPARED FOR

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JUNE 8, 2018

R15-0537.000

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A noise analysis was conducted for the Beaver to South Eisenhower Drive Project (Beckley Z-Way) located in Raleigh County, West Virginia. This segment of the proposed Beckley Z-Way connects U.S. Route 19 near the U.S. Route 19 (Ritter Drive) and WV 307 (Airport Road) intersection directly to I-64 at the I-64 Exit 124 Beckley-Eisenhower Drive Interchange. The goals of this transportation improvement project are to reduce congestion and delays, improve level of service, and improve safety on nearby roadways and support transportation system continuity in the area. The construction of this segment of the Z-Way will help alleviate congestion in the Beaver area, especially at the U.S. Route 19 and WV 307 intersection, by providing a more direct route and more convenient access to the commercial areas along Eisenhower Drive and Robert C. Byrd Drive.

The noise analysis involved the measurement of existing noise levels, modeling of existing (2017) and design year (2037) noise conditions, and design year noise impact assessment and noise abatement evaluations within the project study area. Noise-sensitive land uses were identified and grouped into seven unique Common Noise Environments (CNEs) to facilitate the analysis. Within these CNEs, noise levels at 40 noise receptors (representing 53 equivalent residential units) were predicted and compared to the Federal Highway Administration (FHWA)/West Virginia Division of Highways (WVDOH) noise abatement criteria (NAC) to determine noise impacts.

Noise impacts for the design year (2037) conditions were identified within two of the seven CNEs. Due to the presence of side roads and driveways in the vicinity of the CNE E noise-impacted property, the necessary linear space to construct an effective noise barrier is not available. Although noise abatement consideration is warranted for this noise-impacted property, it was determined that noise abatement is not feasible.

A noise barrier to reduce elevated traffic noise levels at a noise-impacted property within CNE G was evaluated to determine feasibility and reasonableness. Although this noise barrier was found to be feasible and provide the required 5 dBA of noise reduction, the cost per benefited receptor of this barrier exceeds the allowable $30,000 per benefited receptor reasonableness criteria.

II. INTRODUCTION

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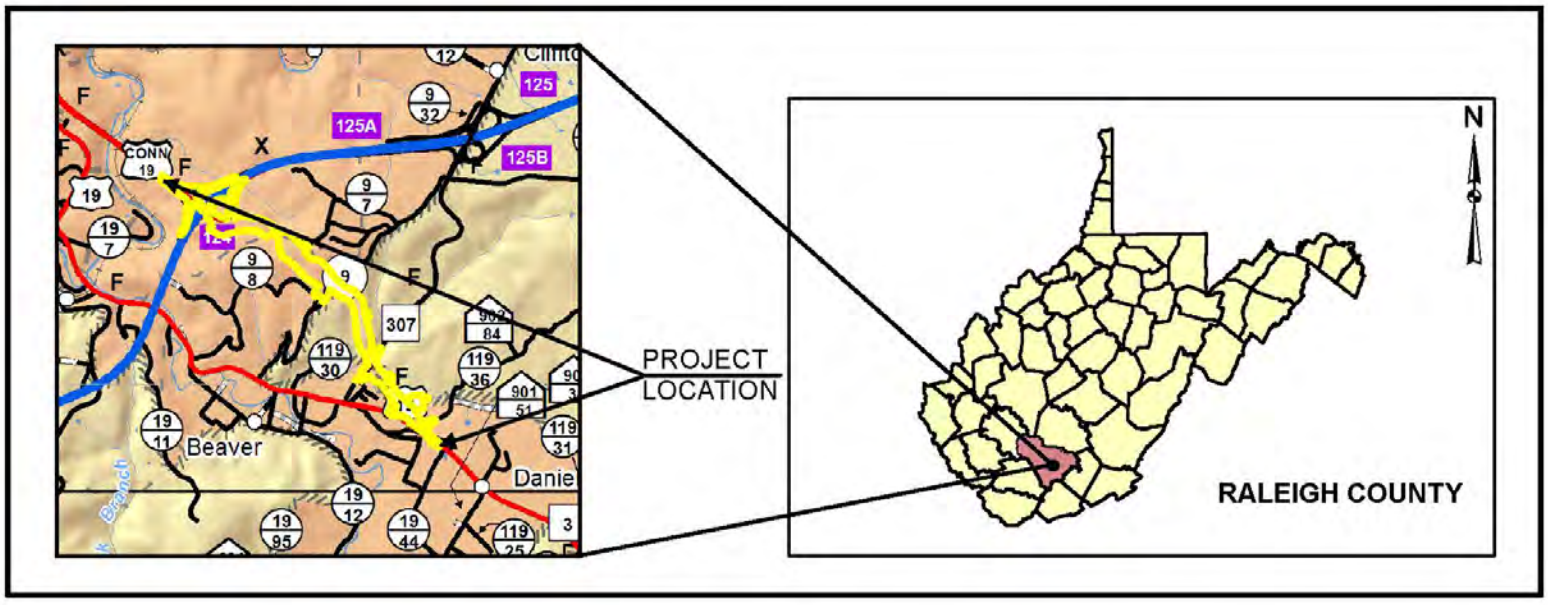
A noise analysis was conducted for the Beaver to South Eisenhower Drive Project (Beckley Z-Way) located in Raleigh County, West Virginia. The Beaver to South Eisenhower Drive Project begins approximately 400 feet to the southeast of the existing intersection of US 19 (Ritter Drive) and County Route 19/36 (Old Crow Road). This segment of the Z-Way will diverge to the northwest away from U.S. Route 19 and continue to the northwest, crossing over WV 307 (Airport Road) approximately 1,100 feet north of the U.S. Route 19 and WV 307 intersection at Beaver. A connector road between the Z-Way and WV 307 will be constructed immediately southwest of this overpass. From WV 307 the alignment continues to the northwest through mountainous terrain where a direct connector road will be provided near the intersection of County Routes 9/8 (Skyline Drive) and 9/9 (Orchard Hill Road), providing access to residential areas west of the new alignment. The Z-Way will continue for an additional 3,000 feet northwest to the northern terminus location at the I-64 Exit 124 Beckley-Eisenhower Drive Interchange. This segment of the Z-Way will be a new facility which connects U.S. Route 19 directly to I-64. The design speed will be 45 miles per hour. Figure 1 presents the location of the project study area.

FIGURE 1
PROJECT LOCATION



The goals of this transportation improvement project are to reduce congestion and delays, improve level of service, and improve safety on nearby roadways and support transportation system continuity in the area. The construction of this segment of the Z-Way will help alleviate congestion in the Beaver area, especially at the U.S. Route 19 and WV 307 intersection, by providing a more direct route and more convenient access to the commercial areas along Eisenhower Drive and Robert C. Byrd Drive.

The objective of this noise analysis is to assess the potential traffic noise impacts associated with the construction of this transportation improvement project and to evaluate potential noise abatement measures wherever noise impacts are predicted to occur. This report presents a summary of the steps involved in the traffic noise analysis and includes a description of noise terminology, the applicable standards and criteria, noise monitoring and modeling methodology, noise impact evaluation, construction noise considerations, and information for local government officials.

All highway noise impact assessment procedures, noise abatement criteria, and documentation are in accordance with the West Virginia Department of Transportation Division of Highway's Statewide Noise Policy, May 26, 2011. WVDOH guidelines are based on the FHWA Federal Aid Policy Guide 23 CFR 772, U.S. Government Printing Office, updated July 13, 2011.

III. FUNDAMENTALS OF SOUND AND METHODOLOGY

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A. FUNDAMENTALS OF SOUND

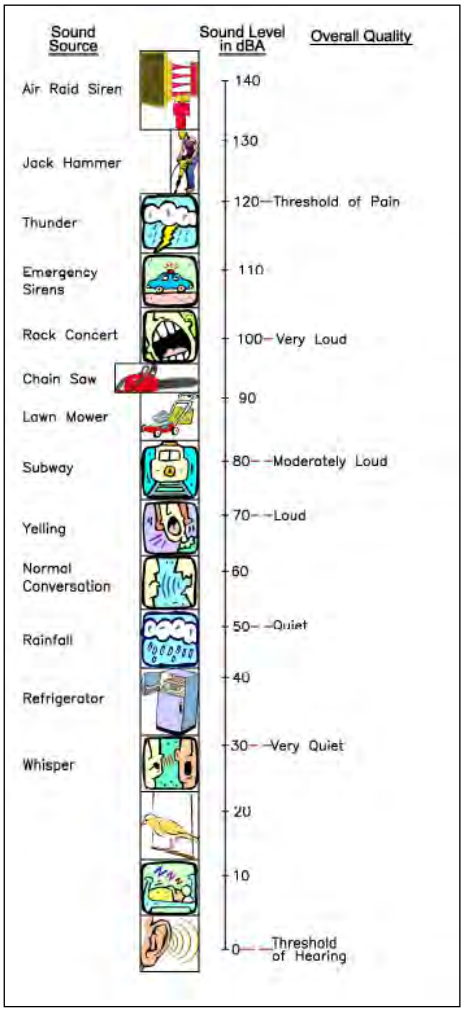
Sound is the vibration of air molecules in waves similar to ripples on water. When these vibrations reach our ears, we hear what we call sound. Noise is defined as "unwanted sound." Therefore, it can be considered a psychological phenomenon and not a physical one. The roar of racecars adds to the excitement of spectators and hence would be considered sound. This same roar may annoy nearby neighbors, thereby becoming noise. Factors playing a role in the perception of sound include magnitude, amplitude, duration, frequency, source, and receiver.

The intensity or loudness of sound is measured in units referred to as decibels (dB). Sound waves are created by the rapid movement of an object, and the rate at which the object moves back and forth is called its frequency, measured in hertz (Hz). While the human ear can detect sounds from about 20 to 20,000 Hz, it is more sensitive to frequencies between 500 and 4,000 Hz. To account for this occurrence, the A-weighted scale has been developed to place an emphasis on those frequencies which are more detectable to the human ear. The A-weighted scale, which has been in existence for over 40 years, is generally used in community and city noise ordinances and is expressed in units of dBA (decibels in the A-weighting). Researchers have established a correlation between the measurement of sound, the A-weighted decibel (dBA), and its associated perceived human response. Figure 2 represents this correlation of qualitative and quantitative descriptions. The A-weighted scale weighs the sound measurement unit of decibels to match the response of the human ear. It accounts for the fact that sounds of equal amplitude but different frequencies are not necessarily perceived to be equally loud.

Because sound is actually an energy level, it must be recorded on a logarithmic scale and expressed in logarithmic units called decibels (dB). Given this scale, a doubling of a noise source will result in a three-decibel increase in total level (i.e., 50 dBA + 50 dBA = 53 dBA, not 100 dBA). Typically, a change in sound level between 2 and 3 dBA is barely perceptible while a change of 5 dBA is readily noticeable by most people. A 10 dBA increase is usually perceived as a doubling of loudness and, conversely, noise is perceived to be reduced by one-half when a sound level is reduced by 10 dBA.

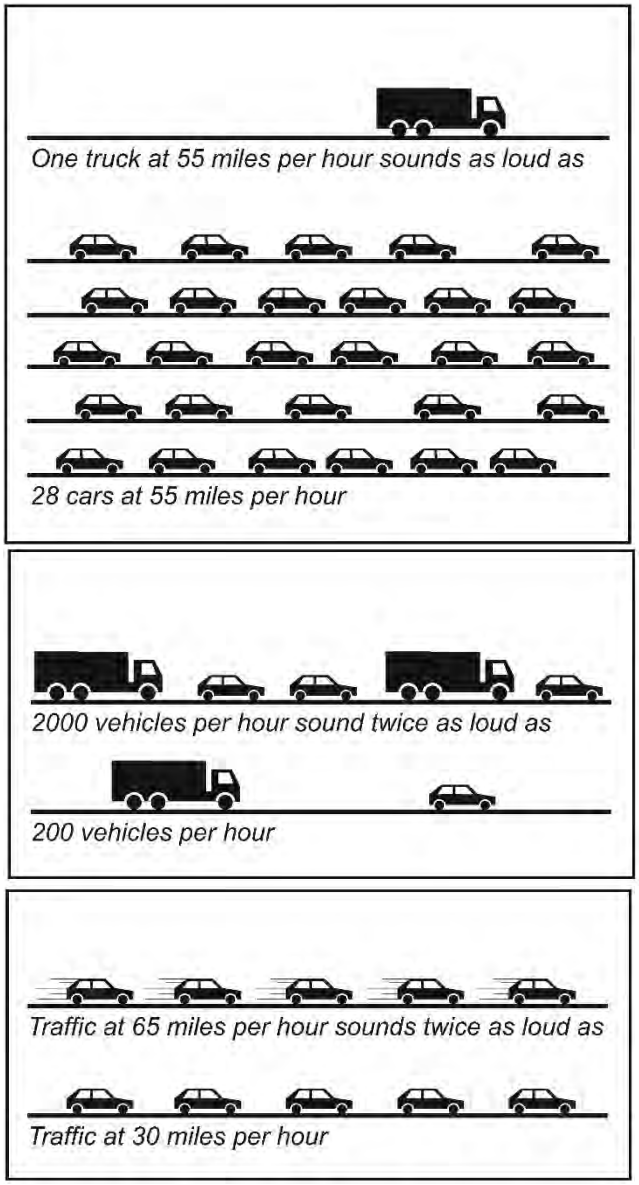
The principal noise sources of highway vehicles are the exhaust system, engine, and tires. Exhaust noise is typically controlled by mufflers, assuming that they are used and are functioning properly. Engine noise can be controlled only by vehicle manufacturers and proper

FIGURE 2
COMMON SOUND LEVELS



maintenance, factors over which WVDOH has no control. Tire noise is generated by the interaction of each vehicle's tires with the road surface. Engine and exhaust noise are usually louder than tire noise at vehicular speeds under 30 miles per hour. The reverse is normally true for vehicular speeds over 30 miles per hour. Highways are typically dominated by tire noise while local streets are typically dominated by engine and exhaust noise. The overall noise level generated by vehicles on a highway depends on the number of vehicles, the speed of the vehicles, and the types of vehicles. Figure 3 depicts generally how these factors influence noise levels.

FIGURE 3
TRAFFIC NOISE RELATIONSHIPS



B. METHODOLOGY

The first step of the preliminary design noise analysis is to assess the existing acoustical environment. Noise monitoring of existing conditions is the primary means of establishing background noise levels and propagation characteristics throughout the project area. The initial phase of the monitoring process is the identification and selection of noise-sensitive receptors. Sensitive receptors are defined as those land uses which are especially susceptible to noise

impacts. These may include hospitals, schools, residences, motels, hotels, recreational areas, parks, and places of worship. The sensitive receptors identified within the project study are considered Activity Categories B and C as defined by the FHWA traffic noise regulations (23 CFR Part 772) and are summarized in Table III-1. This table provides a brief description of the various activity categories as well as the absolute federal/state noise criteria for each.

TABLE III-1
NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL IN DECIBELS (DBA)

ACTIVITY CATEGORY	Leq(h)	DESCRIPTION OF ACTIVITY CATEGORY
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B2	67(Exterior)	Residential
C2	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E2	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A, B, or C.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

[1] Impact thresholds should not be used as design standards for noise abatement purposes.
[2] Includes undeveloped lands permitted for this activity category
Source: 23 CFR Part 772

Upon selection of noise-sensitive receptors, monitoring of the existing acoustical environment at these receptors is conducted. All monitoring for this project was performed using Metrosonics dB-3080 sound analyzers. Field calibration of the meters was performed immediately prior to noise monitoring using a Metrosonics cl-304 sound level calibrator, as per standard measurement protocol. The sound analyzers were post-calibrated subsequent to the measurements using a Metrosonics cl-304 sound level calibrator and found to be operating

within the proper tolerance. This equipment meets all requirements of the American National Standard Specification for Sound Level Meters, ANSI S1.4-1983 (R1990), Type 2.

Noise measurements were in the A-weighted scale and reported in decibels (dBA). The data collection procedure involved the Leq measurements in consecutive 30-second intervals. This method allows individual time intervals that include noise events unrelated to traffic noise (such as aircraft overflights) to be excluded from consideration. Hourly average noise levels [Leq(h)] were derived at each location from the 20-minute Leq values. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as wind speed, humidity, and ambient temperature. Monitoring was conducted in accordance with the U.S. Department of Transportation, FHWA "Measurement of Highway-Related Noise," FHWA Report No. FHWA-PD-96-046, May 1996.

Traffic counts are also taken on roadways which significantly contribute to the overall noise levels during the monitoring period. Traffic is grouped into one of three categories: cars, medium trucks, and heavy trucks. Medium trucks are defined as vehicles having 2 axles and 6 wheels (between 4,500 Kg and 12,000 Kg). Heavy trucks are vehicles having 3 or more axles (greater than 12,000 Kg); cars are the remainder.

Upon completion of noise monitoring, a computer model of the existing roadway network and monitored receptors is constructed using data from digital topographical maps, highway design files, traffic volumes recorded in the field, and surveying (GPS) of existing terrain. Modeling of the project area is accomplished by applying the FHWA Traffic Noise Model (TNM) computer model, Version 2.5. This program is described in the U.S. Department of Transportation "FHWA Traffic Noise Model User's Guide," FHWA-PD-96-009, January 1998. The model has been established as a reliable tool for representing noise generated by highway traffic.

To represent the actual conditions, a numerical coordinate system of the roadway network and receivers is used. The TNM computer model uses a three-dimensional, Cartesian coordinate (X, Y, and Z) system to represent the roadways, terrain features, and receivers in the study area. Noise levels can then be predicted for various scenarios of traffic flow, geometrics, and topography. In addition to the definition of physical features within the coordinate geometry system, traffic volumes and speeds for each of the three vehicle types are entered into the model as two other categories of input variables.

The modeling process continues with model validation in accordance with standard noise modeling procedures. This is performed by comparing the monitored noise levels with

noise levels generated by the computer model, using the traffic volumes and speeds that were collected during the monitoring process. This comparison ensures that reported changes in noise levels between future and existing conditions are due to changes in conditions and do not erroneously reflect discrepancies between the modeling and monitoring techniques. A difference between the monitored and modeled levels of three decibels or less is considered acceptable (this is the limit of change detectable by typical human hearing) per standard noise model validation procedures. Following validation of the existing conditions models, additional modeling sites are added to thoroughly predict existing noise levels throughout the project and to determine the baseline sound-level data at these modeling sites where no field measurements were made.

The next step in the noise analysis is to project future, design year noise levels with the proposed alignment in place and determine if the future levels will approach or exceed the noise abatement criteria (NAC). If the criteria are approached or exceeded at any receptor (or residence represented by that receptor), abatement considerations are warranted to attempt to provide a substantial noise reduction at the noise-impacted receptor. The future design model is created by adding the roadway design into the existing conditions model. Projected design year traffic volumes, compositions, and speeds are assigned to all roadways, and future noise levels are predicted.

After future noise levels have been predicted, mitigation analysis is performed. The three steps of mitigation analysis are determining where noise abatement consideration is warranted, determining if noise abatement is feasible, and determining if noise abatement is reasonable. Abatement consideration is warranted where future noise levels have been predicted to exceed the NAC. Federal procedures require the state to specify the level which “approaches” the criteria. WVDOH defines approaching as within 1 dBA of the NAC. In addition, federal procedures stipulate that abatement considerations are required if the project results in a “substantial noise increase” above existing conditions. WVDOH regulations state that if a future predicted noise level at any given receptor approaches or exceeds the appropriate abatement criterion or if future predicted traffic noise levels substantially exceed the existing noise levels by 15 dBA or greater, abatement considerations are required.

After identifying areas where abatement consideration is warranted, the feasibility of potential mitigation is then analyzed. Feasibility deals with engineering considerations; specifically, can a substantial noise reduction be achieved given the conditions of a specific location. Is the ability to achieve noise reduction limited by:

1) topography;
2) animal migratory paths;
3) cultural resources such as historic places;
4) access requirements for driveways, ramps, etc.;
5) maintenance issues and utility encumberments;
6) the presence of local cross streets; or
7) other noise sources in the area, such as aircraft, trains, or industry?

All of these considerations affect the ability of noise barriers to achieve an actual noise reduction. It is state policy that construction of a noise barrier is NOT FEASIBLE if a noise reduction of at least 5 dBA cannot be achieved for an impacted receptor.

If mitigation has been determined to be feasible, the reasonableness of the mitigation is analyzed. Reasonableness is a more subjective criterion than feasibility. This determination takes into account the cost-effectiveness of the mitigation, acoustic performance, and the desires of individuals impacted by highway traffic noise.

23 CFR 772.13(d)(2)(iv) requires that reasonableness factors 1, 2, and 3 listed below must collectively be achieved in order for a noise abatement measure to be deemed reasonable. Failure to achieve any of the three required reasonableness factors will result in the noise abatement measures being deemed not reasonable. In addition to the required reasonableness factors, optional reasonableness factors 4 through 8 listed below may be considered. However, no single optional reasonableness factor can be used to determine reasonableness.

1) The construction of a noise barrier is not reasonable unless a majority of residents and property owners of the benefited receptors (receptors that receive a noise reduction of 5 dBA or more from the noise barrier) want a noise barrier even if all other criteria indicate that a noise barrier is reasonable. During the environmental phase (NEPA process) of a project it will be assumed that the benefited receptors want a noise barrier. During the design phase of the project a public meeting will be held for residents and owners of benefited receptors. Local officials will also be invited and encouraged to attend this public meeting. After the public meeting a survey will be conducted to determine if the residents and owners of the benefited receptors want a noise barrier. Local officials will be encouraged to consider highway traffic noise in the land use planning process.

2) The construction of a noise barrier is not reasonable if the cost is more than $30,000 per benefited receptor. The barrier cost will include the cost of construction (material and labor), the cost of additional right-of-way, the additional cost of relocating utilities and any other costs associated with the barrier. The estimated cost of construction (material and labor) will be

$25 per square foot. The allowable cost per benefited receptor and the cost for construction shall be re-analyzed every 5 years. All receptors with noise reductions of 5 dBA or more will be counted. Each house or apartment unit will be counted as one receptor. Every 100 linear feet of frontage will be counted as one receptor when considering parks, active sports areas, campgrounds, cemeteries, and other similar outdoor noise sensitive land uses. For non-residential uses such as schools, places of worship, community centers and auditoriums the following equation will be used to determine the equivalent number of receptors:

Equivalent No. of Receptors = (no. of occupants/3) X (usage)
Usage = (no. of hours used per day/24) X (no. of days used per year/365)

3) Each barrier must reduce the noise level by at least 7 dBA at ten percent or more of the benefited receptors pursuant to 772 .13(d) (2) (iii).

4) The construction of a noise barrier is not reasonable if the impacted receptors were not constructed or the building permits were not issued before the date of public knowledge of the project. The date of public knowledge is the date the public is officially notified of the adoption of the location of a proposed highway project. This date is considered to be the date of approval of CEs, FONSIs, or RODs when considering highway traffic noise and highway traffic noise abatement.

5) The date of development of impacted receptors should be an important part of the determination of reasonableness. More consideration will be given to impacted receptors that predated initial highway construction.

6) More consideration will be given to impacted receptors with larger increases over existing noise levels. If the future build noise levels are at least 5 dBA greater than the existing noise levels more consideration will be given.

7) More consideration will be given to areas where larger changes in traffic noise levels are expected to occur if the project is constructed than if it is not.

8) More consideration will be given to benefited receptors with future build noise levels at or above the 23 CFR 772 Noise Abatement Criteria.

Following is a discussion of the existing conditions, predicted future conditions, and mitigation alternatives and recommendations.

IV. EXISTING NOISE ENVIRONMENT

IV. EXISTING NOISE ENVIRONMENT

A. SHORT-TERM NOISE MONITORING

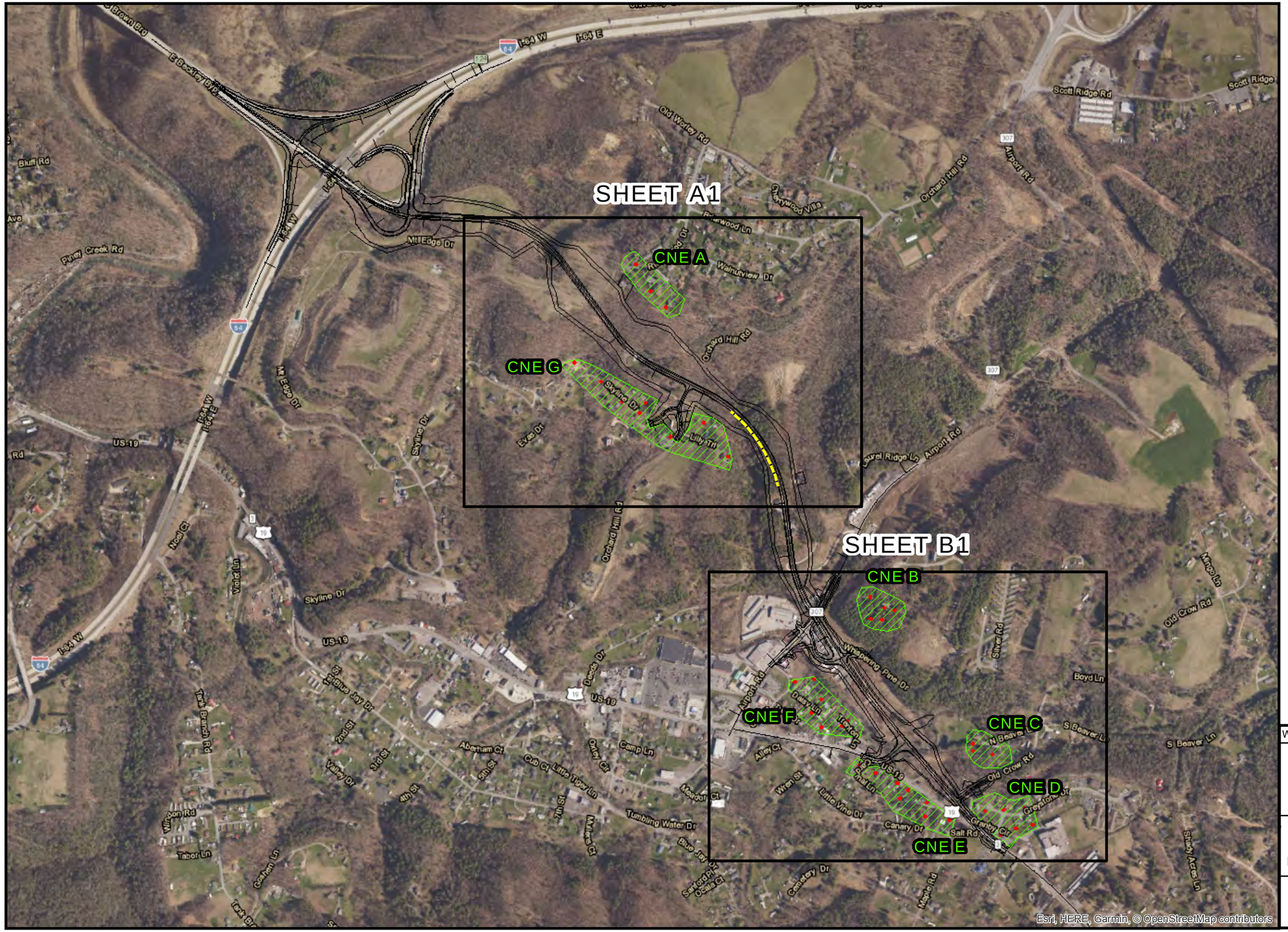
Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every CNE to validate the computer noise model. For areas where no dominant highway traffic noise source exists and modeling of existing worst-case noise conditions is not possible, short-term noise monitoring is used to determine the sound levels of the existing acoustic environment and provide a baseline in order to determine potential substantial noise increases.

Due to potential traffic congestion during A.M. and P.M. Peak Hour traffic periods, short-term noise measurements of 20 minutes in duration were obtained during off-peak traffic hours at eight locations on September 6, 2017. A summary of the short-term noise monitoring results is presented in Table IV-1. For each site, the table lists the site identification number, the location, and the measured sound level.

TABLE IV-1
SHORT-TERM NOISE MONITORING SUMMARY

CNE	SITE ID	SITE DESCRIPTION	MEASURED SOUND LEVEL (dBA)
A	A-03	504 Semore Court	43
B	B-01	Cabins at Pine Haven	49
D	D-01	103/105 Greystone Drive	61
E	E-02	1014 Ritter Drive	68
E	E-07	161 Canary Drive	61
F	F-07	138 Trenton Lane	53
G	G-03	558 Skyline Drive	50
G	G-06	473 Orchard Hill Road	44

The location of each noise monitoring site is presented on Figure 4, Sheets A1 and B1. Additional noise monitoring data (site sketches, meter printouts, and calibration certificates) are located in Appendices A through C. The measured sound levels in the study area ranged from 43 to 68 dBA.



Legend

- Common Noise Environment Boundary (CNE)
- Modeled Noise Receptor Site
- Noise Wall - Feasible, Not Reasonable

N

0 400 800 Feet

WEST VIRGINIA DIVISION OF HIGHWAYS

BEAVER TO
SOUTH EISENHOWER DRIVE
(BECKLEY Z-WAY)
RALEIGH COUNTY, WEST VIRGINIA

COMMON NOISE ENVIRONMENTS AND NOISE RECEPTOR LOCATIONS

FIGURE 4 - SHEET INDEX

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ENGINEERING - PLANNING

Legend

- Common Noise Environment Boundary (CNE)
- Modeled Noise Receptor Site
- Proposed Edge of Shoulder
- Noise Wall - Feasible, Not Reasonable

N

0 125 250 Feet

WEST VIRGINIA DIVISION OF HIGHWAYS

BEAVER TO
SOUTH EISENHOWER DRIVE
(BECKLEY Z-WAY)
RALEIGH COUNTY, WEST VIRGINIA

COMMON NOISE ENVIRONMENTS AND NOISE RECEPTOR LOCATIONS

FIGURE 4 - SHEET A1

SKELLY and LOY Inc.
CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

Legend

- Common Noise Environment Boundary (CNE)
- Modeled Noise Receptor Site
- Proposed Edge of Shoulder

N

0 125 250 Feet

WEST VIRGINIA DIVISION OF HIGHWAYS

BEAVER TO
SOUTH EISENHOWER DRIVE
(BECKLEY Z-WAY)
RALEIGH COUNTY, WEST VIRGINIA

COMMON NOISE ENVIRONMENTS AND NOISE RECEPTOR LOCATIONS

FIGURE 4 - SHEET B1

SKELLY and LOY Inc.
CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

For measurement sites within CNE A and CNE G, there was no dominant traffic noise source. I-64 traffic noise was barely audible at these measurement sites due to the distance and severe terrain features between the sites and I-64. The magnitude of I-64 traffic noise was not great enough to be easily distinguished from other environmental noise sources (birds, insect noise, etc.). Traffic noise from Airport Road (WV 307) was the dominant source of noise for the measurement location within CNE B. Traffic noise from Ritter Drive (U.S. Route 19) was the dominant source of noise for measurement locations within CNE D, CNE E, and CNE F. A noise measurement was not obtained within CNE C as this group of homes along North Beaver Lane was not included in the noise study area when the field work was conducted.

B. NOISE MODEL VALIDATION

Noise monitoring data are primarily utilized to validate the computer model used to predict existing and future levels. Upon measurement of the existing noise levels, a three-dimensional noise model of the existing roadway network was constructed which incorporates all significant terrain features that define the propagation path between the roadway and noise-sensitive receptors. Traffic volumes, composition, and speeds that were observed during the short-term monitoring periods were used as inputs to generate the validation models sound levels. A difference of ±3 dBA or less between the measured noise levels and the computer modeled noise levels is considered acceptable, as this is the limit of change detectable by the typical human ear. This computer model validation verifies that the sound propagation paths within the model are accurate and that the modeling techniques are correct and ensures that reported changes between the existing and future design year conditions are due to changes in traffic or propagation path as opposed to discrepancies between monitoring and modeling techniques.

The model validation was performed for the existing traffic conditions observed and recorded during the measurement period. As these noise measurements were not necessarily obtained during the existing loudest hour, the existing noise levels obtained during the 20-minute short-term monitoring session were not reported as the project's existing noise levels, with the exception of sites within CNE A and CNE G for which existing noise levels are not able to be modeled due to the absence of any dominant traffic noise source. Instead, the validated existing conditions TNM noise model was used to generate existing loudest-hour noise levels by using Peak Hour Volumes and truck percentages supplied by traffic engineers as model inputs.

A summary of the model validation is presented in Table IV-2. Five of the eight monitored locations were able to be accurately modeled within the acceptable ±3 dBA range. Due to the absence of a dominant traffic noise source for sites within CNE A and CNE G, model validation was not possible. For modeling locations adjacent to existing traffic noise sources, propagation paths were non-complex with relatively simple terrain features. Due to the relatively close proximity of the monitoring locations to Ritter Drive and the absence of other major noise sources, traffic noise was the most dominant component of the acoustic environment at these monitoring locations.

TABLE IV-2
NOISE MODEL VALIDATION

CNE	SITE ID	MEASURED NOISE LEVEL (DBA)	CALCULATED NOISE LEVEL (DBA)	DIFFERENCE (DBA)
A	A-03	43.2	NA	NA
B	B-01	48.9	46.0	-2.9
D	D-01	61.4	58.8	-2.6
E	E-02	67.9	67.0	-0.9
E	E-07	60.8	60.6	-0.2
F	F-07	53.4	53.8	0.4
G	G-03	50.4	NA	NA
G	G-06	44.2	NA	NA

C. COMMON NOISE ENVIRONMENT DETERMINATION

A common noise environment (CNE) is defined as a group of receptors that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. There are seven distinct geographic areas within the project area containing noise-sensitive land uses within 500 feet of the construction limits that can be considered similar in acoustical environment. Figure 4, Sheets A1 and B1, present each of the CNEs within the project area.

D. TRAFFIC DATA FOR NOISE PREDICTION

For calculation of the existing loudest-hour noise levels within each CNE, additional noise receptor locations are modeled to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-hour traffic data, existing and future traffic noise levels were predicted for the measurement sites and the additional receptor locations.

The traffic data used in the noise analysis must produce sound levels representative of the loudest hour of the day in the future design year. Traffic data were supplied by HDR as A.M. Peak Hour and P.M. Peak Hour volumes for both the Existing (2017) and the Design Year (2037) for all major roadways in the local network. Truck percentages and speed limits were provided for each roadway in the local network.

A comparison of the peak hour traffic data determined that overall traffic volumes for the P.M. Peak Hour were higher on average than for the A.M. Peak Hour for both 2017 Existing and 2037 Build conditions. Therefore, the P.M. Peak Hour volumes were chosen for the analysis.

E. EXISTING CONDITIONS

The discussion of existing conditions that follows, as well as the design year impact determination and mitigation consideration in the following section, will be discussed for each CNE.

1. CNE A

CNE A is located in the southwestern portion of the Cherry Hill neighborhood, approximately 2,000 feet southeast of I-64. It is comprised of four single-family residences (412 Ridgewood Drive, 500 Semore Court, 502 Semore Court, and 504 Semore Court). The residence at 415 Ridgewood Drive was originally included in CNE A but was removed from the study after being identified as a residential displacement due to the proposed highway alignment. An existing background noise level of 43 dBA was measured at 504 Semore Court (Receptor A-03) and is representative of background noise levels throughout this CNE. Due to severe terrain between this portion of the Cherry Hill neighborhood and I-64, highway traffic noise from I-64 is barely audible, with background noise comprised mostly of bird and insect noise with occasional contributions from random neighborhood events (children playing, barking dogs, yard

maintenance). Due to the absence of I-64 traffic noise of any considerable magnitude, existing noise levels were unable to be modeled within CNE A.

2. CNE B

CNE B consists of five rental cabins in the lower southern half of the Cabins at Pine Haven, located east of Airport Road (WV 307), along Whispering Pine Drive. These cabins are located on a bluff approximately 120 feet in elevation above the grade of Airport Road, which is the dominant source of traffic noise within this CNE. A traffic noise level of 49 dBA was measured at a cabin named "Honey in the Rock" (Receptor B-01). Existing traffic noise levels were modeled between 46 and 52 dBA. In addition to Airport Road traffic noise, other background noise sources (such as birds and insects) are also components of the acoustic environment within CNE B.

3. CNE C

CNE C consists of three single-family residences along North Beaver Lane (131 North Beaver Lane, 150 North Beaver Lane, and another residence with an unknown address). These properties are located approximately 450 feet northeast of Ritter Drive (U.S. Route 19), which is the dominant source of traffic noise within this CNE. Although no traffic noise levels were measured within CNE C, these receptors are close enough to Ritter Drive such that existing traffic noise levels were able to be modeled and range between 42 and 44 dBA.

4. CNE D

CNE D is located in the southeastern portion of the study area, adjacent to the north-bound lanes of Ritter Drive (U.S. Route 19), and is comprised of eight single-family residences along the western end of Greystone Drive (103, 105, 111, 113, 114, 115, 116, and 117 Greystone Drive and the Grace Baptist Church). A traffic noise level of 61 dBA was measured at 103/105 Greystone Drive (Receptor D-01). Existing traffic noise levels were modeled between 45 and 63 dBA. Ritter Drive is the dominant source of traffic noise within CNE D and is the overall dominant component of the existing acoustic environment.

5. CNE E

CNE E is located in the southeastern portion of the study area, immediately adjacent to the southbound lanes of Ritter Drive (U.S. Route 19), and is comprised of nine single-family residences along Cardinal Lane, Ritter Drive, Little Vine Drive, and Canary Drive (112 Cardinal Lane; 1014, 1020, and 1044 Ritter Drive; 327, 335, and 337 Little Vine Drive; and 161 and 169 Canary Drive). Ritter Drive is the dominant source of traffic noise within CNE E and is the overall dominant component of the existing acoustic environment. A traffic noise level of 68 dBA was measured at 1014 Ritter Drive (Receptor E-02), and a traffic noise level of 61 dBA was measured at 161 Canary Drive (Receptor E-07). Traffic noise levels within CNE E currently exceed the FHWA/WVDOH NAC of 66 dBA, with existing traffic noise levels modeled between 52 and 68 dBA.

6. CNE F

CNE F is located in the northeastern quadrant of the Ritter Drive (U.S. Route 19)/Airport Road (WV 307) intersection and is comprised of 15 single-family residences along Daisy Lane, Emma Court, Tulip Drive, Trenton Lane and Ritter Drive (101, 109, 115, 118, 119, and 127 Daisy Lane; 105, 108, and 111 Emma Court; 119 and 123 Tulip Drive; 131, 138, and 141 Trenton Lane; and 945 Ritter Drive). Ritter Drive and Airport Road are the two major sources of traffic noise within CNE F, with either one becoming the more dominant component of the existing acoustic environment depending on the location within CNE F. Several commercial properties (including McDonald's, City National Bank, Subway restaurant, Tri County Trailers, Link's Penzoil auto garage, and Bo's Auto Sales) provide a buffer in the noise propagation path between CNE F and Ritter Drive and Airport Road. A traffic noise level of 53 dBA was measured at 138 Trenton Lane (Receptor F-07), with existing traffic noise levels modeled between 45 and 56 dBA.

7. CNE G

CNE G is located in the northwestern portion of the study area, approximately 2,500 feet southeast of I-64. It is comprised of eight single-family residences along Skyline Drive, Orchard Hill Road, and Lilly Trail (521, 550, 558, 573, and 576 Skyline Drive; 473 Orchard Hill Road; and 111 and 150 Lilly Trail). An existing background noise level of 50 dBA was measured at 558 Skyline Drive (Receptor G-03), and an existing background noise level of 44 dBA was

measured at 473 Orchard Hill Road (Receptor G-06). These measurements are representative of the range of background noise levels throughout this CNE. Due to severe terrain between these properties and I-64, highway traffic noise from I-64 is barely audible, with background noise comprised mostly of bird and insect noise with occasional contributions from random neighborhood events (children playing, barking dogs, yard maintenance). Due to the absence of I-64 traffic noise of any considerable magnitude, existing noise levels were unable to be modeled within CNE G.

V. DESIGN YEAR CONDITIONS

V. DESIGN YEAR CONDITIONS

For the design year (2037) No-Build condition, the acoustical environment is expected to remain the same as the existing noise environment, with a potential for traffic noise levels to decrease due to reduced traffic volumes. Traffic data analyzed by the Fayette-Raleigh Metropolitan Planning Organization (FRMPO) Travel Demand Model (TDM) which compared Base Year 2015 to Future Year 2040 socio-economic (SE) datasets determined a majority of the roadway network southeast of I-64 showed declines in traffic volumes in 2040 compared to the 2015 base year volumes. This was due to projected declines in regional population and housing between the base year and future 2040 scenario. This traffic analysis determined that the base year SE data should be used to estimate a "worst-case" scenario.

For the design year (2037) Build condition, the future design year model was constructed based on preliminary design engineering plans and projected design year (2037) traffic figures. The proposed design consists of the construction of a new roadway from U.S. Route 19 and WV 307 (Airport Road) to I-64 at the South Eisenhower Drive interchange. A three-lane configuration will allow for northbound and southbound traffic lanes while maintaining a continuous turning lane for the length of the project. The continuous turn lane allows for safe turns to access local property. A connector road between the Z-Way and WV 307 will be constructed immediately southwest of this WV 307 overpass. A direct connector road will also be provided near the intersection of County Routes 9/8 (Skyline Drive) and 9/9 (Orchard Hill Road). The design speed will be 45 miles per hour.

Along with the proposed highway design, future terrain features were incorporated into this model to ensure the most accurate noise propagation paths possible. Predicted noise levels for both the existing year and the 2037 build scenario are presented in Table V-1. Impact determination for the design year is discussed below for each NSA.

TABLE V-1
DESIGN YEAR NOISE LEVELS

COMMON NOISE ENVIRONMENT	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)	2017 P.M. PEAK HOUR MODELED NOISE LEVEL	2037 P.M. PEAK HOUR MODELED NOISE LEVEL
CNE A	A-01	B	58	43*	39
	A-02	B	58	43*	41
	A-03	B	58	43*	42

TABLE V-1
(CONTINUED)

COMMON NOISE ENVIRONMENT	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)	2017 P.M. PEAK HOUR MODELED NOISE LEVEL	2037 P.M. PEAK HOUR MODELED NOISE LEVEL
CNE B	B-01	C	61	46	54
	B-02	C	63	48	53
	B-03	C	61	46	52
	B-04	C	66	52	61
	B-05	C	65	50	58
CNE C	C-01	B	59	44	54
	C-02	B	59	44	55
	C-03	B	57	42	52
CNE D	D-01	B	66	56	60
	D-02	B	66	52	54
	D-03	B	60	45	51
	D-04	B	66	52	53
	D-05	B	65	50	50
	D-06	C	66	63	64
CNE E	E-01	B	66	65	**66**
	E-02	B	66	65	64
	E-03	B	66	**68**	61
	E-04	B	66	55	54
	E-05	B	66	**68**	60
	E-06	B	66	**68**	61
	E-07	B	66	61	59
	E-08	B	66	**68**	64
CNE F	F-01	B	66	52	58
	F-02	B	61	46	60
	F-03	B	61	46	60
	F-04	B	66	51	56
	F-05	B	66	56	58
	F-06	B	63	48	58
	F-07	B	66	51	57

TABLE V-1
(CONTINUED)

COMMON NOISE ENVIRONMENT	RECEPTOR ID	ACTIVITY CATEGORY	NOISE ABATEMENT CRITERIA (DBA)	2017 P.M. PEAK HOUR MODELED NOISE LEVEL	2037 P.M. PEAK HOUR MODELED NOISE LEVEL
CNE G	G-01	B	65	50*	42
	G-02	B	65	50*	41
	G-03	B	65	50*	41
	G-04	B	65	50*	42
	G-05	B	65	50*	41
	G-06	B	59	44*	45
	G-07	B	59	44*	53
	G-08	B	59	44*	**61**

Red shade denotes impacted sound level

***** 2017 PM Peak Hour noise levels were not able to be modeled for CNE A and CNE G. 2017 measured noise levels are reported for these 11 receptor sites and used as a basis for determining substantial noise increase (> 15 dBA) impact criteria.

A. CNE A

Design year (2037) traffic noise levels are predicted to range between 39 and 42 dBA. As the existing sound levels within CNE A were measured to be 43 dBA, the NAC used to determine noise impacts is 58 dBA. Although traffic noise will be audible at the four residences within CNE A, the magnitude of the highway noise contribution to the overall acoustic environment will be minimal as these homes are elevated approximately 150 feet above the highway on average and approximately 400 feet away from the proposed edge of shoulder. The section of the proposed highway adjacent to CNE A is also in a nearly 100-foot cut for approximately 1,700 feet immediately southwest of CNE A. The proposed future grading, as well as the elevation of and distance from the highway, contributes to attenuating future traffic noise levels. As future traffic noise levels are not predicted to approach or exceed the NAC, noise abatement consideration is not warranted for any receptors within CNE A.

B. CNE B

Design year (2037) traffic noise levels are predicted to range between 52 and 61 dBA. As the existing sound levels within CNE B were modeled to range from 46 to 52 dBA, the NAC

used to determine noise impacts ranges from 61 to 66 dBA, depending upon the receptor. Traffic noise levels are predicted to be elevated between 5 and 8 dBA above existing noise levels due to the construction of the new highway and Airport Road connector approximately 300 feet to the southwest of CNE B. As future traffic noise levels are not predicted to approach or exceed the NAC, noise abatement consideration is not warranted for any receptors within CNE B.

C. CNE C

Design year (2037) traffic noise levels are predicted to range between 52 and 55 dBA. As the existing sound levels within CNE C were modeled to range from 42 to 44 dBA, the NAC used to determine noise impacts ranges from 57 to 59 dBA, depending on the receptor. Traffic noise levels are predicted to be elevated 10 dBA above existing noise levels due to the construction of the new highway approximately 300 feet to the southwest of CNE C. As future traffic noise levels are not predicted to approach or exceed the NAC, noise abatement consideration is not warranted for any receptors within CNE C.

D. CNE D

Design year (2037) traffic noise levels are predicted to range between 50 and 64 dBA. As the existing sound levels within CNE D were modeled to range from 45 to 63 dBA, the NAC used to determine noise impacts ranges from 60 to 66 dBA, depending upon the receptor. Traffic noise levels are predicted to be elevated between 1 and 6 dBA above existing noise levels due to the construction of the new highway immediately adjacent to CNE D. As future traffic noise levels are not predicted to approach or exceed the NAC, noise abatement consideration is not warranted for any receptors within CNE D.

E. CNE E

Design year (2037) traffic noise levels are predicted to range between 54 and 66 dBA. As the existing sound levels within CNE E were modeled to range from 55 to 68 dBA, the NAC used to determine noise impacts is 66 dBA for all receptors. Traffic noise levels are predicted to decrease between 1 and 8 dBA for Receptors E-02 through E-08 due the relocation of traffic farther away to the northeast along the new alignment. The future noise level at Receptor E-01 is predicted to be elevated by 1 dBA to 66 dBA, which approaches the NAC. This increase in

traffic noise is due to the construction of the new intersection connecting the new highway to existing Ritter Drive immediately adjacent to this property. As future traffic noise levels are predicted to approach the NAC for Receptor E-01, noise abatement consideration is warranted for this receptor.

F. CNE F

Design year (2037) traffic noise levels are predicted to range between 56 and 60 dBA. As the existing sound levels within CNE F were modeled to range from 46 to 56 dBA, the NAC used to determine noise impacts ranges from 61 to 66 dBA, depending upon the receptor. Traffic noise levels are predicted to be elevated between 1 and 14 dBA above existing noise levels due to the construction of the new highway and Airport Road connector approximately 200 feet to the northeast. As future traffic noise levels are not predicted to approach or exceed the NAC, noise abatement consideration is not warranted for any receptors within CNE F.

G. CNE G

Design year (2037) traffic noise levels are predicted to range between 41 and 61 dBA. As the existing sound levels within CNE G were measured to be between 44 and 50 dBA, the NAC used to determine noise impacts ranges from 59 to 65 dBA. Although traffic noise will be audible at Receptors G-01 through G-05, the magnitude of the highway noise contribution to the overall acoustic environment will be minimal as the highway is depressed in a substantial cut for the section of the alignment adjacent to these receptors. Future traffic noise levels are predicted to be elevated above the existing noise levels for Receptors G-06 through G-08, with a 17 dBA increase predicted for Receptor G-08. These elevated noise levels in the eastern half of CNE G are due to the highway's depression becoming less substantial with a much less significant cut as well as the introduction of the connector road for County Routes 9/8 (Skyline Drive) and 9/9 (Orchard Hill Road). As future traffic noise levels are predicted to exceed the NAC for Receptor G-08, noise abatement consideration is warranted for this receptor.

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

VI. MITIGATION ALTERNATIVES AND CONSIDERATION

Based on the impact evaluation discussed in the preceding section, noise abatement consideration is warranted for two of the seven CNEs analyzed in the noise analysis. State and federal guidelines suggest a range of mitigation measures which should be considered if noise impacts are expected to occur as the result of a transportation improvement project. Although noise barriers or berms are the most common noise mitigation measures, other approaches can be effective under certain circumstances. Traffic management measures, alteration of horizontal or vertical alignments, acquisition of property to serve as a buffer zone, or sound-proofing for Activity Category D receptors are several examples of alternative abatement measures that may be implemented. For the two noise-impacted properties identified in this noise analysis, these alternative abatement considerations are not feasible or practical.

For the noise-impacted property within CNE E (112 Cardinal Lane, represented by Receptor E-01), construction of a noise barrier or an earthen berm is not feasible as the placement of an effective noise barrier or berm is precluded due to the presence of Cardinal Lane. Based on the distance of the noise-sensitive land use away from the noise source, which is approximately 100 feet, the required noise barrier length to provide effective noise abatement would need to be approximately 800 feet, based on a noise barrier length rule-of-thumb presented in FHWA's Noise Barrier Design Handbook. With approximately only 300 linear feet available west of Cardinal Lane, a noise barrier cannot be constructed that would provide the required 5 dBA noise reduction to be considered feasible.

A noise barrier was evaluated for the noise-impacted property within CNE G (150 Lilly Trail, represented by Receptor G-08) to determine noise abatement feasibility and reasonableness. An optimized 780-foot-long, 14.25-foot-tall noise barrier evaluated along the southbound edge of shoulder from Station 339+00 to Station 331+00 provides the required noise reduction of ≥5 dBA at the one noise-impacted residence (see Table VI-1). This barrier does not provide acoustic benefit for any other residences. The approximate cost of this 11,110 ft^2 noise barrier is $277,750, based on a WVDOH estimated cost of construction of $25 per square foot. As this cost exceeds the allowable cost of $30,000 per benefited receptor, this noise barrier has been determined to be not reasonable.

TABLE VI-1
CNE G NOISE BARRIER DATA

COMMON NOISE ENVIRONMENT	RECEPTOR ID	RESIDENTIAL UNITS REPRESENTED	2037 BUILD SOUND LEVEL (WITHOUT BARRIER) (DBA)	2037 BUILD SOUND LEVEL (WITH BARRIER) (DBA)	INSERTION LOSS FROM OPTIMIZED BARRIER (DBA)
CNE G	G-01	1	42	41	1
	G-02	1	41	41	0
	G-03	1	41	40	1
	G-04	1	42	40	2
	G-05	1	41	40	1
	G-06	1	45	43	2
	G-07	1	53	52	1
	G-08	1	**61**	56	5

AVERAGE HEIGHT (FT)	LENGTH (FT)	SQUARE FEET	NOISE BARRIER COST (@ $25/FT^2)	TOTAL BENEFITS	COST PER BENEFIT	FEASIBLE?/ REASONABLE?
14.25	780	11,110	$277,750	1	$277,750	YES / NO

VII. CONSTRUCTION NOISE ABATEMENT

VII. CONSTRUCTION NOISE ABATEMENT

The following noise abatement measures may be incorporated into the contract plans and specifications in order to prevent adverse construction noise impact in the vicinity of the proposed project:

> *The contractor shall comply with all state and local sound control and noise level rules, regulations, and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on work related to the project shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without such muffler.*

VIII. COORDINATION WITH LOCAL OFFICIALS

VIII. COORDINATION WITH LOCAL OFFICIALS

The lack of consideration of highway traffic noise in land use planning and development at the local level has added to the highway traffic noise problem. Many developments now experiencing high noise levels were constructed adjacent to major highways long after these highways were proposed and constructed. This lack of concern for predictable high noise levels by local planning and zoning agencies and by developers has affected citizens and resulted in many noise complaints. Since WVDOH does not have any authority over land use planning and development, WVDOH can only encourage local officials and developers to consider highway traffic noise in the planning, zoning, and development of property near existing and proposed highways.

"Entering the Quiet Zone" is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. The following is a link to this brochure on FHWA's website: https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/index.cfm.

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures (such as noise barriers) in future years. There are five broad categories of such strategies:

- zoning,
- other legal restrictions (subdivision control, building codes, health codes),
- municipal ownership or control of the land,
- financial incentives for compatible development, and
- educational and advisory services.

"The Audible Landscape: A Manual for Highway and Land Use" is a well-written and comprehensive guide addressing these noise-compatible land use planning strategies, with significant detailed information. This document is available through FHWA's website, at https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/index.cfm.

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments and are often useful to local officials in corridors with undeveloped land. Highway traffic noise is considered a linear noise source, and sound levels can drop considerably over

distance. The degree that sound levels decrease can vary based on a number of different factors, including objects that shield the roadway noise, terrain features, building rows, and ground cover type (e.g., pavement, grass, or snow). The use of noise level contours has become increasingly popular over the last several years as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66 dBA noise contour for Category B and C land uses; the area within the 71 dBA noise contour for Category E land uses).

Upon evaluation of undeveloped lands that are adjacent to the proposed highway, it was determined through noise modeling that both the 66 dBA and 71 dBA noise contours are contained within the proposed right-of-way for the highway. Therefore, any future development within currently undeveloped lands will occur outside of the 66 dBA and 71 dBA noise contours.

IX. CONCLUSION

IX. CONCLUSION

A preliminary design noise analysis was conducted for the Beaver to South Eisenhower Drive Project (Beckley Z-Way) located in Raleigh County, West Virginia. The noise analysis involved the measurement of existing noise levels, modeling of existing (2017) and design year (2037) noise conditions, and design year noise impact assessment and noise abatement evaluations within the project study area.

Noise impacts for the design year (2037) conditions were identified within two of the seven CNEs. Due to the presence of side roads and driveways in the vicinity of the CNE E noise-impacted property, the necessary linear space to construct an effective noise barrier is not available. Although noise abatement consideration is warranted for this noise-impacted property, it was determined that noise abatement is not feasible.

A noise barrier to reduce elevated traffic noise levels at a noise impacted property within CNE G was evaluated to determine feasibility and reasonableness. Although this noise barrier was found to be feasible and provide the required 5 dBA of noise reduction, the cost per benefited receptor of this barrier exceeds the allowable $30,000 per benefited receptor reasonableness criteria.

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X. LIST OF PREPARERS AND REVIEWERS

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XI. APPENDICES

APPENDIX A -
SITE SKETCHES

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # A-03 **Description:** 504 Semore Court

MONITORING INFORMATION

Notes: traffic noise from I-64 barely audible at measurement location

Date: 9/6/2017
Start Time: 14:20:00
End Time: 14:40:00
Meter ID: db-3080 SN 3895
Response Rate: slow
no traffic noise source
Roadway:
Cars:
MT:
HT:

Time	Lav (dBA)	Time	Lav (dBA)
14:20:00	42.0	14:30:00	43.2
14:20:30	42.3	14:30:30	45.6
14:21:00	42.4	14:31:00	43.0
14:21:30	42.2	14:31:30	43.1
14:22:00	42.9	14:32:00	42.8
14:22:30	43.5	14:32:30	43.6
14:23:00	42.8	14:33:00	43.6
14:23:30	42.0	14:33:30	43.4
14:24:00	41.8	14:34:00	43.6
14:24:30	41.9	14:34:30	42.8
14:25:00	41.9	14:35:00	43.4
14:25:30	41.8	14:35:30	43.4
14:26:00	42.1	14:36:00	44.3
14:26:30	42.3	14:36:30	44.9
14:27:00	42.6	14:37:00	45.1
14:27:30	41.9	14:37:30	44.4
14:28:00	43.6	14:38:00	43.0
14:28:30	42.9	14:38:30	43.2
14:29:00	43.3	14:39:00	44.1
14:29:30	42.6	14:39:30	43.9
	Leq (dBA)		
	43.2		

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
no highway nearby	no highway nearby	soft	AJD, ERZ

Atmospheric Conditions :
mostly cloudy, 6 mph wind, 57° F

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # B-01 **Description:** Cabins at Pine Haven "Honey In The Rock"

MONITORING INFORMATION

Notes:

Date:	9/6/2017
Start Time:	16:40:00
End Time:	17:00:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
	Airport Road
Roadway:	EB / WB
Cars:	103 / 182
MT:	2 / 1
HT:	0 / 0
	45 mph

Time	Lav (dBA)	Time	Lav (dBA)
16:40:00	49.0	16:50:00	49.7
16:40:30	48.3	16:50:30	49.3
16:41:00	48.9	16:51:00	47.8
16:41:30	48.3	16:51:30	51.2
16:42:00	47.7	16:52:00	48.0
16:42:30	47.6	16:52:30	47.8
16:43:00	47.9	16:53:00	48.4
16:43:30	53.5	16:53:30	49.8
16:44:00	48.3	16:54:00	48.3
16:44:30	46.9	16:54:30	47.5
16:45:00	47.4	16:55:00	48.0
16:45:30	47.3	16:55:30	47.9
16:46:00	47.7	16:56:00	49.4
16:46:30	48.0	16:56:30	48.1
16:47:00	47.9	16:57:00	50.3
16:47:30	47.7	16:57:30	48.4
16:48:00	49.1	16:58:00	48.0
16:48:30	52.5	16:58:30	48.6
16:49:00	47.7	16:59:00	49.3
16:49:30	50.7	16:59:30	48.2
	Leq (dBA)		
	48.9		

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	approx. 120 ft above highway	soft	AJD, ERZ

Atmospheric Conditions :
mostly cloudy, 5 mph wind, 61° F

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # D-01 **Description:** 103/105 Greystone Drive

MONITORING INFORMATION

Notes: posted speed limit = 40 mph, actual observed speeds were 50 mph on average

Date:	9/7/2017
Start Time:	10:05:00
End Time:	10:25:00
Meter ID:	db-3080 SN 3897
Response Rate:	slow
Roadway:	Ritter Drive NB / SB
Cars:	166 / 194
MT:	7 / 11
HT:	8 / 8
	40 mph

Time	Lav (dBA)	Time	Lav (dBA)
10:05:00	56.2	10:15:00	58.1
10:05:30	59.7	10:15:30	61.5
10:06:00	60.4	10:16:00	57.5
10:06:30	57.9	10:16:30	58.8
10:07:00	60.9	10:17:00	55.6
10:07:30	60.5	10:17:30	56.9
10:08:00	54.3	10:18:00	59.4
10:08:30	58.3	10:18:30	57.9
10:09:00	61.7	10:19:00	66.1
10:09:30	55.6	10:19:30	60.5
10:10:00	61.7	10:20:00	71.4
10:10:30	59.9	10:20:30	64.0
10:11:00	60.6	10:21:00	59.0
10:11:30	60.4	10:21:30	58.7
10:12:00	58.9	10:22:00	52.6
10:12:30	61.8	10:22:30	57.4
10:13:00	64.4	10:23:00	62.0
10:13:30	58.8	10:23:30	61.4
10:14:00	55.1	10:24:00	63.6
10:14:30	58.8	10:24:30	57.3
	Leq (dBA)		
	61.4		

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	slightly above highway	soft	AJD, ERZ

Atmospheric Conditions :
overcast, 6 mph wind, 52° F

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # E-02 **Description:** 1014 Ritter Drive

MONITORING INFORMATION

Notes: posted speed limit = 40 mph, actual observed speeds were 50 mph on average

Date:	9/7/2017
Start Time:	10:05:00
End Time:	10:25:00
Meter ID:	db-3080 SN 3895
Response Rate:	slow
Roadway:	Ritter Drive NB / SB
Cars:	166 / 194
MT:	7 / 11
HT:	8 / 8
	40 mph

Time	Lav (dBA)	Time	Lav (dBA)
10:05:00	67.1	10:15:00	63.3
10:05:30	60.9	10:15:30	65.9
10:06:00	64.1	10:16:00	64.5
10:06:30	65.8	10:16:30	63.4
10:07:00	65.4	10:17:00	61.5
10:07:30	66.4	10:17:30	62.9
10:08:00	60.9	10:18:00	64.6
10:08:30	64.6	10:18:30	73.4
10:09:00	69.0	10:19:00	66.0
10:09:30	63.2	10:19:30	79.5
10:10:00	70.2	10:20:00	65.1
10:10:30	65.5	10:20:30	65.3
10:11:00	68.2	10:21:00	65.7
10:11:30	65.2	10:21:30	62.1
10:12:00	67.0	10:22:00	65.5
10:12:30	65.9	10:22:30	64.4
10:13:00	64.7	10:23:00	67.0
10:13:30	70.4	10:23:30	64.5
10:14:00	65.4	10:24:00	62.9
10:14:30	60.2	10:24:30	64.7
	Leq (dBA)		
	67.9		

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	at grade with highway	soft	AJD, ERZ

Atmospheric Conditions :
overcast, 6 mph wind, 52° F

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # E-07 **Description:** 161 Canary Drive

MONITORING INFORMATION

Notes: posted speed limit = 40 mph, actual observed speeds were 50 mph on average

Date:	9/7/2017
Start Time:	10:05:00
End Time:	10:25:00
Meter ID:	db-3080 SN 4618
Response Rate:	slow
Roadway:	Ritter Drive NB / SB
Cars:	166 / 194
MT:	7 / 11
HT:	8 / 8
	40 mph

Time	Lav (dBA)	Time	Lav (dBA)
10:05:00	56.6	10:15:00	58.9
10:05:30	57.4	10:15:30	59.8
10:06:00	58.3	10:16:00	57.0
10:06:30	57.9	10:16:30	57.5
10:07:00	58.4	10:17:00	55.5
10:07:30	58.4	10:17:30	57.9
10:08:00	54.8	10:18:00	59.9
10:08:30	58.2	10:18:30	59.9
10:09:00	60.9	10:19:00	64.9
10:09:30	56.9	10:19:30	67.7
10:10:00	61.8	10:20:00	70.2
10:10:30	58.4	10:20:30	59.5
10:11:00	59.0	10:21:00	58.4
10:11:30	59.4	10:21:30	59.1
10:12:00	59.4	10:22:00	55.9
10:12:30	59.4	10:22:30	58.6
10:13:00	63.0	10:23:00	60.8
10:13:30	58.7	10:23:30	61.6
10:14:00	58.9	10:24:00	57.9
10:14:30	57.0	10:24:30	57.0
	Leq (dBA)		
	60.8		

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	approx. 20 ft above highway	soft	AJD, ERZ

Atmospheric Conditions :
overcast, 6 mph wind, 52° F

Beckley Z-Way Noise Monitoring Site Sketch

Short-term Ambient Monitoring

Site # F-07 **Description:** 138 Trenton Lane

MONITORING INFORMATION

Notes: posted speed limit = 40 mph, actual observed speeds were 50 mph on average

Date:	9/7/2017
Start Time:	10:05:00
End Time:	10:25:00
Meter ID:	db-3080 SN 5093
Response Rate:	slow
Roadway:	Ritter Drive NB / SB
Cars:	166 / 194
MT:	7 / 11
HT:	8 / 8
	40 mph

Time	Lav (dBA)	Time	Lav (dBA)
10:05:00	52.4	10:15:00	52.0
10:05:30	49.8	10:15:30	52.5
10:06:00	50.0	10:16:00	52.6
10:06:30	51.4	10:16:30	53.1
10:07:00	50.7	10:17:00	50.2
10:07:30	51.2	10:17:30	51.7
10:08:00	49.2	10:18:00	51.8
10:08:30	51.4	10:18:30	56.5
10:09:00	51.5	10:19:00	53.9
10:09:30	49.3	10:19:30	62.7
10:10:00	50.9	10:20:00	53.6
10:10:30	54.7	10:20:30	53.4
10:11:00	53.5	10:21:00	52.7
10:11:30	53.3	10:21:30	49.8
10:12:00	51.4	10:22:00	51.3
10:12:30	50.9	10:22:30	52.4
10:13:00	50.6	10:23:00	53.3
10:13:30	58.0	10:23:30	52.0
10:14:00	51.8	10:24:00	49.7
10:14:30	53.0	10:24:30	50.6
	Leq (dBA)		
	53.4		

SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
asphalt	approx. 15 ft below highway	soft	AJD, ERZ

Atmospheric Conditions :
overcast, 6 mph wind, 52° F

Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # G-03 **Description:** 558 Skyline Drive

MONITORING INFORMATION

Notes: traffic noise from I-64 barely audible at measurement location

Date: 9/6/2017
Start Time: 15:40:00
End Time: 16:00:00
Meter ID: db-3080 SN 3895
Response Rate: slow
no traffic noise source
Roadway:
Cars:
MT:
HT:

Time	Lav (dBA)	Time	Lav (dBA)
15:40:00	48.2	15:50:00	47.5
15:40:30	48.2	15:50:30	49.2
15:41:00	48.5	15:51:00	53.1
15:41:30	49.2	15:51:30	50.6
15:42:00	49.5	15:52:00	44.6
15:42:30	49.3	15:52:30	49.9
15:43:00	49.5	15:53:00	46.7
15:43:30	56.6	15:53:30	46.0
15:44:00	48.9	15:54:00	47.0
15:44:30	48.6	15:54:30	49.9
15:45:00	48.5	15:55:00	58.2
15:45:30	49.4	15:55:30	47.2
15:46:00	49.0	15:56:00	48.0
15:46:30	49.2	15:56:30	44.8
15:47:00	48.9	15:57:00	49.6
15:47:30	49.0	15:57:30	50.6
15:48:00	48.7	15:58:00	56.6
15:48:30	50.2	15:58:30	45.8
15:49:00	47.4	15:59:00	47.4
15:49:30	47.3	15:59:30	49.7
	Leq (dBA)		
	50.4		

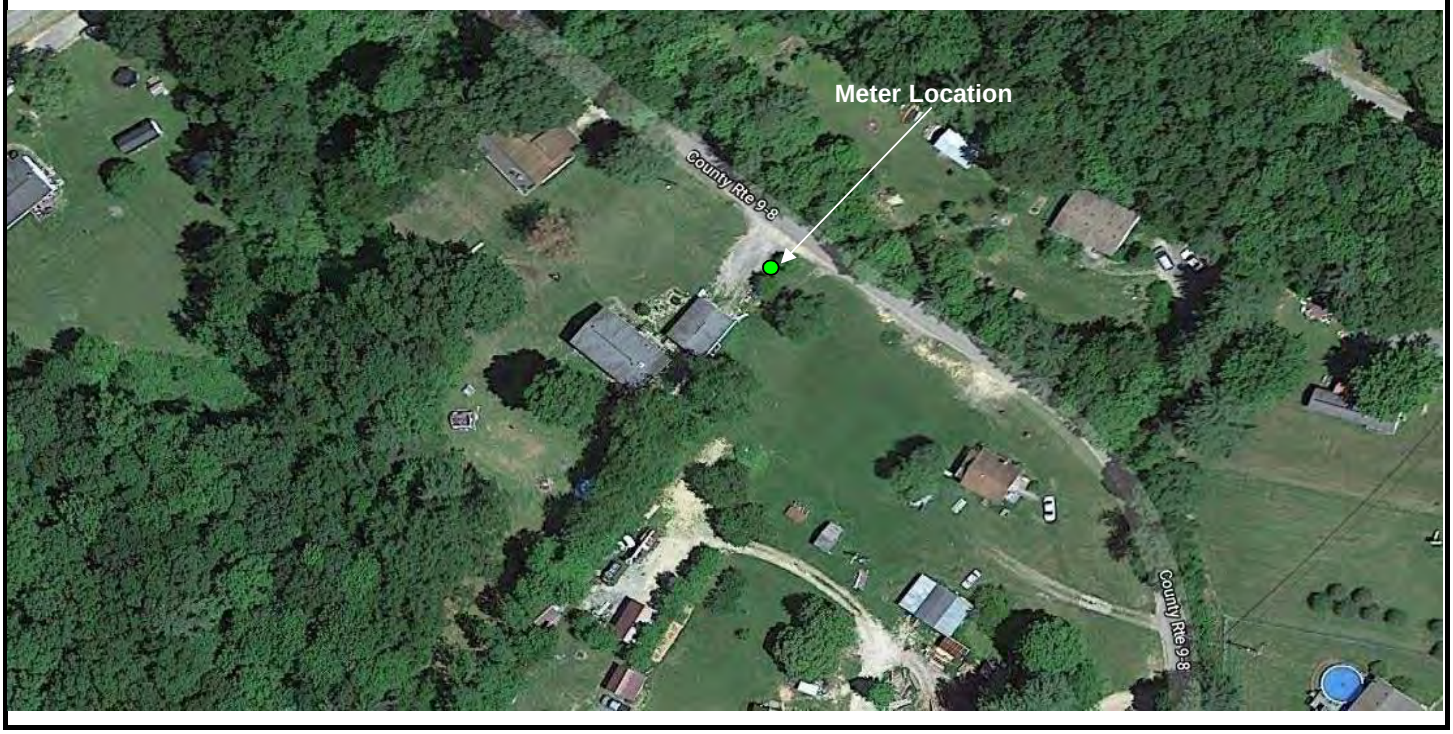
SITE SKETCH:

North Arrow ↑

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
no highway nearby	no highway nearby	soft	AJD, ERZ

Atmospheric Conditions :
mostly cloudy, 3 mph wind, 62° F



Beckley Z-Way Noise Monitoring Site Sketch
Short-term Ambient Monitoring

Site # G-06 **Description:** 473 Orchard Hill Rd

MONITORING INFORMATION

Notes: traffic noise from I-64 barely audible at measurement location

Date: 9/6/2017
Start Time: 15:40:00
End Time: 16:00:00
Meter ID: db-3080 SN 3897
Response Rate: slow
no traffic noise source
Roadway:
Cars:
MT:
HT:

Time	Lav (dBA)	Time	Lav (dBA)
15:40:00	41.8	15:50:00	46.5
15:40:30	41.4	15:50:30	42.1
15:41:00	44.0	15:51:00	42.4
15:41:30	45.5	15:51:30	41.8
15:42:00	45.7	15:52:00	41.5
15:42:30	50.4	15:52:30	42.1
15:43:00	41.9	15:53:00	41.9
15:43:30	45.3	15:53:30	41.7
15:44:00	42.3	15:54:00	42.1
15:44:30	42.5	15:54:30	42.2
15:45:00	41.5	15:55:00	44.4
15:45:30	43.0	15:55:30	42.7
15:46:00	42.8	15:56:00	42.2
15:46:30	42.9	15:56:30	42.4
15:47:00	43.8	15:57:00	41.7
15:47:30	44.1	15:57:30	43.0
15:48:00	46.7	15:58:00	48.3
15:48:30	44.0	15:58:30	48.6
15:49:00	41.6	15:59:00	46.7
15:49:30	41.9	15:59:30	42.0
	Leq (dBA)		
	44.2		

SITE SKETCH:

North Arrow

Site Specifics

Pavement Type:	Grade:	Site Surface:	Employee:
no highway nearby	no highway nearby	soft	AJD, ERZ

Atmospheric Conditions :
mostly cloudy, 3 mph wind, 62° F

APPENDIX B -
NOISE METER PRINTOUTS

```
**********************************************************************
Filename..............TMS1-1
Test Location..........504 Semore Court
Employee Name..........AJD ERZ
Employee Number........
Department.............ENV
          short-term noise measurem
          ents of existing ambient
          noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 3895
REPORT PRINTED ON 09/06/17 at 21:02:06

User ID: _____________________________




LOGGING STARTED......09/06/17 at 13:41:00
TOTAL LOGGING TIME...0 DAYS 01:11:28
LOGGING STOPPED......09/06/17 at 14:52:28
TOTAL INTERVALS......143
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/06/17 AT 13:16:36
PRE-TEST CALIBRATION RANGE...39.2 TO 139.2 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS................. 80dB  90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  44.6dB
Lav ( 80).......  39.2dB
Lav ( 90).......  39.2dB
SEL.............  80.8dB

TWA.............  39.2dB
TWA ( 80).......  39.2dB
TWA ( 90).......  39.2dB

Lmax............  59.4dB  09/06/17 at 13:53:57
Lpk.............UNDER RANGE
TIME OVER 115dB...00:00:00.00
```

DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/06/17					
13:41:00	42.9	44.9	UNDER	43.2	42.2
13:41:30	42.9	46.5	UNDER	44.2	41.2
13:42:00	42.2	43.3	UNDER	42.2	41.2
13:42:30	42.2	43.6	UNDER	42.2	41.2
13:43:00	42.0	43.8	UNDER	42.2	41.2
13:43:30	41.8	42.5	UNDER	42.2	41.2
13:44:00	42.2	42.9	UNDER	42.2	41.2
13:44:30	43.1	44.5	UNDER	43.2	42.2
13:45:00	43.8	45.7	UNDER	44.2	42.2
13:45:30	42.1	43.3	UNDER	42.2	41.2
13:46:00	42.2	42.6	UNDER	42.2	41.2
13:46:30	42.2	42.9	UNDER	42.2	41.2
13:47:00	42.2	42.9	UNDER	42.2	41.2
13:47:30	43.9	48.5	UNDER	47.2	41.2
13:48:00	42.4	43.2	UNDER	42.2	41.2
13:48:30	49.8	54.1	UNDER	52.2	42.2
13:49:00	50.5	55.1	UNDER	52.2	42.2
13:49:30	50.1	52.9	UNDER	51.2	46.2
13:50:00	45.5	51.5	UNDER	49.2	42.2
13:50:30	42.5	42.9	UNDER	42.2	42.2
13:51:00	42.6	43.9	UNDER	43.2	41.2
13:51:30	42.3	43.3	UNDER	42.2	41.2
13:52:00	42.0	42.9	UNDER	42.2	41.2
13:52:30	44.0	48.5	UNDER	47.2	41.2
13:53:00	42.2	44.9	UNDER	43.2	41.2
13:53:30	53.9	59.4	UNDER	56.2	43.2
13:54:00	43.8	52.9	UNDER	44.2	42.2
13:54:30	42.2	43.7	UNDER	42.2	41.2
13:55:00	42.9	44.0	UNDER	43.2	42.2
13:55:30	42.4	44.5	UNDER	43.2	41.2
13:56:00	43.1	44.6	UNDER	43.2	41.2
13:56:30	42.3	44.9	UNDER	42.2	41.2
13:57:00	43.6	45.7	UNDER	44.2	42.2
13:57:30	42.9	44.1	UNDER	43.2	42.2
13:58:00	43.5	44.9	UNDER	44.2	42.2
13:58:30	42.9	44.5	UNDER	43.2	41.2
13:59:00	43.7	46.9	UNDER	45.2	42.2
13:59:30	43.3	45.3	UNDER	44.2	42.2
14:00:00	42.9	44.9	UNDER	44.2	41.2
14:00:30	42.9	44.6	UNDER	44.2	41.2
14:01:00	42.5	44.9	UNDER	44.2	40.2
14:01:30	43.0	45.3	UNDER	44.2	41.2
14:02:00	43.4	45.9	UNDER	44.2	42.2
14:02:30	41.8	43.6	UNDER	42.2	41.2
14:03:00	42.3	43.7	UNDER	42.2	41.2
14:03:30	41.8	42.5	UNDER	42.2	41.2
14:04:00	42.0	42.5	UNDER	42.2	41.2
14:04:30	42.3	43.0	UNDER	42.2	41.2
14:05:00	43.1	44.4	UNDER	43.2	42.2
14:05:30	43.0	43.8	UNDER	43.2	42.2
14:06:00	42.9	44.1	UNDER	43.2	42.2
14:06:30	42.5	43.7	UNDER	43.2	41.2

14:07:00	42.2	42.5	UNDER	42.2	41.2
14:07:30	42.0	42.9	UNDER	42.2	41.2
14:08:00	42.2	44.0	UNDER	42.2	41.2
14:08:30	41.8	42.5	UNDER	42.2	41.2
14:09:00	42.3	43.3	UNDER	42.2	41.2
14:09:30	42.2	43.3	UNDER	42.2	41.2
14:10:00	42.4	44.5	UNDER	42.2	41.2
14:10:30	42.2	43.4	UNDER	42.2	41.2
14:11:00	42.4	43.3	UNDER	43.2	41.2
14:11:30	42.2	43.7	UNDER	42.2	41.2
14:12:00	42.5	44.0	UNDER	43.2	41.2
14:12:30	42.9	44.1	UNDER	43.2	41.2
14:13:00	42.6	43.7	UNDER	43.2	41.2
14:13:30	47.6	49.7	UNDER	49.2	42.2
14:14:00	46.4	47.7	UNDER	46.2	46.2
14:14:30	46.3	46.9	UNDER	46.2	45.2
14:15:00	46.6	48.5	UNDER	46.2	46.2
14:15:30	47.2	48.5	UNDER	47.2	46.2
14:16:00	46.7	47.3	UNDER	47.2	46.2
14:16:30	46.3	46.9	UNDER	46.2	46.2
14:17:00	46.2	46.5	UNDER	46.2	45.2
14:17:30	46.7	47.2	UNDER	46.2	46.2
14:18:00	46.8	47.3	UNDER	47.2	46.2
14:18:30	46.9	48.1	UNDER	47.2	45.2
14:19:00	45.6	46.6	UNDER	46.2	42.2
14:19:30	42.0	42.5	UNDER	42.2	41.2
14:20:00	42.0	42.7	UNDER	42.2	41.2
14:20:30	42.3	43.3	UNDER	42.2	41.2
14:21:00	42.4	42.9	UNDER	42.2	41.2
14:21:30	42.2	42.9	UNDER	42.2	41.2
14:22:00	42.9	44.1	UNDER	43.2	42.2
14:22:30	43.5	44.7	UNDER	44.2	42.2
14:23:00	42.8	44.5	UNDER	43.2	41.2
14:23:30	42.0	43.3	UNDER	42.2	41.2
14:24:00	41.8	42.1	UNDER	42.2	41.2
14:24:30	41.9	42.5	UNDER	42.2	41.2
14:25:00	41.9	44.9	UNDER	42.2	40.2
14:25:30	41.8	44.5	UNDER	42.2	40.2
14:26:00	42.1	43.0	UNDER	42.2	41.2
14:26:30	42.3	43.8	UNDER	43.2	41.2
14:27:00	42.6	43.3	UNDER	43.2	41.2
14:27:30	41.9	44.1	UNDER	42.2	41.2
14:28:00	43.6	45.7	UNDER	44.2	41.2
14:28:30	42.9	45.3	UNDER	43.2	41.2
14:29:00	43.3	45.7	UNDER	44.2	42.2
14:29:30	42.6	43.6	UNDER	42.2	41.2
14:30:00	43.2	44.5	UNDER	44.2	42.2
14:30:30	45.6	47.8	UNDER	46.2	43.2
14:31:00	43.0	44.0	UNDER	43.2	42.2
14:31:30	43.1	44.4	UNDER	43.2	42.2
14:32:00	42.8	43.3	UNDER	43.2	42.2
14:32:30	43.6	44.6	UNDER	44.2	42.2
14:33:00	43.6	44.1	UNDER	43.2	42.2
14:33:30	43.4	44.1	UNDER	43.2	42.2
14:34:00	43.6	44.9	UNDER	44.2	42.2
14:34:30	42.8	43.7	UNDER	43.2	42.2
14:35:00	43.4	44.0	UNDER	43.2	42.2
14:35:30	43.4	44.1	UNDER	43.2	42.2
14:36:00	44.3	47.5	UNDER	44.2	43.2
14:36:30	44.9	48.9	UNDER	46.2	43.2
14:37:00	45.1	48.1	UNDER	46.2	42.2
14:37:30	44.4	46.9	UNDER	45.2	42.2
14:38:00	43.0	45.5	UNDER	43.2	42.2

14:38:30	43.2	44.1	UNDER	43.2	42.2
14:39:00	44.1	46.0	UNDER	45.2	43.2
14:39:30	43.9	44.5	UNDER	44.2	43.2
14:40:00	43.8	44.7	UNDER	44.2	42.2
14:40:30	43.4	44.5	UNDER	44.2	42.2
14:41:00	43.9	45.3	UNDER	44.2	43.2
14:41:30	44.1	44.5	UNDER	44.2	43.2
14:42:00	43.4	44.1	UNDER	43.2	42.2
14:42:30	47.7	50.2	UNDER	49.2	43.2
14:43:00	46.2	46.8	UNDER	46.2	45.2
14:43:30	46.9	48.5	UNDER	48.2	46.2
14:44:00	47.6	48.5	UNDER	48.2	46.2
14:44:30	47.4	48.0	UNDER	47.2	46.2
14:45:00	48.2	48.9	UNDER	48.2	46.2
14:45:30	47.7	48.2	UNDER	48.2	47.2
14:46:00	48.1	48.9	UNDER	48.2	47.2
14:46:30	47.7	48.5	UNDER	48.2	47.2
14:47:00	47.9	48.5	UNDER	48.2	47.2
14:47:30	47.2	48.1	UNDER	47.2	46.2
14:48:00	46.6	47.1	UNDER	46.2	46.2
14:48:30	46.6	46.9	UNDER	46.2	46.2
14:49:00	45.6	46.9	UNDER	46.2	42.2
14:49:30	42.9	43.7	UNDER	43.2	42.2
14:50:00	43.9	48.0	UNDER	46.2	42.2
14:50:30	44.7	47.4	UNDER	46.2	43.2
14:51:00	43.7	46.2	UNDER	45.2	42.2
14:51:30	43.5	45.6	UNDER	44.2	42.2
14:52:00	46.1	58.9	UNDER	46.2	42.2

```
**********************************************************************
Filename..............TMS3-2
Test Location.........Cabins at Pine Haven
Employee Name.........AJD ERZ
Employee Number........"Honey In The Rock"
Department............ENV
          short-term noise measurem
          ents of existing ambient
          noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17
**********************************************************************

METROSONICS db-3080  V1.20  SERIAL # 5093
REPORT PRINTED ON 09/06/17 at 21:38:40

User ID: _____________________________




LOGGING STARTED......09/06/17 at 16:34:00
TOTAL LOGGING TIME...0 DAYS 00:32:38
LOGGING STOPPED......09/06/17 at 17:06:38
TOTAL INTERVALS......66
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/06/17 AT 13:08:27
PRE-TEST CALIBRATION RANGE...40.6 TO 140.6 dB
POST-TEST CALIBRATION TIME...09/06/17 AT 18:42:39
POST-TEST CALIBRATION RANGE...40.6 TO 140.6
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS................. 80dB  90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  49.5dB
Lav ( 80)......  40.6dB
Lav ( 90)......  40.6dB
SEL.............  82.3dB

TWA.............  40.6dB
TWA ( 80)......  40.6dB
TWA ( 90)......  40.6dB

Lmax............  74.3dB  09/06/17 at 17:06:37
Lpk............UNDER RANGE
TIME OVER 115dB...00:00:00.00
```

DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/06/17					
16:34:00	52.0	54.9	UNDER	54.6	48.6
16:34:30	52.0	58.0	UNDER	53.6	48.6
16:35:00	50.6	56.8	UNDER	54.6	47.6
16:35:30	47.2	48.7	UNDER	48.6	46.6
16:36:00	48.4	50.5	UNDER	49.6	46.6
16:36:30	53.0	58.3	UNDER	56.6	49.6
16:37:00	52.5	58.8	UNDER	55.6	47.6
16:37:30	48.4	50.0	UNDER	49.6	47.6
16:38:00	48.6	50.1	UNDER	49.6	47.6
16:38:30	50.3	51.7	UNDER	51.6	48.6
16:39:00	48.4	50.1	UNDER	49.6	47.6
16:39:30	48.9	52.8	UNDER	50.6	47.6
16:40:00	49.0	50.8	UNDER	50.6	47.6
16:40:30	48.3	49.6	UNDER	49.6	47.6
16:41:00	48.9	50.0	UNDER	49.6	47.6
16:41:30	48.3	49.7	UNDER	49.6	47.6
16:42:00	47.7	48.9	UNDER	48.6	47.6
16:42:30	47.6	49.3	UNDER	48.6	46.6
16:43:00	47.9	49.4	UNDER	48.6	46.6
16:43:30	53.5	65.3	UNDER	55.6	46.6
16:44:00	48.3	53.7	UNDER	49.6	46.6
16:44:30	46.9	48.0	UNDER	47.6	46.6
16:45:00	47.4	48.6	UNDER	48.6	46.6
16:45:30	47.3	48.7	UNDER	48.6	46.6
16:46:00	47.7	48.7	UNDER	48.6	46.6
16:46:30	48.0	49.0	UNDER	48.6	46.6
16:47:00	47.9	49.2	UNDER	48.6	47.6
16:47:30	47.7	48.8	UNDER	48.6	46.6
16:48:00	49.1	51.8	UNDER	50.6	47.6
16:48:30	52.5	57.3	UNDER	55.6	48.6
16:49:00	47.7	49.6	UNDER	49.6	46.6
16:49:30	50.7	55.6	UNDER	54.6	47.6
16:50:00	49.7	50.3	UNDER	50.6	48.6
16:50:30	49.3	54.6	UNDER	51.6	47.6
16:51:00	47.8	49.5	UNDER	48.6	47.6
16:51:30	51.2	56.5	UNDER	54.6	47.6
16:52:00	48.0	50.5	UNDER	49.6	46.6
16:52:30	47.8	50.3	UNDER	48.6	46.6
16:53:00	48.4	51.0	UNDER	50.6	46.6
16:53:30	49.8	51.1	UNDER	50.6	48.6
16:54:00	48.3	49.2	UNDER	48.6	47.6
16:54:30	47.5	48.8	UNDER	48.6	46.6
16:55:00	48.0	50.8	UNDER	49.6	46.6
16:55:30	47.9	48.8	UNDER	48.6	46.6
16:56:00	49.4	54.4	UNDER	51.6	47.6
16:56:30	48.1	49.3	UNDER	48.6	46.6
16:57:00	50.3	53.8	UNDER	52.6	47.6
16:57:30	48.4	49.3	UNDER	48.6	47.6
16:58:00	48.0	50.4	UNDER	49.6	46.6
16:58:30	48.6	49.7	UNDER	49.6	48.6
16:59:00	49.3	50.6	UNDER	50.6	47.6

16:59:30	48.2	49.3	UNDER	48.6	47.6
17:00:00	48.6	49.4	UNDER	49.6	47.6
17:00:30	49.3	51.9	UNDER	50.6	47.6
17:01:00	48.1	49.2	UNDER	48.6	46.6
17:01:30	48.3	49.6	UNDER	49.6	46.6
17:02:00	48.5	50.0	UNDER	49.6	47.6
17:02:30	48.5	54.4	UNDER	49.6	46.6
17:03:00	48.1	50.9	UNDER	49.6	46.6
17:03:30	48.8	50.1	UNDER	49.6	47.6
17:04:00	49.0	54.0	UNDER	50.6	47.6
17:04:30	50.0	54.8	UNDER	51.6	48.6
17:05:00	50.1	54.5	UNDER	51.6	48.6
17:05:30	49.8	52.9	UNDER	51.6	47.6
17:06:00	50.8	55.6	UNDER	54.6	48.6
17:06:30	59.2	74.3	UNDER	64.6	50.6

****

Filename.....TMS4-3
Test Location.....103/105 Greystone Drive
Employee Name.....AJD ERZ
Employee Number.....
Department.....ENV
short-term noise measurem
ents of existing ambient
noise - Beckley Z-Way

Calibrator Type.....MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17

****

METROSONICS db-3080 V1.12 SERIAL # 3897
REPORT PRINTED ON 09/08/17 at 14:20:24

User ID: _____

LOGGING STARTED.....09/07/17 at 09:46:30
TOTAL LOGGING TIME...0 DAYS 00:54:38
LOGGING STOPPED.....09/07/17 at 10:41:08
TOTAL INTERVALS.....110
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....09/07/17 AT 08:37:10
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION TIME...09/08/17 AT 14:09:54
POST-TEST CALIBRATION RANGE...39.9 TO 139.9
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 60.1dB
Lav (80)..... 39.9dB
Lav (90)..... 39.9dB
SEL..... 95.1dB

TWA..... 50.7dB
TWA (80)..... 39.9dB
TWA (90)..... 39.9dB

Lmax..... 76.7dB 09/07/17 at 10:20:17
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/07/17					
09:46:30	54.9	60.3	UNDER	59.9	48.9
09:47:00	54.3	57.7	UNDER	56.9	50.9
09:47:30	56.3	60.8	UNDER	58.9	52.9
09:48:00	54.7	57.6	UNDER	56.9	50.9
09:48:30	54.7	58.0	UNDER	56.9	50.9
09:49:00	57.5	60.9	UNDER	59.9	50.9
09:49:30	62.9	71.7	UNDER	68.9	51.9
09:50:00	59.8	63.2	UNDER	61.9	56.9
09:50:30	58.2	61.2	UNDER	60.9	52.9
09:51:00	51.9	57.6	UNDER	55.9	47.9
09:51:30	56.3	61.2	UNDER	60.9	51.9
09:52:00	58.9	61.7	UNDER	60.9	55.9
09:52:30	56.7	61.2	UNDER	60.9	49.9
09:53:00	56.8	59.4	UNDER	58.9	54.9
09:53:30	56.1	58.4	UNDER	57.9	53.9
09:54:00	58.5	62.1	UNDER	61.9	51.9
09:54:30	56.2	58.8	UNDER	58.9	51.9
09:55:00	56.3	61.6	UNDER	60.9	48.9
09:55:30	56.8	59.2	UNDER	58.9	51.9
09:56:00	60.5	64.8	UNDER	62.9	57.9
09:56:30	58.1	60.4	UNDER	59.9	55.9
09:57:00	58.6	62.0	UNDER	60.9	54.9
09:57:30	60.0	65.1	UNDER	61.9	54.9
09:58:00	56.2	64.0	UNDER	61.9	50.9
09:58:30	63.8	69.8	UNDER	68.9	54.9
09:59:00	57.9	61.4	UNDER	61.9	48.9
09:59:30	55.6	57.8	UNDER	57.9	49.9
10:00:00	57.9	62.4	UNDER	61.9	54.9
10:00:30	59.3	61.6	UNDER	61.9	56.9
10:01:00	61.5	65.2	UNDER	64.9	58.9
10:01:30	61.0	63.9	UNDER	62.9	57.9
10:02:00	59.9	63.2	UNDER	62.9	55.9
10:02:30	63.4	69.1	UNDER	68.9	57.9
10:03:00	59.0	61.6	UNDER	60.9	56.9
10:03:30	59.0	64.4	UNDER	62.9	53.9
10:04:00	57.6	62.0	UNDER	61.9	49.9
10:04:30	60.3	63.1	UNDER	62.9	56.9
10:05:00	56.2	60.0	UNDER	59.9	45.9
10:05:30	59.7	66.2	UNDER	63.9	47.9
10:06:00	60.4	64.8	UNDER	63.9	54.9
10:06:30	57.9	60.5	UNDER	59.9	54.9
10:07:00	60.9	68.8	UNDER	62.9	57.9
10:07:30	60.5	64.2	UNDER	62.9	55.9
10:08:00	54.3	59.1	UNDER	57.9	46.9
10:08:30	58.3	61.6	UNDER	60.9	53.9
10:09:00	61.7	68.0	UNDER	66.9	56.9
10:09:30	55.6	60.0	UNDER	59.9	50.9
10:10:00	61.7	67.2	UNDER	65.9	56.9
10:10:30	59.9	63.6	UNDER	62.9	54.9
10:11:00	60.6	65.3	UNDER	63.9	58.9
10:11:30	60.4	63.5	UNDER	62.9	57.9

10:12:00	58.9	62.4	UNDER	61.9	53.9
10:12:30	61.8	64.8	UNDER	64.9	57.9
10:13:00	64.4	70.9	UNDER	68.9	54.9
10:13:30	58.8	64.0	UNDER	62.9	52.9
10:14:00	55.1	58.9	UNDER	57.9	50.9
10:14:30	58.8	64.2	UNDER	62.9	52.9
10:15:00	58.1	61.7	UNDER	59.9	53.9
10:15:30	61.5	66.4	UNDER	64.9	55.9
10:16:00	57.5	60.4	UNDER	59.9	55.9
10:16:30	58.8	61.6	UNDER	61.9	54.9
10:17:00	55.6	60.7	UNDER	59.9	48.9
10:17:30	56.9	60.1	UNDER	58.9	52.9
10:18:00	59.4	61.6	UNDER	60.9	56.9
10:18:30	57.9	61.5	UNDER	60.9	49.9
10:19:00	66.1	72.8	UNDER	71.9	52.9
10:19:30	60.5	64.1	UNDER	62.9	56.9
10:20:00	71.4	76.7	UNDER	76.9	59.9
10:20:30	64.0	70.4	UNDER	69.9	54.9
10:21:00	59.0	64.8	UNDER	61.9	53.9
10:21:30	58.7	63.2	UNDER	60.9	52.9
10:22:00	52.6	58.5	UNDER	56.9	46.9
10:22:30	57.4	60.3	UNDER	59.9	52.9
10:23:00	62.0	67.2	UNDER	65.9	54.9
10:23:30	61.4	66.0	UNDER	63.9	58.9
10:24:00	63.6	71.6	UNDER	69.9	56.9
10:24:30	57.3	60.2	UNDER	59.9	50.9
10:25:00	60.4	62.4	UNDER	61.9	55.9
10:25:30	54.0	58.4	UNDER	57.9	46.9
10:26:00	61.0	64.8	UNDER	63.9	58.9
10:26:30	60.7	64.6	UNDER	62.9	55.9
10:27:00	57.5	60.0	UNDER	59.9	52.9
10:27:30	59.1	64.4	UNDER	62.9	54.9
10:28:00	60.0	64.0	UNDER	62.9	55.9
10:28:30	64.1	70.8	UNDER	69.9	52.9
10:29:00	57.3	60.0	UNDER	59.9	50.9
10:29:30	62.0	67.6	UNDER	65.9	55.9
10:30:00	60.5	63.5	UNDER	62.9	57.9
10:30:30	59.3	62.0	UNDER	61.9	55.9
10:31:00	61.5	66.4	UNDER	65.9	54.9
10:31:30	57.7	61.6	UNDER	60.9	46.9
10:32:00	55.5	61.2	UNDER	59.9	45.9
10:32:30	59.1	62.8	UNDER	62.9	49.9
10:33:00	57.9	60.7	UNDER	60.9	52.9
10:33:30	57.0	60.4	UNDER	59.9	54.9
10:34:00	59.2	61.6	UNDER	60.9	56.9
10:34:30	55.4	59.0	UNDER	57.9	50.9
10:35:00	60.8	64.8	UNDER	62.9	56.9
10:35:30	59.5	62.0	UNDER	61.9	53.9
10:36:00	61.2	64.4	UNDER	63.9	58.9
10:36:30	58.5	63.2	UNDER	61.9	52.9
10:37:00	52.2	58.8	UNDER	56.9	46.9
10:37:30	56.0	58.8	UNDER	58.9	50.9
10:38:00	56.9	59.7	UNDER	58.9	54.9
10:38:30	57.4	63.2	UNDER	59.9	50.9
10:39:00	58.6	63.6	UNDER	60.9	53.9
10:39:30	58.9	61.6	UNDER	60.9	55.9
10:40:00	57.1	61.2	UNDER	60.9	52.9
10:40:30	60.1	62.8	UNDER	61.9	56.9
10:41:00	67.3	74.0	UNDER	72.9	54.9

****

Filename.............TMS4-1
Test Location.........1014 Ritter Drive
Employee Name.........AJD ERZ
Employee Number........
Department............ENV
short-term noise measurem
ents of existing ambient
noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17

****

METROSONICS db-3080 V1.12 SERIAL # 3895
REPORT PRINTED ON 09/08/17 at 14:20:07

User ID: _____

LOGGING STARTED......09/07/17 at 09:12:00
TOTAL LOGGING TIME...0 DAYS 01:32:13
LOGGING STOPPED......09/07/17 at 10:44:13
TOTAL INTERVALS......185
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/07/17 AT 08:36:03
PRE-TEST CALIBRATION RANGE...39.1 TO 139.1 dB
POST-TEST CALIBRATION TIME...09/08/17 AT 13:40:48
POST-TEST CALIBRATION RANGE...39.1 TO 139.1
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.................. 80dB 90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav............. 65.8dB
Lav (80)...... 58.4dB
Lav (90)...... 39.1dB
SEL............. 103.1dB

TWA............. 58.7dB
TWA (80)...... 51.3dB
TWA (90)...... 39.1dB

Lmax............ 87.6dB 09/07/17 at 10:19:52
Lpk............. 113.7dB 09/07/17 at 10:44:11
TIME OVER 115dB...00:00:00.00

DOSE (80)........ 0.01%
PROJ. DOSE (80).. 0.05%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/07/17					
09:12:00	63.3	67.7	UNDER	66.1	58.1
09:12:30	61.7	66.8	UNDER	64.1	55.1
09:13:00	59.4	66.8	UNDER	64.1	49.1
09:13:30	55.7	61.6	UNDER	60.1	46.1
09:14:00	63.4	66.4	UNDER	66.1	57.1
09:14:30	60.2	64.8	UNDER	62.1	51.1
09:15:00	64.6	70.7	UNDER	68.1	59.1
09:15:30	63.9	70.1	UNDER	67.1	58.1
09:16:00	60.9	69.6	UNDER	63.1	55.1
09:16:30	55.5	59.2	UNDER	57.1	52.1
09:17:00	73.5	81.7	UNDER	79.1	55.1
09:17:30	60.9	66.6	UNDER	64.1	53.1
09:18:00	58.9	65.3	UNDER	63.1	51.1
09:18:30	59.1	66.8	UNDER	63.1	46.1
09:19:00	66.1	73.6	UNDER	69.1	58.1
09:19:30	63.7	67.1	UNDER	64.1	61.1
09:20:00	62.3	65.2	UNDER	63.1	60.1
09:20:30	72.2	79.6	UNDER	77.1	62.1
09:21:00	63.0	68.8	UNDER	66.1	57.1
09:21:30	70.2	79.8	UNDER	74.1	59.1
09:22:00	62.2	65.3	UNDER	64.1	58.1
09:22:30	68.7	75.6	UNDER	73.1	60.1
09:23:00	65.2	72.5	UNDER	69.1	54.1
09:23:30	61.0	67.6	UNDER	64.1	54.1
09:24:00	58.4	67.3	UNDER	62.1	51.1
09:24:30	62.6	68.8	UNDER	68.1	52.1
09:25:00	65.7	73.8	UNDER	70.1	52.1
09:25:30	60.2	65.8	UNDER	63.1	52.1
09:26:00	57.1	65.6	UNDER	58.1	53.1
09:26:30	65.8	74.1	UNDER	71.1	53.1
09:27:00	64.6	72.9	UNDER	68.1	57.1
09:27:30	57.6	66.0	UNDER	61.1	50.1
09:28:00	66.1	70.8	UNDER	69.1	55.1
09:28:30	63.1	70.4	UNDER	65.1	56.1
09:29:00	66.2	72.0	UNDER	70.1	55.1
09:29:30	60.9	65.2	UNDER	64.1	54.1
09:30:00	68.9	73.6	UNDER	72.1	54.1
09:30:30	59.7	70.0	UNDER	62.1	52.1
09:31:00	60.3	66.8	UNDER	65.1	46.1
09:31:30	62.1	70.8	UNDER	67.1	46.1
09:32:00	56.2	62.4	UNDER	60.1	48.1
09:32:30	55.8	62.1	UNDER	61.1	45.1
09:33:00	70.6	78.4	UNDER	76.1	60.1
09:33:30	66.4	72.1	UNDER	70.1	60.1
09:34:00	61.8	64.8	UNDER	64.1	55.1
09:34:30	55.3	61.2	UNDER	59.1	46.1
09:35:00	62.8	68.1	UNDER	66.1	56.1
09:35:30	63.3	66.0	UNDER	65.1	60.1
09:36:00	67.9	73.2	UNDER	72.1	60.1
09:36:30	62.0	65.6	UNDER	63.1	59.1
09:37:00	63.4	67.1	UNDER	66.1	58.1

09:37:30	66.7	74.5	UNDER	72.1	58.1
09:38:00	60.4	65.3	UNDER	63.1	56.1
09:38:30	63.3	68.4	UNDER	65.1	57.1
09:39:00	61.7	67.2	UNDER	65.1	50.1
09:39:30	56.1	63.6	UNDER	59.1	50.1
09:40:00	62.1	67.0	UNDER	65.1	51.1
09:40:30	69.4	77.6	UNDER	74.1	60.1
09:41:00	51.7	62.1	UNDER	54.1	46.1
09:41:30	59.1	67.2	UNDER	64.1	46.1
09:42:00	61.8	66.0	UNDER	65.1	50.1
09:42:30	60.5	66.0	UNDER	63.1	56.1
09:43:00	61.9	69.4	UNDER	66.1	56.1
09:43:30	72.0	82.1	UNDER	77.1	58.1
09:44:00	66.4	71.2	UNDER	68.1	59.1
09:44:30	61.7	69.6	UNDER	67.1	47.1
09:45:00	56.2	66.8	UNDER	62.1	47.1
09:45:30	61.3	66.0	UNDER	63.1	56.1
09:46:00	60.7	67.2	UNDER	65.1	55.1
09:46:30	63.4	69.7	UNDER	67.1	55.1
09:47:00	63.3	72.2	UNDER	68.1	54.1
09:47:30	56.2	65.5	UNDER	60.1	48.1
09:48:00	60.9	66.8	UNDER	64.1	48.1
09:48:30	55.0	64.0	UNDER	59.1	47.1
09:49:00	59.5	66.4	UNDER	63.1	49.1
09:49:30	68.4	77.2	UNDER	74.1	50.1
09:50:00	64.4	69.4	UNDER	67.1	53.1
09:50:30	60.9	65.6	UNDER	64.1	53.1
09:51:00	61.4	65.2	UNDER	64.1	50.1
09:51:30	63.5	68.4	UNDER	66.1	53.1
09:52:00	61.7	69.2	UNDER	64.1	51.1
09:52:30	63.8	68.4	UNDER	66.1	57.1
09:53:00	64.9	68.8	UNDER	67.1	56.1
09:53:30	67.0	72.0	UNDER	69.1	62.1
09:54:00	65.5	72.0	UNDER	69.1	59.1
09:54:30	62.7	66.8	UNDER	64.1	59.1
09:55:00	63.3	70.4	UNDER	66.1	54.1
09:55:30	63.2	66.4	UNDER	65.1	54.1
09:56:00	64.7	68.0	UNDER	67.1	59.1
09:56:30	65.1	68.8	UNDER	68.1	53.1
09:57:00	65.7	69.3	UNDER	68.1	60.1
09:57:30	64.2	68.2	UNDER	67.1	52.1
09:58:00	65.5	71.6	UNDER	69.1	53.1
09:58:30	61.8	68.8	UNDER	67.1	48.1
09:59:00	71.0	77.4	UNDER	76.1	60.1
09:59:30	59.8	67.6	UNDER	64.1	47.1
10:00:00	59.2	68.8	UNDER	62.1	47.1
10:00:30	67.1	72.0	UNDER	71.1	59.1
10:01:00	68.0	72.8	UNDER	71.1	64.1
10:01:30	64.4	68.8	UNDER	67.1	56.1
10:02:00	65.9	71.3	UNDER	69.1	53.1
10:02:30	65.4	67.6	UNDER	67.1	59.1
10:03:00	68.6	75.2	UNDER	74.1	57.1
10:03:30	63.9	66.9	UNDER	65.1	56.1
10:04:00	63.9	68.7	UNDER	66.1	54.1
10:04:30	63.2	69.6	UNDER	66.1	55.1
10:05:00	67.1	70.0	UNDER	69.1	63.1
10:05:30	60.9	67.6	UNDER	64.1	48.1
10:06:00	64.1	67.9	UNDER	67.1	54.1
10:06:30	65.8	69.2	UNDER	68.1	58.1
10:07:00	65.4	70.8	UNDER	68.1	56.1
10:07:30	66.4	70.4	UNDER	67.1	60.1
10:08:00	60.9	64.8	UNDER	63.1	54.1
10:08:30	64.6	68.4	UNDER	66.1	54.1

10:09:00	69.0	77.3	UNDER	74.1	55.1
10:09:30	63.2	68.1	UNDER	66.1	51.1
10:10:00	70.2	78.0	UNDER	76.1	55.1
10:10:30	65.5	71.2	UNDER	68.1	59.1
10:11:00	68.2	73.3	UNDER	71.1	61.1
10:11:30	65.2	68.0	UNDER	67.1	61.1
10:12:00	67.0	71.2	UNDER	69.1	62.1
10:12:30	65.9	72.0	UNDER	70.1	54.1
10:13:00	64.7	73.6	UNDER	66.1	56.1
10:13:30	70.4	76.4	UNDER	75.1	51.1
10:14:00	65.4	71.6	UNDER	69.1	59.1
10:14:30	60.2	67.6	UNDER	63.1	51.1
10:15:00	63.3	68.4	UNDER	67.1	55.1
10:15:30	65.9	70.0	UNDER	68.1	59.1
10:16:00	64.5	68.8	UNDER	67.1	57.1
10:16:30	63.4	68.8	UNDER	67.1	53.1
10:17:00	61.5	66.0	UNDER	64.1	52.1
10:17:30	62.9	68.0	UNDER	66.1	55.1
10:18:00	64.6	68.6	UNDER	68.1	54.1
10:18:30	73.4	83.2	UNDER	79.1	63.1
10:19:00	66.0	78.0	UNDER	69.1	51.1
10:19:30	79.5	87.6	UNDER	85.1	61.1
10:20:00	65.1	70.0	UNDER	66.1	57.1
10:20:30	65.3	70.1	UNDER	68.1	59.1
10:21:00	65.7	72.8	UNDER	70.1	57.1
10:21:30	62.1	66.0	UNDER	65.1	52.1
10:22:00	65.5	72.4	UNDER	70.1	48.1
10:22:30	64.4	71.4	UNDER	68.1	48.1
10:23:00	67.0	72.0	UNDER	70.1	58.1
10:23:30	64.5	71.6	UNDER	68.1	54.1
10:24:00	62.9	67.0	UNDER	65.1	54.1
10:24:30	64.7	69.0	UNDER	67.1	57.1
10:25:00	63.8	66.8	UNDER	65.1	58.1
10:25:30	66.9	74.1	UNDER	70.1	59.1
10:26:00	65.2	69.6	UNDER	68.1	57.1
10:26:30	65.2	67.6	UNDER	67.1	59.1
10:27:00	65.1	69.6	UNDER	68.1	59.1
10:27:30	65.6	70.4	UNDER	68.1	55.1
10:28:00	63.9	70.4	UNDER	66.1	54.1
10:28:30	67.6	74.4	UNDER	72.1	51.1
10:29:00	64.5	68.0	UNDER	66.1	58.1
10:29:30	65.9	70.8	UNDER	69.1	57.1
10:30:00	64.9	69.2	UNDER	67.1	60.1
10:30:30	67.5	73.3	UNDER	72.1	62.1
10:31:00	66.3	69.6	UNDER	68.1	59.1
10:31:30	63.4	68.0	UNDER	66.1	56.1
10:32:00	64.6	72.0	UNDER	69.1	50.1
10:32:30	63.6	67.6	UNDER	65.1	57.1
10:33:00	61.5	67.6	UNDER	64.1	52.1
10:33:30	64.6	67.9	UNDER	66.1	61.1
10:34:00	64.3	68.0	UNDER	66.1	60.1
10:34:30	65.1	70.3	UNDER	67.1	59.1
10:35:00	66.2	71.8	UNDER	70.1	57.1
10:35:30	65.3	70.4	UNDER	68.1	54.1
10:36:00	65.9	68.5	UNDER	68.1	61.1
10:36:30	63.8	68.8	UNDER	67.1	58.1
10:37:00	62.4	68.4	UNDER	66.1	48.1
10:37:30	61.6	66.4	UNDER	64.1	51.1
10:38:00	62.5	66.3	UNDER	64.1	53.1
10:38:30	63.7	67.2	UNDER	66.1	55.1
10:39:00	64.1	68.4	UNDER	67.1	51.1
10:39:30	64.5	69.6	UNDER	67.1	57.1
10:40:00	64.8	69.6	UNDER	67.1	56.1

10:40:30	64.3	67.7	UNDER	66.1	56.1
10:41:00	61.0	65.7	UNDER	64.1	51.1
10:41:30	59.3	64.8	UNDER	62.1	49.1
10:42:00	66.9	71.0	UNDER	70.1	61.1
10:42:30	65.1	68.9	UNDER	67.1	60.1
10:43:00	66.0	70.6	UNDER	68.1	58.1
10:43:30	63.5	68.5	UNDER	66.1	55.1
10:44:00	76.3	87.0	113.7	82.1	60.1

****

Filename.....TMS4-6
Test Location.....161 Canary Drive
Employee Name.....AJD ERZ
Employee Number.....
Department.....ENV
short-term noise measurem
ents of existing ambient
noise - Beckley Z-Way

Calibrator Type.....MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17

****

METROSONICS db-3080 V1.20 SERIAL # 4618
REPORT PRINTED ON 09/08/17 at 14:20:32

User ID: _____

LOGGING STARTED.....09/07/17 at 10:02:30
TOTAL LOGGING TIME...0 DAYS 00:34:16
LOGGING STOPPED.....09/07/17 at 10:36:46
TOTAL INTERVALS.....69
INTERVAL LENGTH.....00:00:30

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....09/07/17 AT 08:37:34
PRE-TEST CALIBRATION RANGE...40.0 TO 140.0 dB
POST-TEST CALIBRATION TIME...09/08/17 AT 14:11:10
POST-TEST CALIBRATION RANGE...40.1 TO 140.1
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 60.3dB
Lav (80)..... 40.0dB
Lav (90)..... 40.0dB
SEL..... 93.3dB

TWA..... 48.9dB
TWA (80)..... 40.0dB
TWA (90)..... 40.0dB

Lmax..... 77.9dB 09/07/17 at 10:20:01
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/07/17					
10:02:30	61.8	68.2	UNDER	66.0	57.0
10:03:00	57.1	59.4	UNDER	58.0	53.0
10:03:30	56.4	58.1	UNDER	57.0	53.0
10:04:00	56.4	61.7	UNDER	59.0	53.0
10:04:30	58.2	60.3	UNDER	59.0	55.0
10:05:00	56.6	59.3	UNDER	58.0	51.0
10:05:30	57.4	59.9	UNDER	59.0	55.0
10:06:00	58.3	61.3	UNDER	60.0	54.0
10:06:30	57.9	59.7	UNDER	58.0	55.0
10:07:00	58.4	60.7	UNDER	60.0	53.0
10:07:30	58.4	61.0	UNDER	60.0	53.0
10:08:00	54.8	57.9	UNDER	56.0	52.0
10:08:30	58.2	60.5	UNDER	59.0	55.0
10:09:00	60.9	66.5	UNDER	65.0	53.0
10:09:30	56.9	60.0	UNDER	59.0	55.0
10:10:00	61.8	67.1	UNDER	65.0	57.0
10:10:30	58.4	61.9	UNDER	61.0	55.0
10:11:00	59.0	62.1	UNDER	61.0	55.0
10:11:30	59.4	61.9	UNDER	61.0	57.0
10:12:00	59.4	62.5	UNDER	61.0	55.0
10:12:30	59.4	60.7	UNDER	60.0	57.0
10:13:00	63.0	67.0	UNDER	65.0	56.0
10:13:30	58.7	62.1	UNDER	60.0	56.0
10:14:00	58.9	62.3	UNDER	61.0	55.0
10:14:30	57.0	61.3	UNDER	58.0	53.0
10:15:00	58.9	63.5	UNDER	59.0	56.0
10:15:30	59.8	63.8	UNDER	63.0	55.0
10:16:00	57.0	59.5	UNDER	58.0	55.0
10:16:30	57.5	59.3	UNDER	58.0	55.0
10:17:00	55.5	57.3	UNDER	56.0	54.0
10:17:30	57.9	60.7	UNDER	60.0	55.0
10:18:00	59.9	62.2	UNDER	61.0	56.0
10:18:30	59.9	64.1	UNDER	61.0	57.0
10:19:00	64.9	72.7	UNDER	70.0	57.0
10:19:30	67.7	77.9	UNDER	71.0	58.0
10:20:00	70.2	77.9	UNDER	76.0	57.0
10:20:30	59.5	62.3	UNDER	61.0	55.0
10:21:00	58.4	61.8	UNDER	61.0	55.0
10:21:30	59.1	64.1	UNDER	62.0	55.0
10:22:00	55.9	57.9	UNDER	56.0	53.0
10:22:30	58.6	60.7	UNDER	60.0	54.0
10:23:00	60.8	65.1	UNDER	63.0	57.0
10:23:30	61.6	69.3	UNDER	66.0	54.0
10:24:00	57.9	60.1	UNDER	59.0	56.0
10:24:30	57.0	59.9	UNDER	58.0	54.0
10:25:00	59.3	61.3	UNDER	60.0	55.0
10:25:30	58.0	60.9	UNDER	60.0	54.0
10:26:00	59.8	61.5	UNDER	60.0	57.0
10:26:30	59.5	62.1	UNDER	60.0	57.0
10:27:00	59.7	60.9	UNDER	60.0	58.0
10:27:30	58.8	60.8	UNDER	60.0	56.0

10:28:00	59.9	62.9	UNDER	61.0	56.0
10:28:30	61.4	67.2	UNDER	65.0	57.0
10:29:00	58.9	60.7	UNDER	59.0	57.0
10:29:30	62.1	65.8	UNDER	65.0	57.0
10:30:00	59.9	61.1	UNDER	60.0	58.0
10:30:30	60.8	65.6	UNDER	64.0	57.0
10:31:00	58.7	60.3	UNDER	59.0	56.0
10:31:30	57.2	60.6	UNDER	59.0	53.0
10:32:00	57.7	60.1	UNDER	59.0	55.0
10:32:30	57.7	60.7	UNDER	59.0	55.0
10:33:00	58.0	60.2	UNDER	59.0	54.0
10:33:30	58.0	60.3	UNDER	59.0	56.0
10:34:00	58.8	60.7	UNDER	59.0	57.0
10:34:30	58.6	60.7	UNDER	59.0	56.0
10:35:00	60.3	63.4	UNDER	62.0	57.0
10:35:30	59.5	61.4	UNDER	60.0	56.0
10:36:00	60.0	62.5	UNDER	62.0	57.0
10:36:30	61.5	72.9	UNDER	61.0	55.0

****

Filename.............TMS4-2
Test Location.........138 Trenton Lane
Employee Name.........AJD ERZ
Employee Number........
Department.............ENV
short-term noise measurem
ents of existing ambient
noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17

****

METROSONICS db-3080 V1.20 SERIAL # 5093
REPORT PRINTED ON 09/08/17 at 14:20:15

User ID: _____

LOGGING STARTED......09/07/17 at 09:28:00
TOTAL LOGGING TIME...0 DAYS 01:18:47
LOGGING STOPPED......09/07/17 at 10:46:47
TOTAL INTERVALS......158
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/07/17 AT 08:36:37
PRE-TEST CALIBRATION RANGE...40.6 TO 140.6 dB
POST-TEST CALIBRATION TIME...09/08/17 AT 13:50:34
POST-TEST CALIBRATION RANGE...40.6 TO 140.6
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS.................. 80dB 90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav............. 65.8dB
Lav (80)...... 65.4dB
Lav (90)...... 58.7dB
SEL............. 102.4dB

TWA............. 57.9dB
TWA (80)...... 57.6dB
TWA (90)...... 50.9dB

Lmax............ 93.0dB 09/07/17 at 09:44:58
Lpk............. 112.3dB 09/07/17 at 09:43:27
TIME OVER 115dB...00:00:00.00

DOSE (80)........ 0.05%
PROJ. DOSE (80).. 0.30%
DOSE (90)........ 0.01%
PROJ. DOSE (90).. 0.06%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/07/17					
09:28:00	52.4	56.4	UNDER	54.6	49.6
09:28:30	49.9	52.4	UNDER	50.6	48.6
09:29:00	49.9	52.4	UNDER	51.6	48.6
09:29:30	50.1	58.2	UNDER	51.6	47.6
09:30:00	51.1	53.1	UNDER	52.6	48.6
09:30:30	53.7	59.8	UNDER	55.6	48.6
09:31:00	49.3	52.0	UNDER	51.6	46.6
09:31:30	50.3	54.0	UNDER	53.6	46.6
09:32:00	47.7	48.7	UNDER	48.6	46.6
09:32:30	46.9	50.8	UNDER	48.6	45.6
09:33:00	55.6	60.4	UNDER	59.6	48.6
09:33:30	51.1	53.2	UNDER	52.6	49.6
09:34:00	51.2	54.2	UNDER	53.6	48.6
09:34:30	47.3	51.2	UNDER	48.6	46.6
09:35:00	49.6	52.7	UNDER	51.6	46.6
09:35:30	50.1	51.3	UNDER	50.6	48.6
09:36:00	51.8	55.7	UNDER	53.6	50.6
09:36:30	51.8	56.1	UNDER	54.6	48.6
09:37:00	52.6	55.3	UNDER	54.6	48.6
09:37:30	51.2	54.2	UNDER	53.6	48.6
09:38:00	49.2	52.3	UNDER	51.6	47.6
09:38:30	49.5	50.8	UNDER	50.6	48.6
09:39:00	48.6	50.1	UNDER	49.6	46.6
09:39:30	50.3	57.2	UNDER	54.6	46.6
09:40:00	52.1	59.6	UNDER	54.6	47.6
09:40:30	54.9	61.3	UNDER	58.6	48.6
09:41:00	47.4	51.4	UNDER	48.6	45.6
09:41:30	47.5	49.3	UNDER	48.6	46.6
09:42:00	48.8	50.7	UNDER	49.6	47.6
09:42:30	50.5	58.8	UNDER	52.6	46.6
09:43:00	82.6	92.1	112.3	88.6	46.6
09:43:30	79.9	90.5	UNDER	86.6	51.6
09:44:00	64.4	78.8	UNDER	66.6	50.6
09:44:30	82.7	93.0	111.2	88.6	47.6
09:45:00	79.7	90.4	111.2	85.6	48.6
09:45:30	50.1	54.2	UNDER	52.6	47.6
09:46:00	48.7	51.5	UNDER	50.6	47.6
09:46:30	48.6	51.4	UNDER	50.6	47.6
09:47:00	48.5	51.1	UNDER	50.6	46.6
09:47:30	47.2	48.4	UNDER	47.6	46.6
09:48:00	48.3	49.1	UNDER	48.6	46.6
09:48:30	46.6	48.6	UNDER	47.6	45.6
09:49:00	48.1	49.3	UNDER	48.6	46.6
09:49:30	54.6	60.4	UNDER	58.6	48.6
09:50:00	50.2	53.4	UNDER	52.6	47.6
09:50:30	48.8	52.4	UNDER	50.6	46.6
09:51:00	48.8	50.4	UNDER	50.6	46.6
09:51:30	50.9	52.0	UNDER	51.6	48.6
09:52:00	48.9	52.1	UNDER	51.6	47.6
09:52:30	50.8	51.9	UNDER	51.6	48.6
09:53:00	50.5	53.3	UNDER	53.6	48.6

09:53:30	53.0	54.5	UNDER	54.6	50.6
09:54:00	50.5	53.7	UNDER	52.6	49.6
09:54:30	49.6	51.2	UNDER	50.6	48.6
09:55:00	49.3	51.2	UNDER	50.6	46.6
09:55:30	49.6	52.0	UNDER	50.6	46.6
09:56:00	50.4	51.2	UNDER	50.6	49.6
09:56:30	50.1	51.2	UNDER	50.6	48.6
09:57:00	52.3	58.2	UNDER	54.6	49.6
09:57:30	50.0	52.4	UNDER	51.6	48.6
09:58:00	51.4	52.9	UNDER	52.6	48.6
09:58:30	49.9	57.7	UNDER	51.6	46.6
09:59:00	58.9	64.1	UNDER	62.6	51.6
09:59:30	50.7	53.3	UNDER	52.6	46.6
10:00:00	51.0	54.4	UNDER	53.6	47.6
10:00:30	52.7	55.1	UNDER	54.6	49.6
10:01:00	52.6	54.9	UNDER	54.6	50.6
10:01:30	51.0	53.9	UNDER	52.6	48.6
10:02:00	51.9	54.1	UNDER	53.6	48.6
10:02:30	52.1	54.9	UNDER	52.6	50.6
10:03:00	55.2	61.6	UNDER	58.6	49.6
10:03:30	49.7	51.0	UNDER	50.6	48.6
10:04:00	50.4	51.8	UNDER	51.6	48.6
10:04:30	48.8	50.8	UNDER	50.6	46.6
10:05:00	52.4	56.5	UNDER	55.6	47.6
10:05:30	49.8	50.9	UNDER	50.6	48.6
10:06:00	50.0	51.6	UNDER	51.6	47.6
10:06:30	51.4	54.3	UNDER	52.6	50.6
10:07:00	50.7	52.0	UNDER	51.6	49.6
10:07:30	51.2	53.2	UNDER	52.6	48.6
10:08:00	49.2	51.1	UNDER	50.6	46.6
10:08:30	51.4	56.0	UNDER	54.6	48.6
10:09:00	51.5	56.7	UNDER	54.6	48.6
10:09:30	49.3	51.7	UNDER	51.6	46.6
10:10:00	50.9	55.6	UNDER	54.6	47.6
10:10:30	54.7	58.5	UNDER	57.6	51.6
10:11:00	53.5	56.5	UNDER	54.6	50.6
10:11:30	53.3	56.3	UNDER	55.6	50.6
10:12:00	51.4	52.4	UNDER	52.6	50.6
10:12:30	50.9	53.2	UNDER	52.6	49.6
10:13:00	50.6	55.6	UNDER	51.6	48.6
10:13:30	58.0	63.6	UNDER	62.6	48.6
10:14:00	51.8	55.0	UNDER	53.6	48.6
10:14:30	53.0	56.4	UNDER	54.6	49.6
10:15:00	52.0	55.5	UNDER	53.6	49.6
10:15:30	52.5	54.2	UNDER	53.6	50.6
10:16:00	52.6	54.5	UNDER	53.6	51.6
10:16:30	53.1	57.5	UNDER	55.6	49.6
10:17:00	50.2	54.4	UNDER	52.6	48.6
10:17:30	51.7	54.8	UNDER	53.6	49.6
10:18:00	51.8	53.8	UNDER	53.6	50.6
10:18:30	56.5	61.7	UNDER	60.6	51.6
10:19:00	53.9	58.5	UNDER	57.6	49.6
10:19:30	62.7	67.8	UNDER	66.6	52.6
10:20:00	53.6	59.2	UNDER	56.6	50.6
10:20:30	53.4	58.9	UNDER	55.6	50.6
10:21:00	52.7	56.8	UNDER	53.6	50.6
10:21:30	49.8	51.5	UNDER	51.6	48.6
10:22:00	51.3	54.9	UNDER	53.6	46.6
10:22:30	52.4	56.3	UNDER	55.6	46.6
10:23:00	53.3	56.4	UNDER	55.6	51.6
10:23:30	52.0	54.9	UNDER	53.6	49.6
10:24:00	49.7	51.2	UNDER	50.6	48.6
10:24:30	50.6	53.2	UNDER	52.6	48.6

10:25:00	49.5	51.6	UNDER	50.6	47.6
10:25:30	51.4	52.9	UNDER	52.6	49.6
10:26:00	50.0	51.6	UNDER	50.6	48.6
10:26:30	49.7	50.8	UNDER	50.6	48.6
10:27:00	50.5	52.5	UNDER	51.6	48.6
10:27:30	50.6	52.1	UNDER	52.6	48.6
10:28:00	50.3	51.7	UNDER	51.6	48.6
10:28:30	51.2	56.0	UNDER	54.6	47.6
10:29:00	52.6	58.2	UNDER	56.6	47.6
10:29:30	51.5	55.1	UNDER	53.6	48.6
10:30:00	51.2	54.5	UNDER	52.6	49.6
10:30:30	52.8	56.4	UNDER	54.6	49.6
10:31:00	52.1	54.8	UNDER	53.6	50.6
10:31:30	50.1	51.3	UNDER	51.6	48.6
10:32:00	50.6	52.2	UNDER	51.6	48.6
10:32:30	50.6	55.6	UNDER	52.6	48.6
10:33:00	49.2	51.6	UNDER	50.6	48.6
10:33:30	52.6	55.9	UNDER	54.6	49.6
10:34:00	52.7	55.4	UNDER	54.6	49.6
10:34:30	52.4	55.6	UNDER	53.6	50.6
10:35:00	51.4	54.6	UNDER	52.6	49.6
10:35:30	51.0	53.2	UNDER	52.6	48.6
10:36:00	51.6	53.6	UNDER	52.6	50.6
10:36:30	50.4	52.9	UNDER	51.6	48.6
10:37:00	48.8	50.5	UNDER	50.6	47.6
10:37:30	48.4	49.4	UNDER	49.6	46.6
10:38:00	48.7	50.9	UNDER	50.6	47.6
10:38:30	49.5	50.8	UNDER	50.6	48.6
10:39:00	49.8	52.0	UNDER	51.6	47.6
10:39:30	49.9	51.2	UNDER	50.6	48.6
10:40:00	50.5	52.9	UNDER	52.6	48.6
10:40:30	50.7	52.0	UNDER	51.6	49.6
10:41:00	49.4	50.9	UNDER	50.6	47.6
10:41:30	48.6	51.2	UNDER	49.6	47.6
10:42:00	51.4	53.3	UNDER	52.6	50.6
10:42:30	50.7	52.8	UNDER	52.6	48.6
10:43:00	51.8	52.9	UNDER	52.6	50.6
10:43:30	51.1	52.8	UNDER	52.6	49.6
10:44:00	51.5	54.2	UNDER	53.6	49.6
10:44:30	48.2	50.4	UNDER	49.6	46.6
10:45:00	51.2	53.3	UNDER	52.6	48.6
10:45:30	51.3	52.5	UNDER	52.6	49.6
10:46:00	54.3	59.2	UNDER	57.6	50.6
10:46:30	63.5	75.7	UNDER	58.6	54.6

```
**********************************************************************
Filename..............TMS2-1
Test Location..........558 Skyline Dr (vacant)
Employee Name..........AJD ERZ
Employee Number........
Department.............ENV
          short-term noise measurem
          ents of existing ambient
          noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 3895
REPORT PRINTED ON 09/06/17 at 21:02:34

User ID: _____________________________




LOGGING STARTED......09/06/17 at 15:21:00
TOTAL LOGGING TIME...0 DAYS 00:51:04
LOGGING STOPPED......09/06/17 at 16:12:04
TOTAL INTERVALS......103
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/06/17 AT 13:16:36
PRE-TEST CALIBRATION RANGE...39.2 TO 139.2 dB
POST-TEST CALIBRATION TIME...09/06/17 AT 18:33:53
POST-TEST CALIBRATION RANGE...39.1 TO 139.1
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS................. 80dB  90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  51.8dB
Lav ( 80)......  39.2dB
Lav ( 90)......  39.2dB
SEL.............  86.5dB

TWA.............  42.1dB
TWA ( 80)......  39.2dB
TWA ( 90)......  39.2dB

Lmax............  77.3dB  09/06/17 at 16:12:02
Lpk.............UNDER RANGE
TIME OVER 115dB...00:00:00.00
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DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/06/17					
15:21:00	62.2	68.2	UNDER	66.2	52.2
15:21:30	59.3	66.5	UNDER	64.2	50.2
15:22:00	52.9	58.9	UNDER	56.2	45.2
15:22:30	46.1	46.7	UNDER	46.2	45.2
15:23:00	46.3	46.8	UNDER	46.2	45.2
15:23:30	46.0	46.9	UNDER	46.2	44.2
15:24:00	45.9	46.7	UNDER	46.2	45.2
15:24:30	45.8	46.2	UNDER	46.2	45.2
15:25:00	45.6	46.5	UNDER	46.2	44.2
15:25:30	45.9	46.4	UNDER	46.2	45.2
15:26:00	46.0	46.4	UNDER	46.2	45.2
15:26:30	45.9	46.3	UNDER	46.2	45.2
15:27:00	45.5	46.2	UNDER	45.2	45.2
15:27:30	46.1	48.1	UNDER	46.2	45.2
15:28:00	46.7	48.6	UNDER	47.2	45.2
15:28:30	46.5	49.4	UNDER	47.2	45.2
15:29:00	46.2	47.7	UNDER	46.2	45.2
15:29:30	46.1	47.3	UNDER	46.2	45.2
15:30:00	47.2	48.2	UNDER	47.2	45.2
15:30:30	46.4	48.1	UNDER	46.2	45.2
15:31:00	46.2	46.7	UNDER	46.2	45.2
15:31:30	55.3	66.5	UNDER	57.2	46.2
15:32:00	50.8	63.4	UNDER	53.2	44.2
15:32:30	46.3	54.1	UNDER	47.2	44.2
15:33:00	47.4	48.1	UNDER	48.2	46.2
15:33:30	46.5	49.3	UNDER	46.2	45.2
15:34:00	46.4	47.3	UNDER	46.2	45.2
15:34:30	46.5	47.7	UNDER	46.2	45.2
15:35:00	47.3	48.2	UNDER	47.2	46.2
15:35:30	48.4	49.3	UNDER	48.2	47.2
15:36:00	48.6	49.3	UNDER	48.2	48.2
15:36:30	48.4	49.0	UNDER	48.2	48.2
15:37:00	49.2	49.7	UNDER	49.2	48.2
15:37:30	49.3	50.1	UNDER	49.2	48.2
15:38:00	50.1	57.3	UNDER	50.2	48.2
15:38:30	49.5	50.1	UNDER	49.2	48.2
15:39:00	48.6	49.7	UNDER	49.2	47.2
15:39:30	48.4	48.9	UNDER	48.2	48.2
15:40:00	48.2	48.9	UNDER	48.2	47.2
15:40:30	48.2	48.5	UNDER	48.2	47.2
15:41:00	48.5	49.3	UNDER	49.2	47.2
15:41:30	49.2	49.7	UNDER	49.2	48.2
15:42:00	49.5	50.1	UNDER	49.2	48.2
15:42:30	49.3	49.8	UNDER	49.2	48.2
15:43:00	49.5	50.1	UNDER	50.2	48.2
15:43:30	56.6	66.1	UNDER	62.2	49.2
15:44:00	48.9	51.0	UNDER	49.2	48.2
15:44:30	48.6	48.9	UNDER	48.2	48.2
15:45:00	48.5	48.9	UNDER	48.2	47.2
15:45:30	49.4	56.9	UNDER	49.2	47.2
15:46:00	49.0	49.3	UNDER	49.2	48.2

15:46:30	49.2	49.7	UNDER	49.2	48.2
15:47:00	48.9	49.3	UNDER	49.2	48.2
15:47:30	49.0	49.3	UNDER	49.2	48.2
15:48:00	48.7	49.3	UNDER	48.2	47.2
15:48:30	50.2	60.5	UNDER	50.2	47.2
15:49:00	47.4	48.1	UNDER	48.2	46.2
15:49:30	47.3	48.1	UNDER	47.2	46.2
15:50:00	47.5	48.1	UNDER	47.2	46.2
15:50:30	49.2	57.7	UNDER	51.2	47.2
15:51:00	53.1	62.3	UNDER	56.2	48.2
15:51:30	50.6	59.7	UNDER	52.2	44.2
15:52:00	44.6	45.3	UNDER	45.2	43.2
15:52:30	49.9	62.5	UNDER	51.2	44.2
15:53:00	46.7	48.4	UNDER	47.2	45.2
15:53:30	46.0	47.8	UNDER	46.2	44.2
15:54:00	47.0	49.3	UNDER	48.2	44.2
15:54:30	49.9	52.1	UNDER	51.2	48.2
15:55:00	58.2	66.1	UNDER	64.2	44.2
15:55:30	47.2	49.8	UNDER	49.2	43.2
15:56:00	48.0	50.1	UNDER	49.2	43.2
15:56:30	44.8	46.5	UNDER	46.2	43.2
15:57:00	49.6	52.9	UNDER	52.2	44.2
15:57:30	50.6	53.7	UNDER	53.2	45.2
15:58:00	56.6	66.0	UNDER	62.2	45.2
15:58:30	45.8	47.1	UNDER	46.2	45.2
15:59:00	47.4	52.5	UNDER	48.2	46.2
15:59:30	49.7	56.5	UNDER	54.2	46.2
16:00:00	46.8	48.1	UNDER	47.2	45.2
16:00:30	46.3	48.1	UNDER	46.2	45.2
16:01:00	47.6	48.5	UNDER	48.2	46.2
16:01:30	47.7	52.9	UNDER	48.2	45.2
16:02:00	46.0	47.3	UNDER	46.2	45.2
16:02:30	46.8	48.1	UNDER	47.2	44.2
16:03:00	48.4	49.3	UNDER	48.2	48.2
16:03:30	48.9	49.4	UNDER	49.2	48.2
16:04:00	53.1	59.7	UNDER	57.2	48.2
16:04:30	49.5	51.3	UNDER	50.2	48.2
16:05:00	58.5	68.9	UNDER	63.2	49.2
16:05:30	49.2	50.1	UNDER	49.2	48.2
16:06:00	49.8	50.5	UNDER	50.2	49.2
16:06:30	57.2	71.3	UNDER	58.2	48.2
16:07:00	49.7	51.3	UNDER	50.2	48.2
16:07:30	49.0	50.6	UNDER	49.2	48.2
16:08:00	48.7	49.5	UNDER	49.2	48.2
16:08:30	48.1	49.7	UNDER	49.2	46.2
16:09:00	46.9	47.7	UNDER	47.2	46.2
16:09:30	48.4	49.3	UNDER	48.2	46.2
16:10:00	48.6	49.6	UNDER	49.2	47.2
16:10:30	48.6	48.9	UNDER	48.2	47.2
16:11:00	48.6	49.0	UNDER	48.2	48.2
16:11:30	50.4	56.0	UNDER	52.2	47.2
16:12:00	73.5	77.3	UNDER	76.2	49.2

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**********************************************************************
Filename..............TMS2-3
Test Location.........473 Orchard Hill Road
Employee Name.........AJD ERZ
Employee Number........
Department............ENV
          short-term noise measurem
          ents of existing ambient
          noise - Beckley Z-Way

Calibrator Type........MetrosonicsCL304 (SN3616)
Calibrator Cal. Date...04-13-17
**********************************************************************

METROSONICS db-3080  V1.12  SERIAL # 3897
REPORT PRINTED ON 09/06/17 at 21:02:51

User ID: _____________________________




LOGGING STARTED......09/06/17 at 15:16:00
TOTAL LOGGING TIME...0 DAYS 00:52:44
LOGGING STOPPED......09/06/17 at 16:08:44
TOTAL INTERVALS......106
INTERVAL LENGTH......00:00:30

AUTO STOP............NO
CLOCK SYNCH..........YES
RESPONSE RATE........SLOW
FILTER...............A WT.

PRE-TEST CALIBRATION TIME....09/06/17 AT 13:21:42
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION TIME...09/06/17 AT 18:51:40
POST-TEST CALIBRATION RANGE...40.0 TO 140.0
CUTOFF USED FOR TIME HISTORY Lav...NONE


<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE..........3dB
CUTOFFS................. 80dB  90dB
CEILING................115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav.............  54.3dB
Lav ( 80)......  39.9dB
Lav ( 90)......  39.9dB
SEL.............  89.2dB

TWA.............  44.8dB
TWA ( 80)......  39.9dB
TWA ( 90)......  39.9dB

Lmax............  76.9dB  09/06/17 at 15:16:48
Lpk.............UNDER RANGE
TIME OVER 115dB...00:00:00.00
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DOSE (80)........ 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)........ 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
09/06/17					
15:16:00	65.7	74.7	UNDER	71.9	47.9
15:16:30	69.9	76.9	UNDER	73.9	51.9
15:17:00	69.2	76.8	UNDER	73.9	49.9
15:17:30	65.2	76.8	UNDER	71.9	41.9
15:18:00	41.6	44.4	UNDER	41.9	41.9
15:18:30	42.1	44.7	UNDER	42.9	41.9
15:19:00	41.9	42.8	UNDER	42.9	41.9
15:19:30	42.1	43.6	UNDER	42.9	41.9
15:20:00	42.1	43.2	UNDER	42.9	41.9
15:20:30	42.9	46.0	UNDER	43.9	41.9
15:21:00	42.7	45.6	UNDER	43.9	41.9
15:21:30	44.8	48.4	UNDER	47.9	42.9
15:22:00	42.4	42.9	UNDER	42.9	41.9
15:22:30	42.2	43.4	UNDER	42.9	41.9
15:23:00	44.7	47.6	UNDER	45.9	43.9
15:23:30	44.0	45.7	UNDER	44.9	43.9
15:24:00	44.0	47.0	UNDER	44.9	41.9
15:24:30	43.7	44.4	UNDER	44.9	43.9
15:25:00	43.5	44.4	UNDER	44.9	41.9
15:25:30	43.7	44.0	UNDER	44.9	42.9
15:26:00	43.8	44.3	UNDER	44.9	42.9
15:26:30	43.8	44.4	UNDER	44.9	42.9
15:27:00	44.2	44.8	UNDER	44.9	42.9
15:27:30	41.9	44.3	UNDER	42.9	41.9
15:28:00	42.2	44.0	UNDER	43.9	41.9
15:28:30	41.5	42.0	UNDER	41.9	41.9
15:29:00	41.6	42.4	UNDER	41.9	41.9
15:29:30	41.7	42.2	UNDER	42.9	41.9
15:30:00	41.8	42.4	UNDER	42.9	41.9
15:30:30	44.5	50.2	UNDER	46.9	41.9
15:31:00	44.7	49.9	UNDER	47.9	41.9
15:31:30	43.6	48.3	UNDER	47.9	41.9
15:32:00	41.8	43.2	UNDER	42.9	41.9
15:32:30	48.9	55.2	UNDER	53.9	41.9
15:33:00	47.3	53.9	UNDER	51.9	42.9
15:33:30	43.1	47.1	UNDER	46.9	41.9
15:34:00	41.5	42.1	UNDER	41.9	41.9
15:34:30	42.1	44.7	UNDER	43.9	40.9
15:35:00	45.0	45.7	UNDER	45.9	44.9
15:35:30	44.6	46.4	UNDER	46.9	43.9
15:36:00	43.8	44.0	UNDER	44.9	43.9
15:36:30	43.6	44.0	UNDER	43.9	43.9
15:37:00	44.4	46.4	UNDER	44.9	43.9
15:37:30	41.8	44.5	UNDER	42.9	41.9
15:38:00	49.6	55.1	UNDER	52.9	41.9
15:38:30	53.5	57.4	UNDER	56.9	42.9
15:39:00	42.3	43.6	UNDER	42.9	41.9
15:39:30	42.3	43.6	UNDER	42.9	41.9
15:40:00	41.8	43.2	UNDER	42.9	41.9
15:40:30	41.4	44.0	UNDER	42.9	41.9
15:41:00	44.0	46.0	UNDER	45.9	41.9

15:41:30	45.5	46.4	UNDER	46.9	43.9
15:42:00	45.7	47.1	UNDER	46.9	43.9
15:42:30	50.4	58.7	UNDER	55.9	42.9
15:43:00	41.9	43.5	UNDER	42.9	41.9
15:43:30	45.3	49.9	UNDER	48.9	41.9
15:44:00	42.3	43.2	UNDER	42.9	41.9
15:44:30	42.5	44.4	UNDER	43.9	41.9
15:45:00	41.5	42.8	UNDER	42.9	41.9
15:45:30	43.0	45.2	UNDER	44.9	41.9
15:46:00	42.8	43.6	UNDER	43.9	42.9
15:46:30	42.9	43.6	UNDER	43.9	42.9
15:47:00	43.8	44.0	UNDER	44.9	43.9
15:47:30	44.1	46.4	UNDER	45.9	43.9
15:48:00	46.7	50.1	UNDER	48.9	45.9
15:48:30	44.0	48.0	UNDER	45.9	41.9
15:49:00	41.6	42.4	UNDER	42.9	40.9
15:49:30	41.9	43.2	UNDER	42.9	41.9
15:50:00	46.5	52.4	UNDER	51.9	41.9
15:50:30	42.1	42.5	UNDER	42.9	41.9
15:51:00	42.4	44.0	UNDER	43.9	41.9
15:51:30	41.8	43.1	UNDER	42.9	41.9
15:52:00	41.5	41.9	UNDER	41.9	41.9
15:52:30	42.1	43.2	UNDER	42.9	41.9
15:53:00	41.9	42.3	UNDER	42.9	41.9
15:53:30	41.7	42.0	UNDER	41.9	41.9
15:54:00	42.1	44.0	UNDER	42.9	41.9
15:54:30	42.2	42.8	UNDER	42.9	41.9
15:55:00	44.4	48.4	UNDER	46.9	41.9
15:55:30	42.7	46.4	UNDER	44.9	41.9
15:56:00	42.2	43.9	UNDER	43.9	41.9
15:56:30	42.4	44.4	UNDER	43.9	41.9
15:57:00	41.7	42.4	UNDER	42.9	41.9
15:57:30	43.0	45.1	UNDER	44.9	41.9
15:58:00	48.3	51.9	UNDER	51.9	44.9
15:58:30	48.6	54.4	UNDER	53.9	43.9
15:59:00	46.7	52.8	UNDER	49.9	43.9
15:59:30	42.0	43.6	UNDER	42.9	41.9
16:00:00	42.6	44.1	UNDER	43.9	41.9
16:00:30	43.1	45.7	UNDER	44.9	41.9
16:01:00	44.7	46.3	UNDER	45.9	42.9
16:01:30	42.6	43.6	UNDER	43.9	41.9
16:02:00	43.6	44.8	UNDER	44.9	42.9
16:02:30	45.2	48.4	UNDER	46.9	43.9
16:03:00	49.3	56.1	UNDER	54.9	44.9
16:03:30	49.9	58.3	UNDER	53.9	44.9
16:04:00	45.6	46.9	UNDER	46.9	43.9
16:04:30	44.7	46.0	UNDER	45.9	42.9
16:05:00	44.6	50.8	UNDER	46.9	41.9
16:05:30	42.5	46.2	UNDER	43.9	41.9
16:06:00	41.8	43.2	UNDER	42.9	41.9
16:06:30	42.1	43.3	UNDER	43.9	41.9
16:07:00	43.1	44.1	UNDER	43.9	42.9
16:07:30	51.3	60.8	UNDER	57.9	41.9
16:08:00	47.8	56.4	UNDER	50.9	42.9
16:08:30	47.5	56.7	UNDER	52.9	42.9

APPENDIX C -
NOISE METER AND CALIBRATOR CALIBRATION CERTIFICATES

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3895**
Calibration Recall No:	**27540**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 13-Apr-17

Felix Christopher (QA Mgr.)

Certificate No: 27540 - 1

QA Doc. #1051 Rev. 2.0 10/1/01

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3895

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.1		102.1	
,1.	Level Accuracy	93.4	94.6	94dB	94.1		94.1	
		103.4	104.6	104dB	104.1		104.1	
		113.4	114.6	114dB	114.0		114.0	
,2.	Frequency Response	88.0	97.8	8kHz	93.7		93.7	
	A Weighting	92.1	97.9	4kHz	94.1		94.1	
		93.3	97.1	2kHz	94.9		94.9	
		92.6	95.4	1kHz	94.1		94.1	
		89.4	92.2	500Hz	91.1		91.1	
		84.0	86.8	250Hz	85.3		85.3	
		76.5	79.3	125Hz	78.1		78.1	
		65.9	69.7	63Hz	67.1		67.1	
		51.8	57.5	31.5Hz	53.7		53.7	
	C Weighting	86.1	95.9	8kHz	92.1		92.1	
		90.3	96.1	4kHz	92.5		92.5	
		91.9	95.7	2kHz	94.1		94.1	
		92.6	95.4	1kHz	94.1		94.1	
		92.6	95.4	500Hz	94.5		94.5	
		92.6	95.4	250Hz	94.5		94.5	
		92.4	95.2	125Hz	94.5		94.5	
		91.3	95.1	63Hz	93.7		93.7	
		88.2	93.9	31.5Hz	90.9		90.9	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.1		114.1	
	L pk	116.1	117.9		116.7		116.7	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.16%		0.16%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.77%		0.77%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.71%		2.71%	
4	Inherent noise level				42.3		42.3	

Measurements performed by:

Calibration Date: 13-Apr-2017 Kent Zeng

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db-3080 **Serial No.: 3895**
Company: Skelly & Joy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	20.0	°C
Ambient Humidity:	32.1	% RH
Ambient Pressure:	100.871	kPa
Calibration Date:	13-Apr-2017	
Calibration Due:	13-Apr-2018	
Report Number:	27540 -1	
Control Number:	27540	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The expanded uncertainty of calibration: 0.3dB at 95% confidence level with a coverage factor of k=2.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 db3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	17-Jul-2016	822/275722-15	17-Jul-2017

Cal. Date: 13-Apr-2017
Calibrated on WCCL system type 9700

Measurements performed by: .....
Kent Zeng

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3897**
Calibration Recall No:	**27540**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 13-Apr-17

Felix Christopher (QA Mgr.)

Certificate No: 27540 - 2

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

uncompromised calibration **West Caldwell Calibration Laboratories, Inc.**
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 3897

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	113.8		113.8	
,2.	Frequency Response	88.0	97.8	8kHz	93.6		93.6	
	A Weighting	92.1	97.9	4kHz	92.1		92.1	
		93.3	97.1	2kHz	94.1		94.1	
		92.6	95.4	1kHz	94.0		94.0	
		89.4	92.2	500Hz	91.3		91.3	
		84.0	86.8	250Hz	85.7		85.7	
		76.5	79.3	125Hz	77.7		77.7	
		65.9	69.7	63Hz	66.9		66.9	
		51.8	57.5	31.5Hz	53.5		53.5	
	C Weighting	86.1	95.9	8kHz	94.1		94.1	
		90.3	96.1	4kHz	90.9		90.9	
		91.9	95.7	2kHz	92.5		92.5	
		92.6	95.4	1kHz	93.7		93.7	
		92.6	95.4	500Hz	94.2		94.2	
		92.6	95.4	250Hz	94.5		94.5	
		92.4	95.2	125Hz	94.5		94.5	
		91.3	95.1	63Hz	93.7		93.7	
		88.2	93.9	31.5Hz	90.8		90.8	
,3								
	SLM	113.4	114.6		113.7		113.7	
	L avg. / Leq	113.4	114.6		113.7		113.7	
	L max.	113.4	114.6		113.7		113.7	
	L pk	116.1	117.9		116.6		116.6	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.14%		0.14%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.62%		0.62%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.46%		2.46%	
4	Inherent noise level				42.1		42.1	

Measurements performed by:

Calibration Date: 13-Apr-2017 Kent Zeng

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db-3080 **Serial No.: 3897**
Company: Skelly & Joy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	20.0	°C
Ambient Humidity:	32.1	% RH
Ambient Pressure:	100.871	kPa
Calibration Date:	13-Apr-2017	
Calibration Due:	13-Apr-2018	
Report Number:	27540 -2	
Control Number:	27540	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The expanded uncertainty of calibration: 0.3dB at 95% confidence level with a coverage factor of k=2.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 db3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	17-Jul-2016	822/275722-15	17-Jul-2017

Cal. Date: 13-Apr-2017

Measurements performed by: .....
Kent Zeng

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**4618**
Calibration Recall No:	**27540**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 13-Apr-17

Felix Christopher (QA Mgr.)

Certificate No: 27540 - 3

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

uncompromised calibration **West Caldwell Calibration Laboratories, Inc.**
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 4618

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.0		94.0	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	114.0		114.0	
,2.	Frequency Response	88.0	97.8	8kHz	92.4		92.4	
	A Weighting	92.1	97.9	4kHz	92.8		92.8	
		93.3	97.1	2kHz	94.4		94.4	
		92.6	95.4	1kHz	94.0		94.0	
		89.4	92.2	500Hz	91.1		91.1	
		84.0	86.8	250Hz	85.6		85.6	
		76.5	79.3	125Hz	78.4		78.4	
		65.9	69.7	63Hz	68.0		68.0	
		51.8	57.5	31.5Hz	55.0		55.0	
	C Weighting	86.1	95.9	8kHz	90.6		90.6	
		90.3	96.1	4kHz	91.2		91.2	
		91.9	95.7	2kHz	93.1		93.1	
		92.6	95.4	1kHz	94.0		94.0	
		92.6	95.4	500Hz	94.2		94.2	
		92.6	95.4	250Hz	94.4		94.4	
		92.4	95.2	125Hz	94.2		94.2	
		91.3	95.1	63Hz	93.5		93.5	
		88.2	93.9	31.5Hz	91.0		91.0	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.0		114.0	
	L pk	116.1	117.9		116.9		116.9	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.17%		0.17%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.78%		0.78%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		3.06%		3.06%	
4	Inherent noise level				43.3		43.3	

Measurements performed by:

Calibration Date: 13-Apr-2017 Kent Zeng

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db-3080 **Serial No.: 4618**
Company: Skelly & Joy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	20.0	°C
Ambient Humidity:	32.1	% RH
Ambient Pressure:	100.871	kPa
Calibration Date:	13-Apr-2017	
Calibration Due:	13-Apr-2018	
Report Number:	27540 -3	
Control Number:	27540	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The expanded uncertainty of calibration: 0.3dB at 95% confidence level with a coverage factor of k=2.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 db3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	17-Jul-2016	822/275722-15	17-Jul-2017

Cal. Date: 13-Apr-2017
Calibrated on WCCL system type 9700

Measurements performed by: .....
Kent Zeng

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**5093**
Calibration Recall No:	**27540**

Submitted By:

Customer:	**ALAN J. DUNAY**
Company:	**SKELLY & LOY, INC.**
Address:	**449 EISENHOWER BLVD., STE. 300**
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Calibration Date: 13-Apr-17

Felix Christopher (QA Mgr.)

Certificate No: 27540 - 4

QA Doc. #1051 Rev. 2.0 10/1/01

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Manufacturer: Metrosonics

Permissible Sound Level Meter Model No.: db-3080 S/N: 5093

Submitted by, Company: Skelly & Loy, Inc.

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,0.	SPL Reading with 102.0dB SPL	101.4	102.6		102.0		102.0	
,1.	Level Accuracy	93.4	94.6	94dB	94.1		94.1	
		103.4	104.6	104dB	104.0		104.0	
		113.4	114.6	114dB	114.1		114.1	
,2.	Frequency Response	88.0	97.8	8kHz	94.2		94.2	
	A Weighting	92.1	97.9	4kHz	94.1		94.1	
		93.3	97.1	2kHz	95.0		95.0	
		92.6	95.4	1kHz	93.8		93.8	
		89.4	92.2	500Hz	91.2		91.2	
		84.0	86.8	250Hz	85.3		85.3	
		76.5	79.3	125Hz	77.8		77.8	
		65.9	69.7	63Hz	67.3		67.3	
		51.8	57.5	31.5Hz	53.8		53.8	
	C Weighting	86.1	95.9	8kHz	92.6		92.6	
		90.3	96.1	4kHz	92.5		92.5	
		91.9	95.7	2kHz	93.8		93.8	
		92.6	95.4	1kHz	94.1		94.1	
		92.6	95.4	500Hz	94.2		94.2	
		92.6	95.4	250Hz	94.2		94.2	
		92.4	95.2	125Hz	94.1		94.1	
		91.3	95.1	63Hz	93.3		93.3	
		88.2	93.9	31.5Hz	90.3		90.3	
,3								
	SLM	113.4	114.6		114.0		114.0	
	L avg. / Leq	113.4	114.6		114.0		114.0	
	L max.	113.4	114.6		114.1		114.1	
	L pk	116.1	117.9		117.2		117.2	
	Dose %							
	0.18% @ 94 dB 1kHz	0.14%	0.22%		0.17%		0.17%	
	0.73% @ 104 dB 1kHz	0.58%	0.88%		0.72%		0.72%	
	2.90% @ 114 dB 1kHz	2.32%	3.48%		2.65%		2.65%	
4	Inherent noise level				42.5		42.5	

Measurements performed by:

Calibration Date: 13-Apr-2017 Kent Zeng

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Permissible Sound Level Meter

Model No.: db-3080 **Serial No.: 5093**
Company: Skelly & Joy, Inc. **I. D. No.: XXXX**

Calibration results:
Before data: ..... **After data:** .....
Before & after data same: ...X...

All tested parameters: Pass

For details see "Calibration Data Record"

Laboratory Environment:		
Ambient Temperature:	**20.0**	°C
Ambient Humidity:	**32.1**	% RH
Ambient Pressure:	**100.871**	kPa
Calibration Date:	**13-Apr-2017**	
Calibration Due:	**13-Apr-2018**	
Report Number:	**27540 -4**	
Control Number:	**27540**	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers listed below.
The expanded uncertainty of calibration: 0.3dB at 95% confidence level with a coverage factor of k=2.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 db3080METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4226	S/N 2272364	17-Jul-2016	822/275722-15	17-Jul-2017

Cal. Date: 13-Apr-2017
Calibrated on WCCL system type 9700

Measurements performed by: .....
Kent Zeng

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	METROSONICS
Model No:	CL304
Serial No:	3616
Calibration Recall No:	27540

Submitted By:

Customer:	ALAN J. DUNAY
Company:	SKELLY & LOY, INC.
Address:	449 EISENHOWER BLVD., STE. 300
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CL304 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Felix Christopher (QA Mgr.)

Calibration Date: 13-Apr-17

Certificate No: 27540 - 5

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	101.95 dB re 20µPa	
	2	101.95	
	3	101.95	
	4	101.95	
	5	101.95	
	6	101.95	
	Average	**101.95**	Spec. 102dB ± 0.3dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	999.95 Hz	
	2	999.99	
	3	999.97	
	Average	**999.97**	Spec. 1000Hz ± 2.0%

Distortion measured	-40.0 dB	Spec. ≤-34dB

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2308998	6-Oct-2016	822/275722-14	6-Oct-2017
Brüel & Kjær	4134	S/N 854464	1-Oct-2016	822/275722-14	1-Oct-2017
Brüel & Kjær	2669	S/N 2148476	8-Oct-2016	683/281764-14	8-Oct-2017
HP	34401A	S/N US360980	5-Oct-2016	,205342	5-Oct-2017
Brüel & Kjær	2636	S/N 1323964	8-Oct-2016	822/275722-14	8-Oct-2017

Cal. Date: 13-Apr-2017 **Tested by: Kent Zeng**

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 3616**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

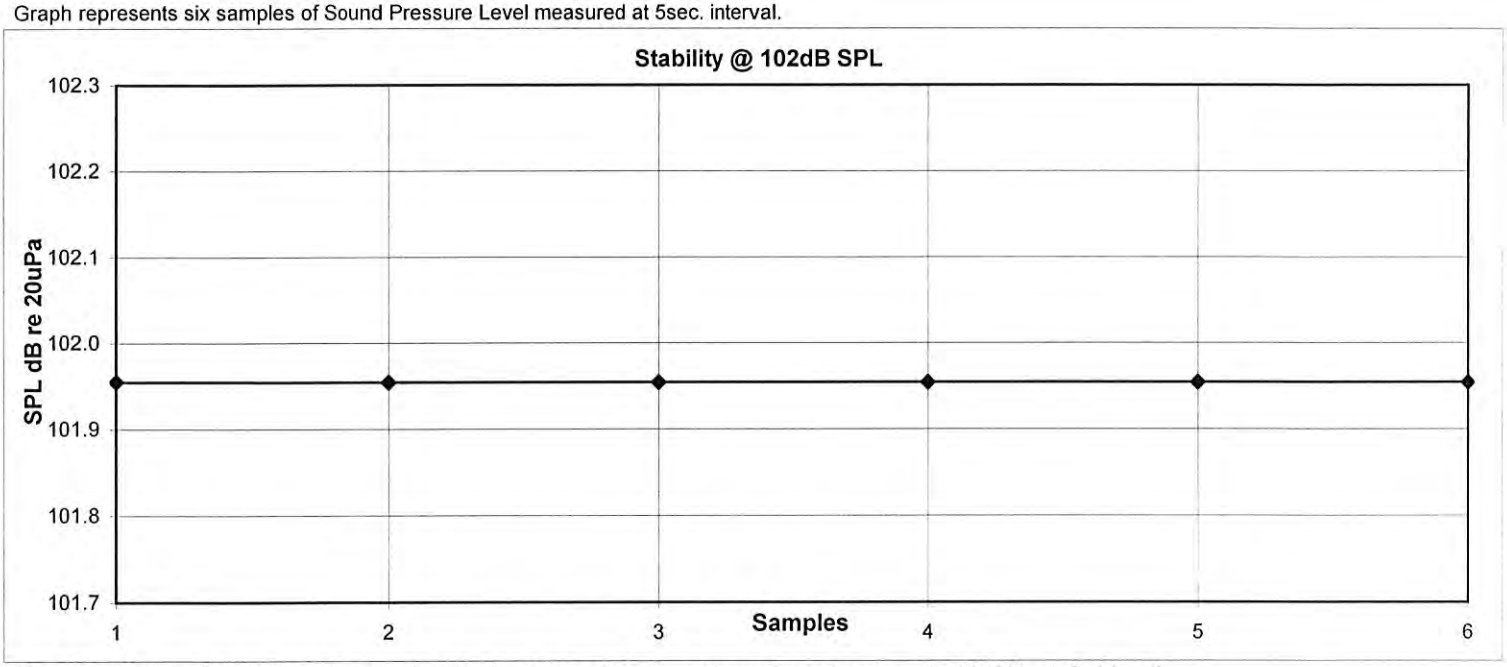
Calibration results:

Before data: ..... **After data:** .....
Before & after data same: ...X...
Sound Pressure Level at 999.97 Hz and pressure of 1013 hPa (mbar)
was 101.95 dB re 20µPa
Sound Pressure Level: **Pass**
Frequency: **Pass**
Distortion: **Pass**
Stability: **Pass**
All tested parameters: **Pass**

Laboratory Environment:		
Ambient Temperature:	20.0	°C
Ambient Humidity:	32.1	% RH
Ambient Pressure:	100.871	kPa
Calibration Date:	13-Apr-2017	
Calibration Due:	13-Apr-2018	
Report Number:	27540	-5
Control Number:	27540	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers: 822/275722-14
The expanded uncertainty of calibration: 0.09dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 13-Apr-2017
Calibrated on WCCL system type 9700

Measurements performed by: .....
Kent Zeng

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	METROSONICS
Model No:	CL304
Serial No:	4480
Calibration Recall No:	27540

Submitted By:

Customer:	ALAN J. DUNAY
Company:	SKELLY & LOY, INC.
Address:	449 EISENHOWER BLVD., STE. 300
	HARRISBURG PA 17111

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CL304 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by: FC

Felix Christopher (QA Mgr.)

Calibration Date: 13-Apr-17

Certificate No: 27540 - 6

ISO/IEC 17025:2005

ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.
1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 4480**
Company: Skelly & Loy, Inc.

All tested parameters: Pass

Measured Sound Pressure Level (Six samples measured at 5 sec. interval)

Sample	1	101.95 dB re 20µPa	
	2	101.95	
	3	101.95	
	4	101.95	
	5	101.95	
	6	101.95	
	Average	**101.95**	Spec. 102dB ± 0.3dB

Frequency measured (Three samples at 30 sec. Interval)

Sample	1	1000.72 Hz	
	2	1000.73	
	3	1000.71	
	Average	**1000.72**	Spec. 1000Hz ± 2.0%

Distortion measured	-35.9 dB	Spec. ≤-34dB

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4231	S/N 2308998	6-Oct-2016	822/275722-14	6-Oct-2017
Brüel & Kjær	4134	S/N 854464	1-Oct-2016	822/275722-14	1-Oct-2017
Brüel & Kjær	2669	S/N 2148476	8-Oct-2016	683/281764-14	8-Oct-2017
HP	34401A	S/N US360980	5-Oct-2016	,205342	5-Oct-2017
Brüel & Kjær	2636	S/N 1323964	8-Oct-2016	822/275722-14	8-Oct-2017

Cal. Date: 13-Apr-2017 **Tested by: Kent Zeng**

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO/IEC 17025: 2005
ACCREDITED
Calibration Lab. Cert. # 1533.01

REPORT OF CALIBRATION

for

Metrosonics Acoustical Calibrator **Model No.: CL304** **Serial No.: 4480**
Company: Skelly & Loy, Inc. **I. D. No.: XXXX**

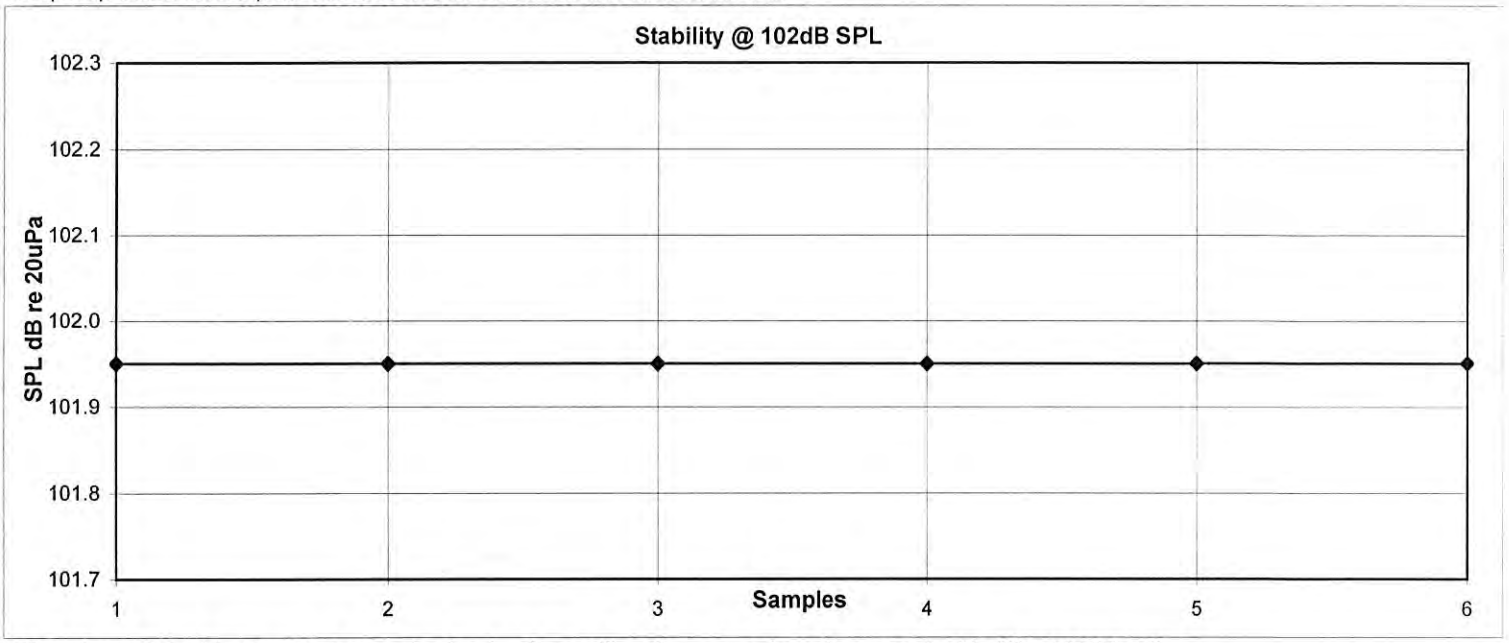
Calibration results:

Before data: ..... **After data:** .....
Before & after data same: ...X...
Sound Pressure Level at 1000.7 Hz and pressure of 1013 hPa (mbar)
was 101.95 dB re 20µPa
Sound Pressure Level: Pass
Frequency: Pass
Distortion: Pass
Stability: Pass
All tested parameters: Pass

Laboratory Environment:		
Ambient Temperature:	20.0	°C
Ambient Humidity:	32.1	% RH
Ambient Pressure:	100.871	kPa
Calibration Date:	13-Apr-2017	
Calibration Due:	13-Apr-2018	
Report Number:	27540 -6	
Control Number:	27540	

The above listed instrument meets or exceeds the tested manufacturer's specifications.
This Calibration is traceable through NIST test numbers: 822/275722-14
The expanded uncertainty of calibration: 0.09dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



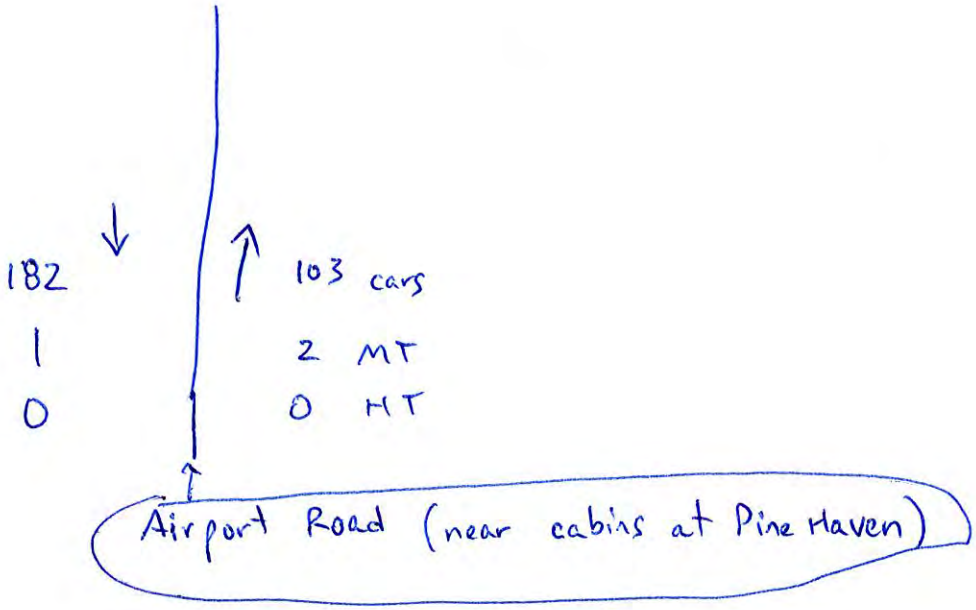
The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 CL304METR**
Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 13-Apr-2017 Measurements performed by: .....
Kent Zeng
Calibrated on WCCL system type 9700

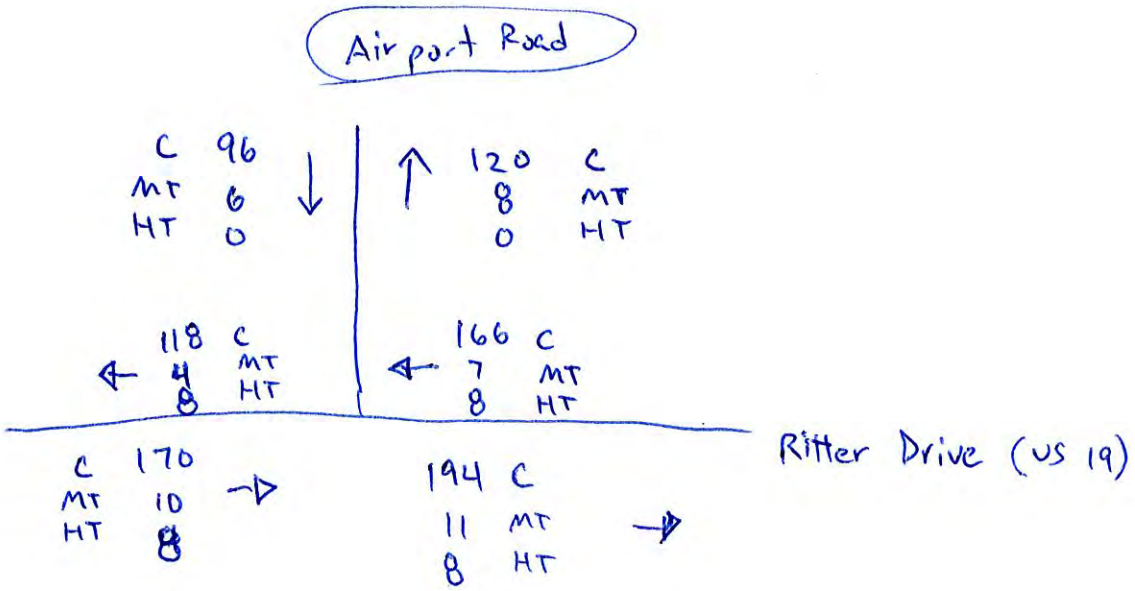
APPENDIX D -
TRAFFIC DATA

2017 Observed Existing Traffic Volumes

TMS 03 9-6-17 4:40 to 5:00 PM



TMS 04 9-7-17 10:05 to 10:25 AM



3 Existing Conditions

3.1. Traffic Conditions

The study area was assessed to evaluate the existing traffic conditions and identify the optimal configuration of the Z-Way and its access points, as well as potential deficiencies within the southern part of the corridor. The assessment included the evaluation of corridor and selected nearby volumes, operational conditions and travel times along the corridor. In conjunction with the assessment, several key analyses were performed to quantitatively measure the existing corridor conditions.
These included crash analyses, capacity analyses and queue length analyses. The results of these analyses provided insight as to the existing problem areas in the study area. The existing roadway network in the study area, lane configurations, land use and turn-lane lengths are provided in Figure 3-1 (Sheets 1 through 4).

3.2. Volumes

Automatic Traffic Recorders (ATRs) were deployed at sixteen (16) locations on April 26, 2017, for a period of 24-hours. Turning movement counts (TMCs) were also collected at eight (8) intersections for the weekday morning peak period (7:00 AM – 10:00 AM), and the weekday afternoon peak period (3:00 PM – 6:00 PM). Based on the manual turning movement counts collected using Miovision technology, the weekday morning peak hour was identified as 7:15 AM to 8:15 AM and the weekday afternoon peak hour was 4:15 PM to 5:15 PM. Peak hour factors (PHFs) and truck percentages were calculated for each intersection and are shown in Table 3-1 and 3-2, respectively. During both the weekday morning and weekday afternoon peak hour, intersections #6 and #7 had a relatively high uniform peak hour indicating that the peak hour contains four 15-minute periods of similar volumes. The PHFs are also generally higher along US 19 for all periods. The truck percentages also appear to be higher during the weekday morning peak hour throughout the study area, compared to the weekday afternoon peak hour. Please refer to Appendix B for detailed turning movement count reports and volume development information. Figure 3-1 (Sheets 1-4) provides the 2017 Peak Hour Volumes (PHVs) for the study area.

Table 3-1: Summary of Peak Hour Factors (PHF) by Intersection

Intersection	AM Peak	PM Peak
1. US 19 Eisenhower Dr and US 19 Connector	0.91	0.91
2. Joe L. Smith Dr and US 19 Connector/ Brookshire Ln	0.80	0.96
3: Airport Rd (CR 9/9) and I-64 WB Ramp/ University Dr	0.81	0.84
4: Airport Rd (CR 9/9) and I-64 EB Ramps	0.84	0.93
5: US 19 Ritter Dr and Airport Rd (WV 307)	0.95	0.97
6: Airport Rd (CR 9/9 and WV 307) and Scott Ridge Rd (WV 307 and CR 9/9)	0.80	0.97
7: US 19 Ritter Dr and WV 307 (Grandview Rd)	0.93	0.96
8: Grandview Rd (WV 307) and Scott Ridge Rd (WV 307)	0.87	0.91
9: US 19 Ritter Dr and Hinton Rd	0.88	0.88

Table 3-2: Summary of Truck Percentages by Intersection[1]

Intersection	AM Peak	PM Peak
1: US 19 Eisenhower Dr and US 19 Connector	5%	2%
2: Joe L. Smith Dr and US 19 Connector/ Brookshire Ln	5%	3%
3: Airport Rd (CR 9/9) and I-64 WB Ramp/ University Dr	7%	3%
4: Airport Rd (CR 9/9) and I-64 EB Ramps	4%	3%
5: US 19 Ritter Dr and Airport Rd (WV 307)	3%	1%
6: Airport Rd (CR 9/9 and WV 307) and Scott Ridge Rd (CR 9/9 and WV 307)	3%	2%
7: US 19 Ritter Dr and Grandview Rd (WV 307)	3%	2%
8: Grandview Rd (WV 307) and Scott Ridge Rd (WV 307)	4%	1%
9: US 19 Ritter Dr and Hinton Rd	3%	1%

Note: 1- Truck Percentage rounded to the nearest whole number

Table 3-3 summarizes the ADT results for the study area. The volumes were collected in 15-minute intervals for 24 hours, and were summarized to provide the ADT values. The ADT values reported in Table 3-3 were a summary of the 24 hour volumes.

On average, over 23,000 vehicles per day travel on I-64 between exits 124 and 125. Approximately 15,000 vehicles per day travel to and from I-64 from the north along I-77. There is also a heavier traffic pattern from the north along US 19 to and from I-64, with a total close to 10,000 vehicles per day.

Table 3-3: Summary of 2017 Average Daily Traffic

Location	Description	ADT (vpd)	ADTT (vpd)	Truck %
1	I-64 WB to the I-77 NB Ramp	7315	1436	20%
2	I-64 WB to the I-77 SB Ramp	1172	159	14%
3	I-77 SB to the I-64 EB Ramp	7310	1176	16%
4	I-77 NB to the I-64 EB Ramp	1030	112	11%
5	I-64 WB to the US 19 NB Exit Ramp	4811	162	7%
6	I-64 EB to the US 19 NB Exit Ramp	1369	97	7%
7	US 19 SB to the I-64 EB Entrance Ramp	4613	163	4%
8	US 19 SB to the I-64 WB Entrance Ramp	1466	117	8%
9	I-64 EB – between Exits 124 and 125 (4 lanes)	11472	1423	12%
10	I-64 WB – between Exits 124 and 125 (3 lanes)	11717	1615	14%
11	I-64 WB to the WV 307 Exit Ramp	1311	115	9%
12	I-64 WB to the WV 307 SB Exit Ramp	2909	93	3%
13	I-64 EB to the WV 307 NB Exit Ramp	2370	170	7%
14	WV 307 to the I-64 EB Entrance Ramp	1282	98	8%
15	WV 307 SB to the I-64 WB Entrance Ramp	2532	204	8%
16	WV 307 NB to the I-64 WB Entrance Ramp	2806	100	4%

Accompanying the ADT data, detailed vehicle classification information was also collected to understand the types and quantities of vehicles traveling through the study area. The classification data for each count location, broken down by 24 hours, is included in the Appendix B. The vehicles were classified as lights, mediums, and articulated trucks. For the purposes of comparison to the FHWA Vehicle Types, lights are Class 1-3, mediums are Class 4-7 and articulated trucks are Class 8-13. Table 3-3 summarizes the truck percentages and Average Daily Truck Traffic (AADT) for each of the count locations. For the purposes of this analysis, mediums and articulated trucks (Class 4-13) were classified as trucks. Overall, truck percentages in the study area range from 3.0% up to 20% at one location. The average number of trucks throughout the entire study area is approximately 10%.

3.3. Crash and Safety Analyses

Crash data were provided for the study area for the period from January 1, 2014 to December 31, 2016. This data was referenced with respect to I-64, US 19 and WV 307. Figure 3-2 provides the crash intensity within the study area. The crash listings by location and crash rate calculations are provided in Appendix C.

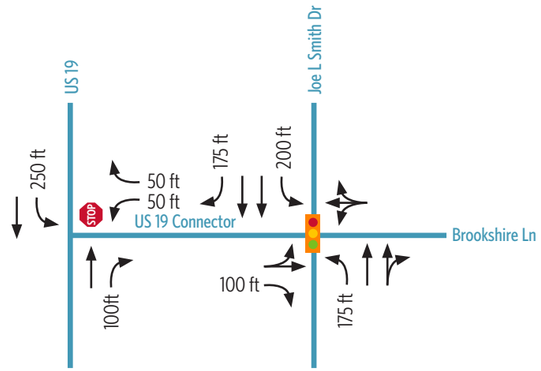
Note that upon inspection of the data it appeared that there were several miscoded (by milepost) records on US-19 and WV 307. On US 19, according to the provided data, there were 105 crashes at the I-64 overpass and 67 crashes near Hedrick Street.

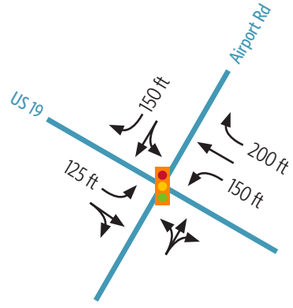
Figure 3-1: Existing Study Area, Geometry, and Peak Hour Volumes

Intersection ID#

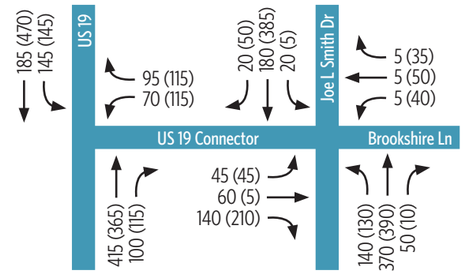
1. US 19 Eisenhower Dr and Brookshire Ln/US 19 Connector
2. Brookshire Ln/US 19 Connector and Joe L. Smith Rd
5. Airport Rd (WV 307) and US 19 Ritter Dr

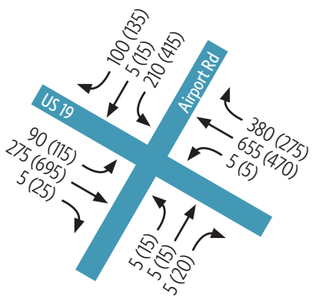
Existing Intersection Geometry





2017 Existing ADT and TMC Volumes



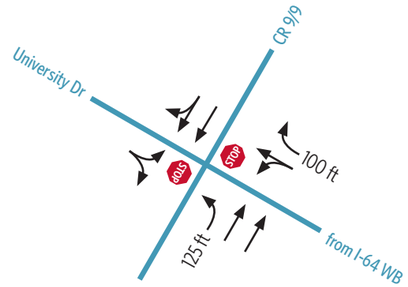
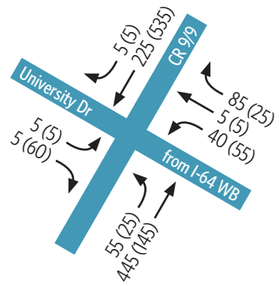
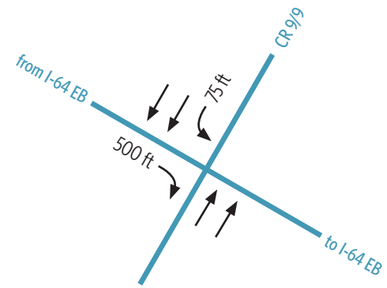
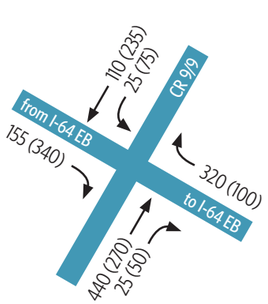
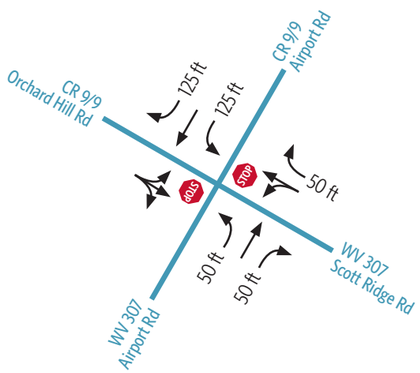
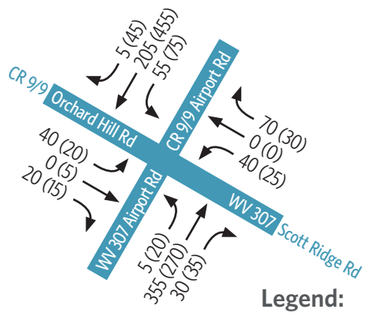


Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

Figure 3-1: Existing Study Area, Geometry, and Peak Hour Volumes

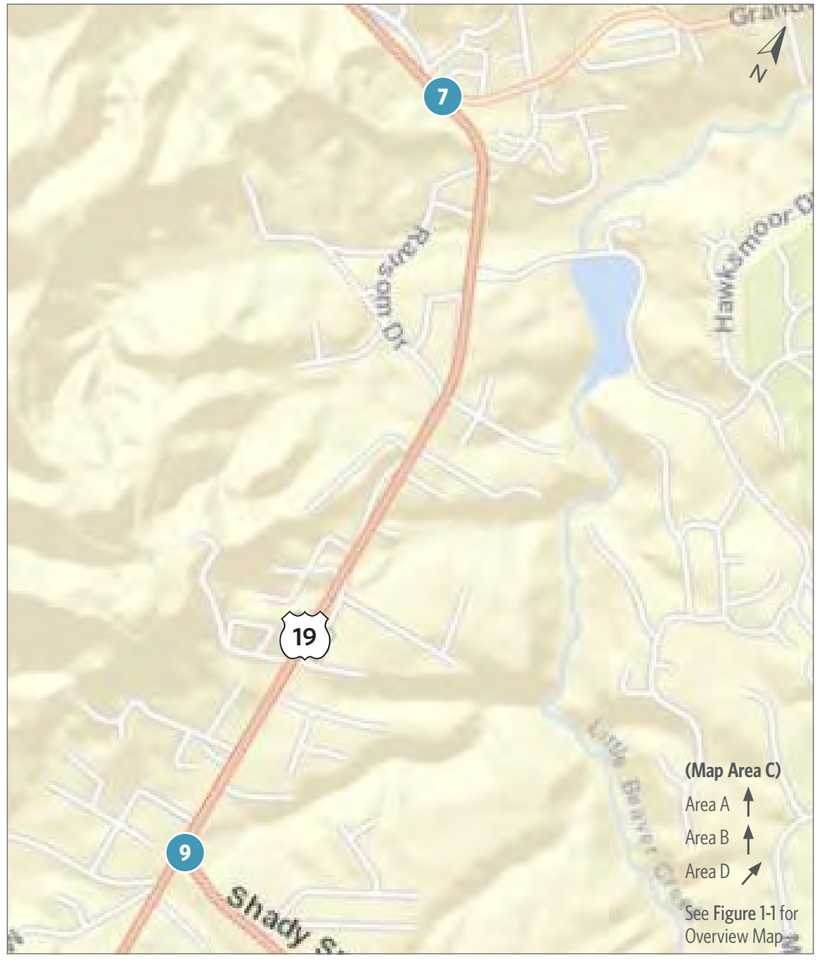
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

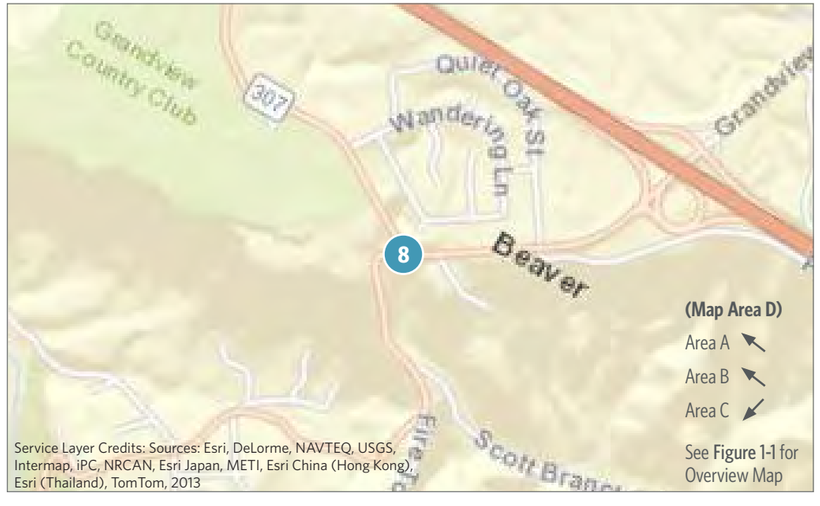
Intersection ID#	Existing Intersection Geometry	2017 Existing ADT and TMC Volumes
3 Airport Rd (CR 9/9) and I-64 WB Ramp/University Dr		
4 Airport Rd (CR 9/9) and I-64 EB Ramp		
6 Airport Rd (CR 9/9 and WV 307) and Scott Ridge Rd (CR 9/9 and WV 307)		

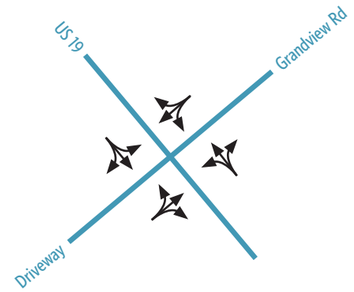
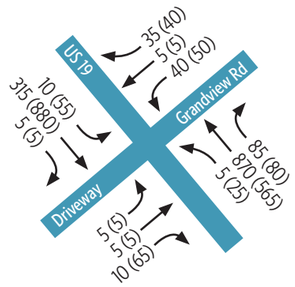
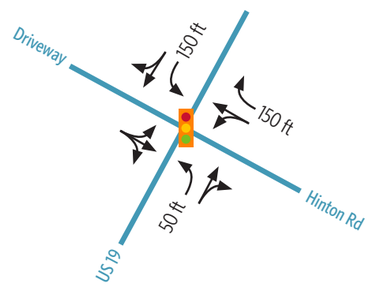
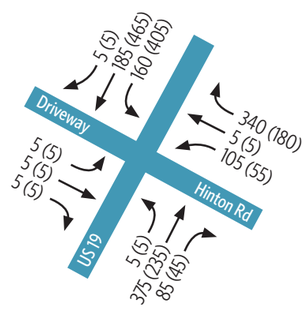
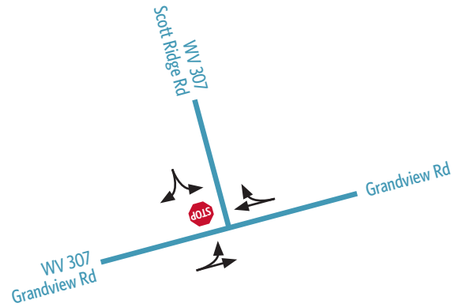
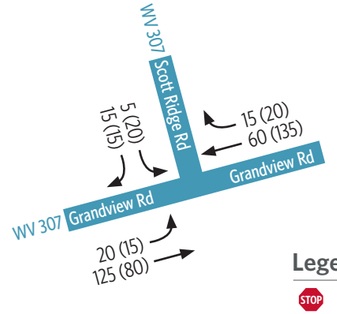
Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

Figure 3-1: Existing Study Area, Geometry, and Peak Hour Volumes



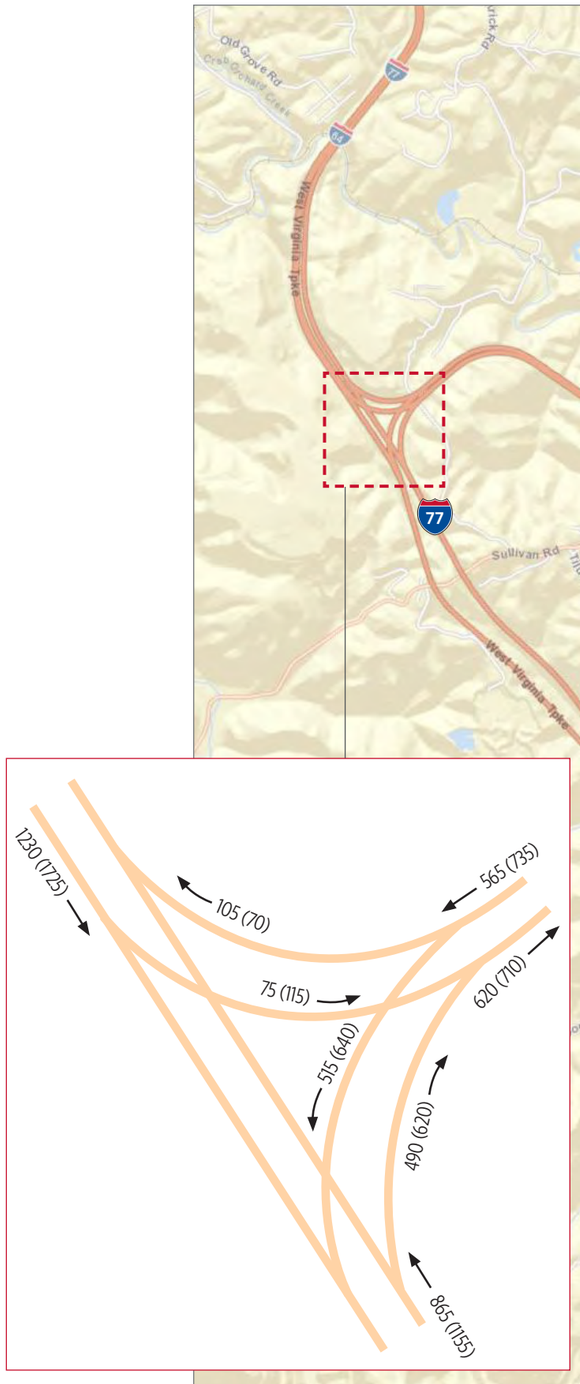


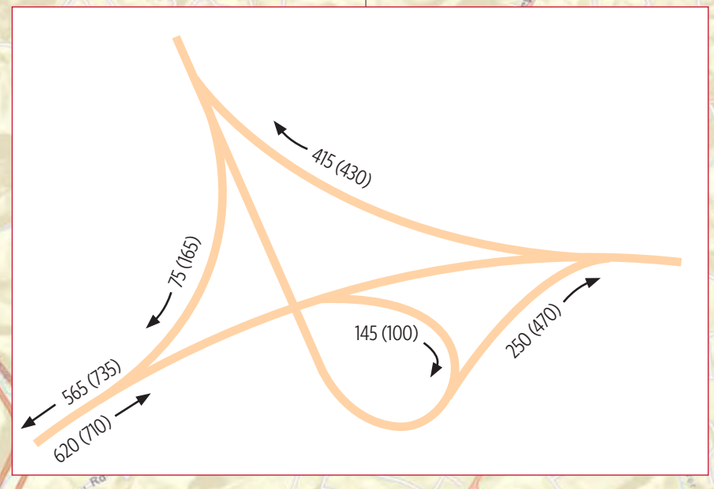
Intersection ID#	Existing Intersection Geometry	2017 Existing ADT and TMC Volumes
7 US 19 Ritter Dr and Grandview Rd (WV 307)/Driveway		
9 US 19 Ritter Dr and Hinton Rd		
8 Grandview Rd (WV 307) and Scott Ridge Rd (WV 307)		

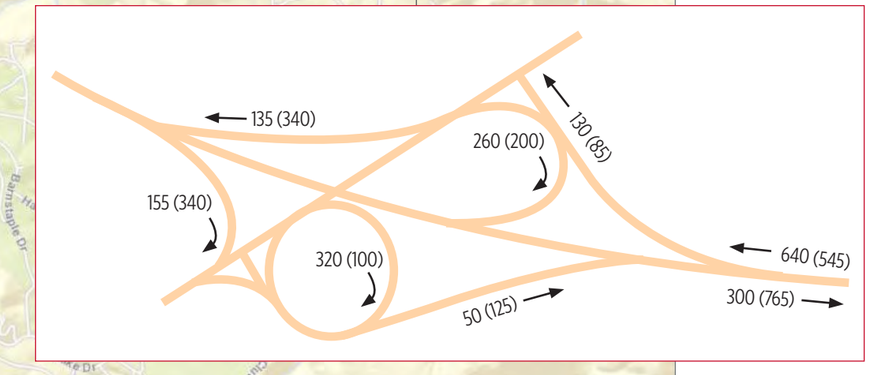
Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

Figure 3-1: Existing Study Area, Geometry, and Peak Hour Volumes







Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Legend:

X (X) AM Peak (PM Peak)

4 2037 No Build and Build Conditions

4.1. 2037 No Build Conditions

To determine the future traffic conditions if no improvements were made, the 2037 No-Build conditions were analyzed quantitatively to measure the future conditions. As described in the Technical Memo for the Travel Demand Model, the future volumes showed a decline in volumes compared to the base year. Therefore, it was decided to use the base volumes for the future analysis, which is more conservative. In turn, the 2037 No-Build Conditions are very similar to the Existing Conditions and reflect similar operational conditions.

4.2. 2037 Build Conditions Proposed Improvements

The 2037 Build conditions assume the construction of the new Z-Way alignment between the I-64 Interchange (Exit 124) and US 19, approximately 1,000 feet south of Airport Road. In addition, US 19 is proposed to be widened between just south of WV 307 (Airport Road) to WV 3 (Hinton Road). Figure 4-1 provides an overview of the study area intersections, including the new intersections formed by the proposed roadway alignment. In conjunction with these major corridor improvements, the following intersections are newly developed or significantly modified:

- I-64 Interchange at Exit 124 - (I/S # 10 & 11)
- Airport Road and Z-Way Connector – (I/S # 12)
- Z-Way and Airport Connector – (I/S # 13)
- US 19 Ritter Drive (Old US 19) and Z-Way – (I/S # 14)
- US 19 and Grandview Road – (I/S # 7)

These intersections were analyzed with Synchro under various build alternatives to determine the intersection configurations. Analysis will test various intersection options, evaluate signal warrants, and identify turn lane requirements.

I-64 Interchange - A jughandle is proposed at the I-64 Eastbound ramp intersection to avoid southbound left turns onto the ramp. The Z-Way will tie into the interchange and construct a separate right turn lane on the northbound approach onto I-64 eastbound. The eastbound ramps will also be signalized. As the I-64 westbound ramp intersection, a four legged intersection will be constructed and signalized to allow left turns to and from the south along US 19. A portion of the existing westbound on-ramp will be eliminated, requiring southbound traffic to make a right at the new intersection.

Airport Road (WV 307) and Z-Way Connector – Although the Z-way will pass over Airport Road, a small connector will provide access, creating two intersections. The intersection on Airport Road will be located at the 84 Lumber driveway and will be unsignalized, and the Z-Way intersection (described next) will also provide access to Whispering Pine Drive.

Z-Way and Airport Road Connector – This four-legged unsignalized intersection with the Z-Way will be constructed to provide access to and from Airport Road by aligning at the intersection with Whispering Pine Drive. Separate left and right-turn lanes will be provided on all approaches.

US 19 Ritter Drive (Old US 19) and Z-Way – US 19 will be realigned to tie into the Z-Way at a 90 degree angle, approximately 1,000 feet south of Airport Road. The intersection will be signalized and provide separate left and right-turn lanes on all approaches

US 19 and Grandview Road (WV 307) - This existing intersection is proposed to be re-aligned to a 90 degree intersection angle, with left turning lanes. The realignment will shift the approach roadway to the west before tying back into the existing pavement. 4.

4.3. Projected Volumes

Traffic forecasts were developed using the following data sources:

- Automatic Traffic Recorders (ATRs) and Turning Movement Counts (TMCs) from the data collection effort in April 2017.
- Average Daily Traffic (ADT) were from the West Virginia DOT Geocounts database http://geocounts.com/traffic/project/1471556443665.
- Fayette-Raleigh Metropolitan Planning Organization (FRMPO) Travel Demand Model (TDM), including associated roadway network and socio-economic (SE) datasets, which reflect current estimates and future projections of regional population, household, and employment levels.

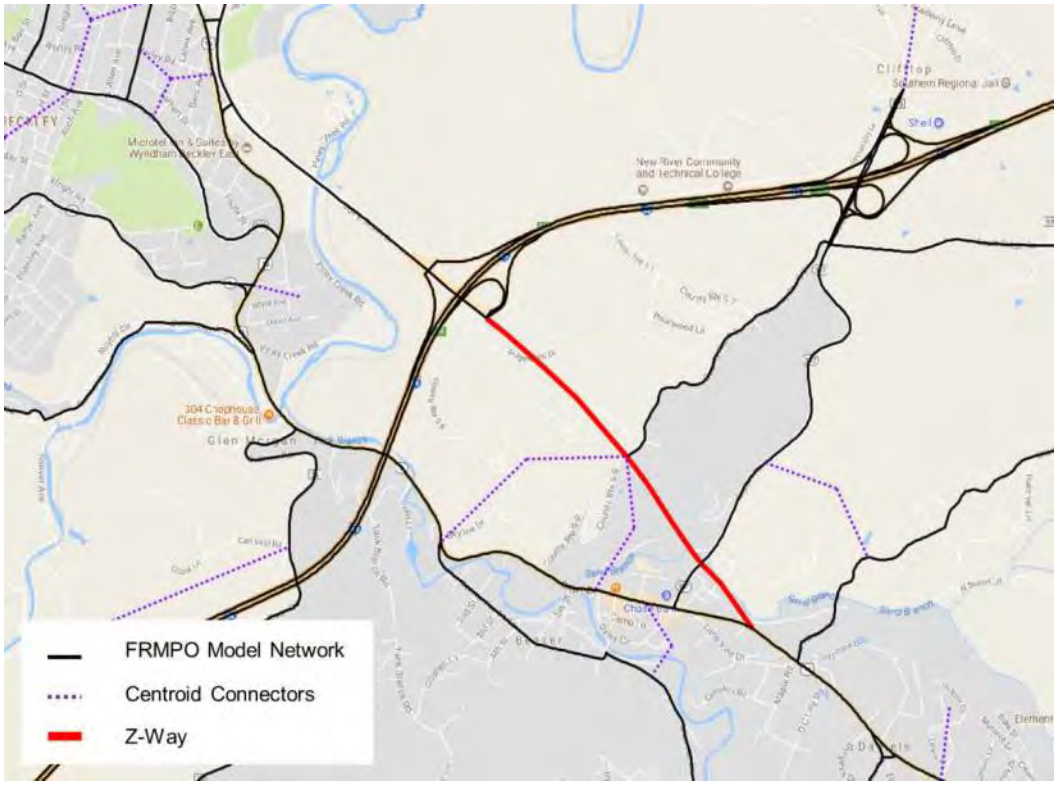
FRMPO Model Output

The FRMPO TDM was used to forecast the change in study area travel patterns and volumes due to construction of the Z-way (the "build network" scenario). The following scenarios were run in TransCAD Version 5.0 software:

- Base Year SE Data (2015) on the Existing Network
  The outputs from this model run was used to post-process future volumes to more accurately estimate future ADTs and TMCs.
- Future Year SE Data (2040) on the Existing Network
- Base Year SE Data (2015) on the Build Network
  The build network utilized the latest information available on location of new turn lanes, access point locations, and general project alignment.
- Future Year SE Data (2040) on the Build Network

The roadway network detail provided by the FRMPO TDM, and the roadway network coding for the Build and Existing network is shown in Figure 4.1. The Build scenario includes the Z-way connection (shown in **RED**) between I-64 and US-19/WV 3. The model network coverage is also shown in Exhibit 4.1.

Exhibit 4-1: FRMPO Model Roadway Network



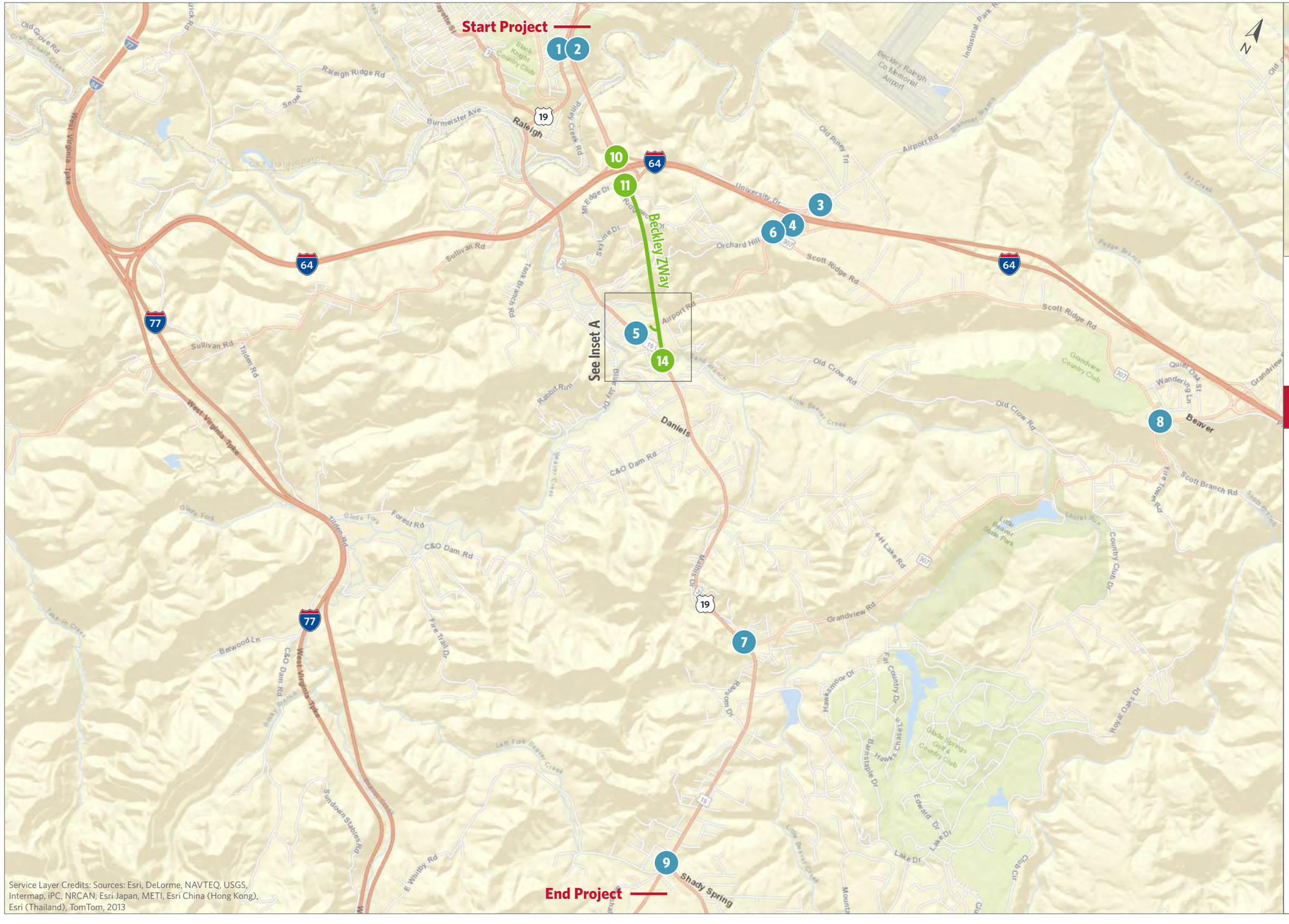
The Base Year and 2040 SE data were run on the Build network to test the sensitivity between the existing and future growth on the roadway network. A majority of the network southeast of I-64 showed declines in traffic volumes in 2040 compared to the base year traffic volumes, due to projected declines in regional population and housing between the base year and future 2040 scenario. Traffic volumes along the freeways and northwest of I-64 near downtown Beckley showed some growth.

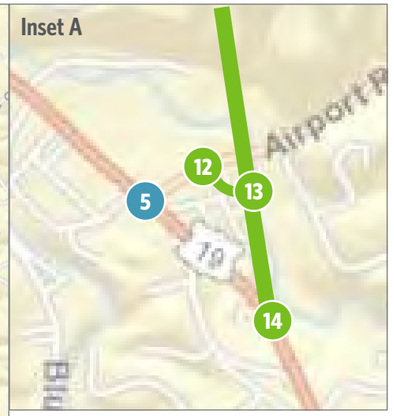
It was determined that in order to estimate a “worst-case” scenario, the base year SE data should be utilized. To account for the traffic growth along the freeways and northwest of I-64, a 0.5% per year growth rate was applied to ADTs forecasted by the TDM for the existing Build condition. The 2037 Build volumes for the AM and PM peak period are shown on Figure 4.2 (Sheets 1-5).

4.4. Left Turn Lane Analyses

Left-turn lanes are provided along the Beckley Z-Way at each major intersection either as a marked exclusive left-turn lane or through the use of the TWLTL which runs the length of the corridor. US 19 will be also be widened from 2 lanes to 3 lanes between WV 307 (Airport Road) and WV 3 (Hinton Road) and will provide a TWLTL along the length of this segment, with separate left-turn and right-turn lanes at major

Figure 4-1: Build Intersection Locations Overview Map





Legend:

- 1 Intersection ID Number
- 10 ZWay Intersection ID Number

Build Intersection Locations

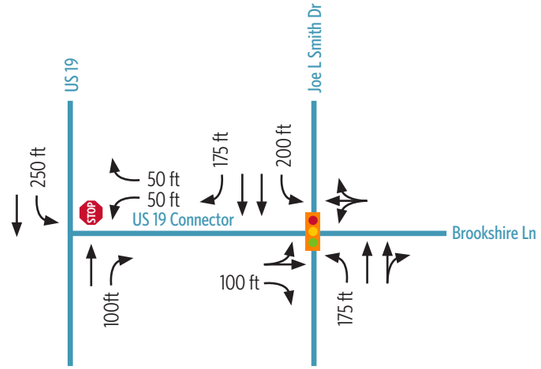
1. US 19 Eisenhower Dr and Brookshire Ln/ US 19 Connector
2. Brookshire Ln/US 19 Connector and Joe L. Smith Rd
3. Airport Rd (CR 9/9) and I-64 WB Ramp/ University Dr
4. Airport Rd (CR 9/9) and I-64 EB Ramp
5. Airport Rd (WV 307) and US 19 Ritter Dr
6. Airport Rd (CR 9/9 and WV 307) and Scott Ridge Rd (CR 9/9 and WV 307)
7. US 19 Ritter Dr and Grandview Rd (WV 307)/ Driveway
8. Grandview Rd (WV 307) and Scott Ridge Rd (WV 307)
9. US 19 Ritter Dr and Hinton Rd
10. I-64 WB Ramps and ZWay
11. I-64 EB Ramps and ZWay
12. Airport Rd and ZWay Connector
13. Airport Connector/CR 61/62 and ZWay
14. US 19 Ritter Dr (Old US 19) and ZWay

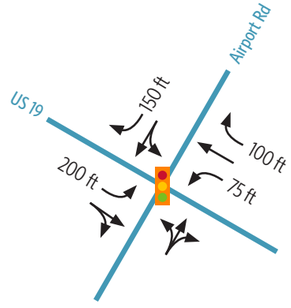
Figure 4-2: Build Study Area, Geometry, and Peak Hour Volumes

Intersection ID#

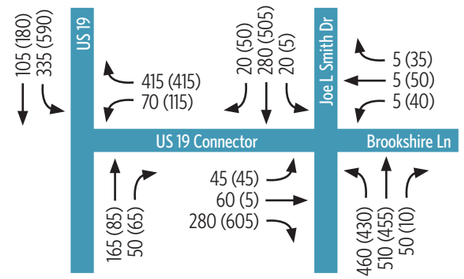
1. US 19 Eisenhower Dr and Brookshire Ln/US 19 Connector
2. Brookshire Ln/US 19 Connector and Joe L. Smith Rd
5. Airport Rd (WV 307) and US 19 Ritter Dr

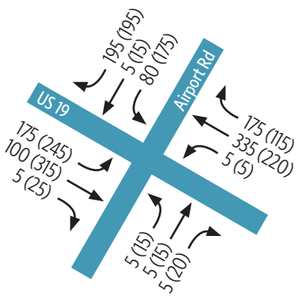
Build Intersection Geometry





2017 Build ADT and TMC Volumes

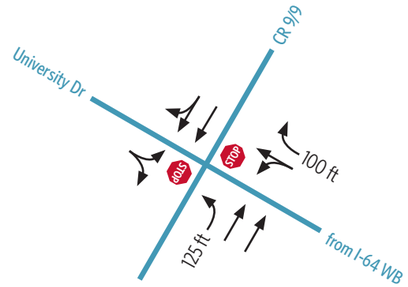
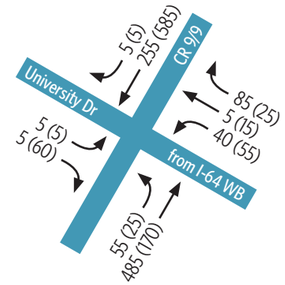
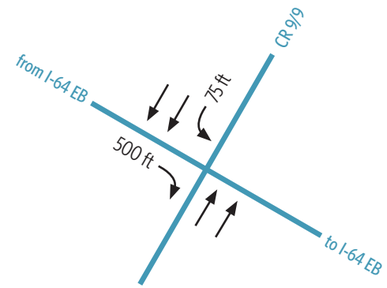
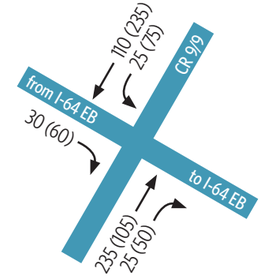
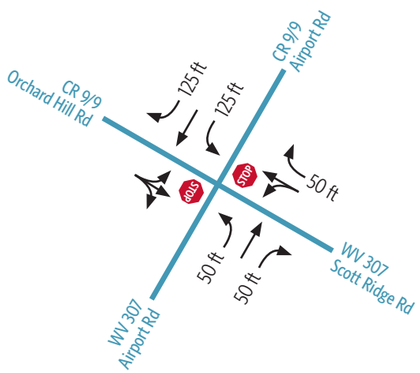
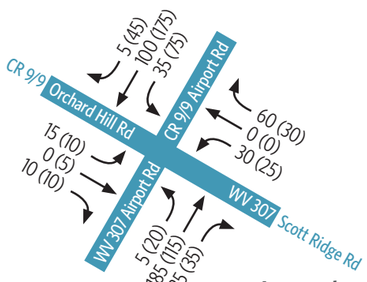




Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

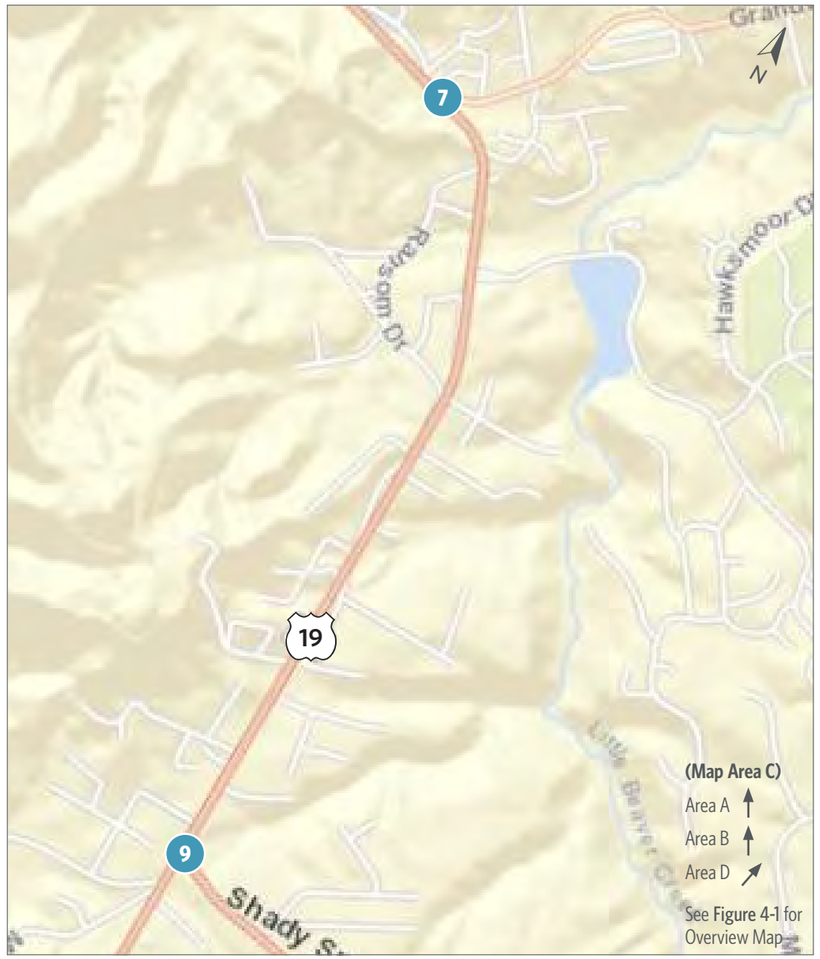
Figure 4-2: Build Study Area, Geometry, and Peak Hour Volumes

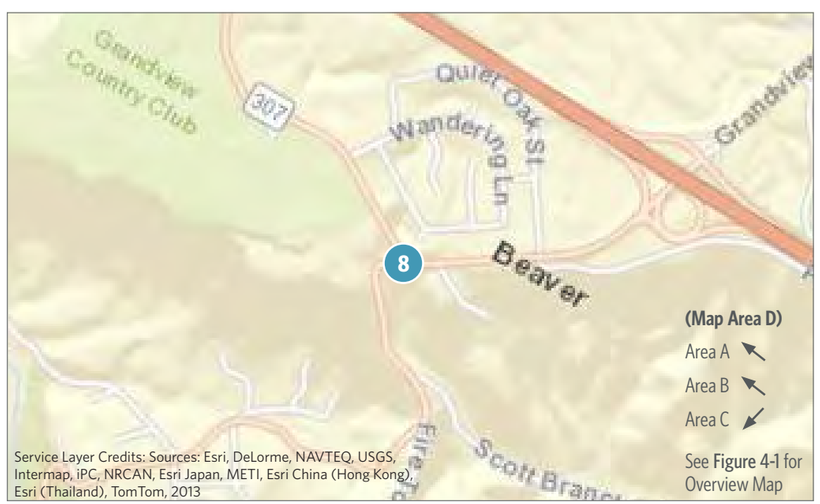
Intersection ID#	Build Intersection Geometry	2017 Build ADT and TMC Volumes
3 Airport Rd (CR 9/9) and I-64 WB Ramp/University Dr		
4 Airport Rd (CR 9/9) and I-64 EB Ramp		
6 Airport Rd (CR 9/9 and WV 307) and Scott Ridge Rd (CR 9/9 and WV 307)		

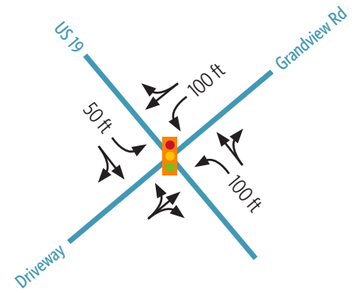
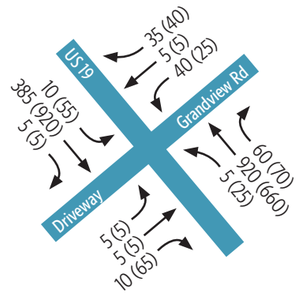
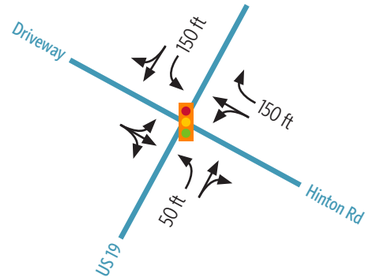
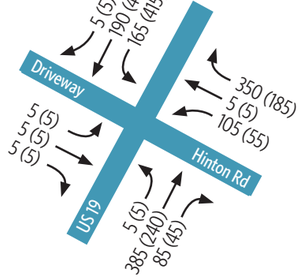
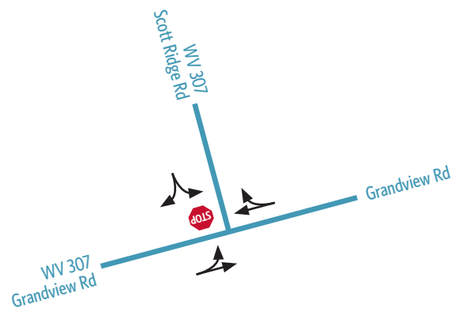
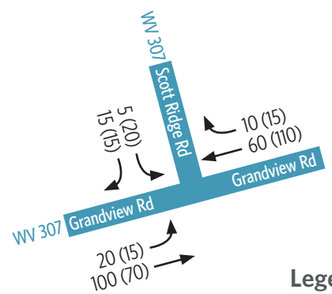
Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

Figure 4-2: Build Study Area, Geometry, and Peak Hour Volumes





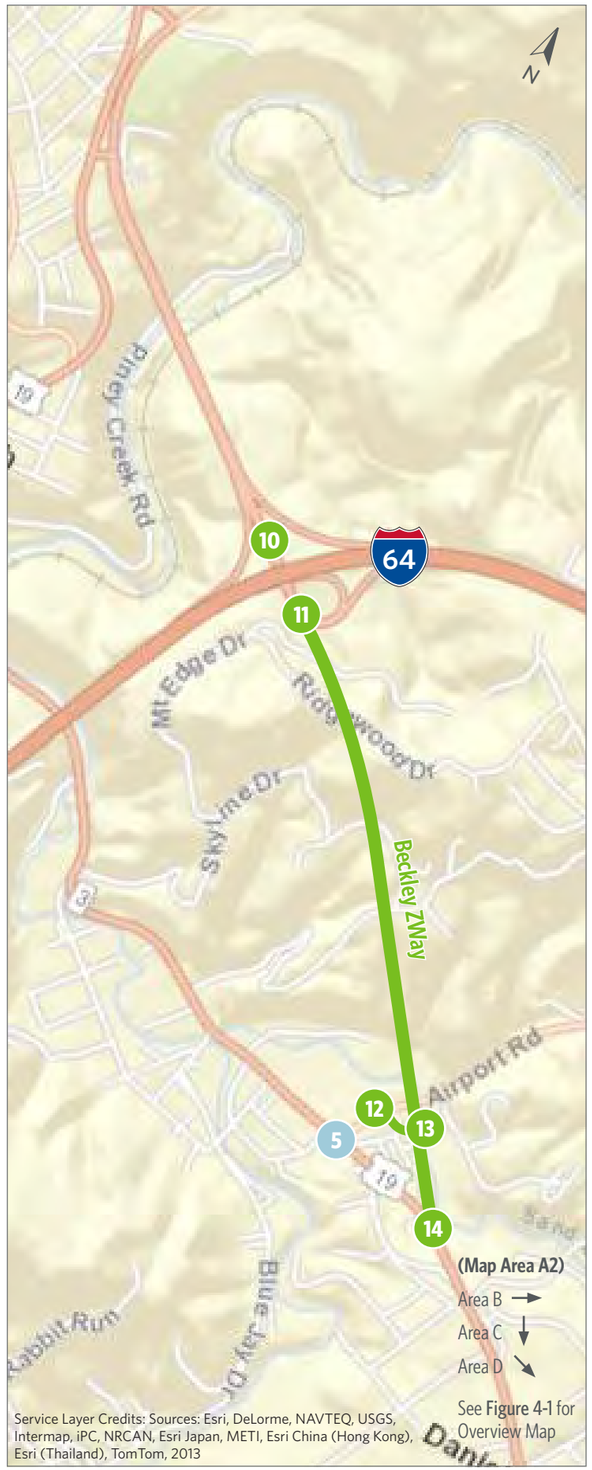
Intersection ID#	Build Intersection Geometry	2017 Build ADT and TMC Volumes
7 US 19 Ritter Dr and Grandview Rd (WV 307)/Driveway		
9 US 19 Ritter Dr and Hinton Rd		
8 Grandview Rd (WV 307) and Scott Ridge Rd (WV 307)		

Legend:

- STOP Stop Sign
- Traffic Signal
- 1 Intersection ID Number
- X (X) AM Peak (PM Peak)

BEAVER-SOUTH EISENHOWER DRIVE - Raleigh County, WV **State Project Number:** X341-ZWA/Y-6.22 02 - **Federal Project Number:** STP-0019(429)D

Figure 4-2: Build Study Area, Geometry, and Peak Hour Volumes

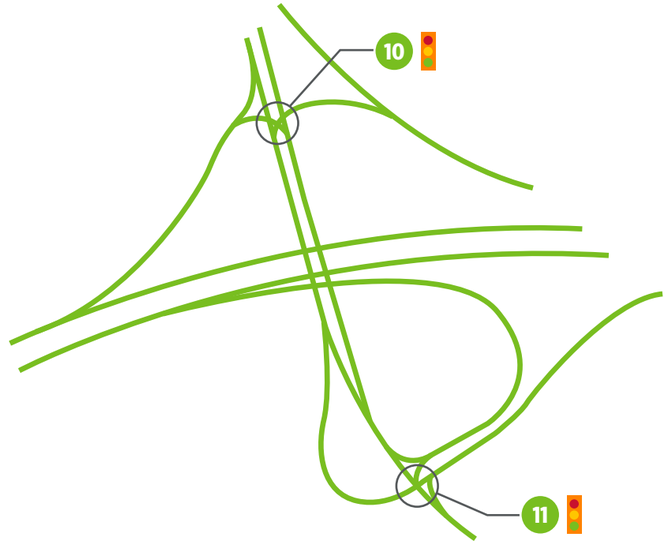


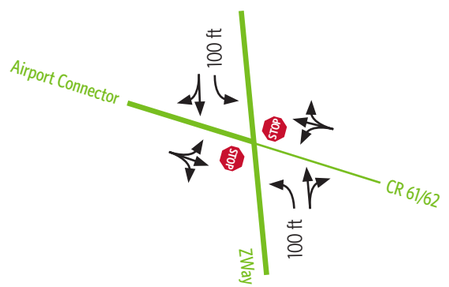
Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

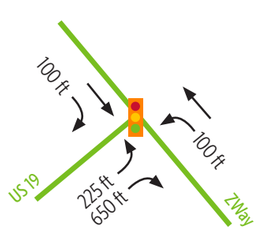
Intersection ID#

- **10** I-64 WB Ramps and ZWay
- **11** I-64 EB Ramps and ZWay
- **12** Airport Rd and ZWay Connector
- **13** Airport Connector/CR 61/62 and ZWay
- **14** US 19 Ritter Dr (Old US 19) and ZWay

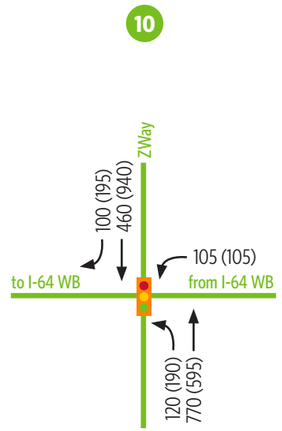
Build Intersection Geometry

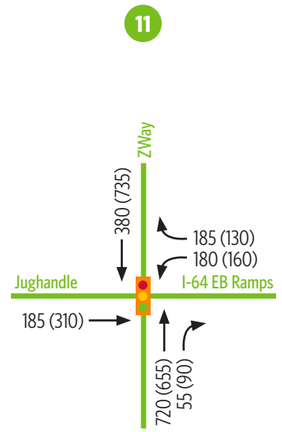


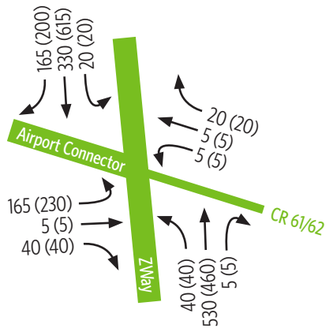




2017 Build ADT and TMC Volumes



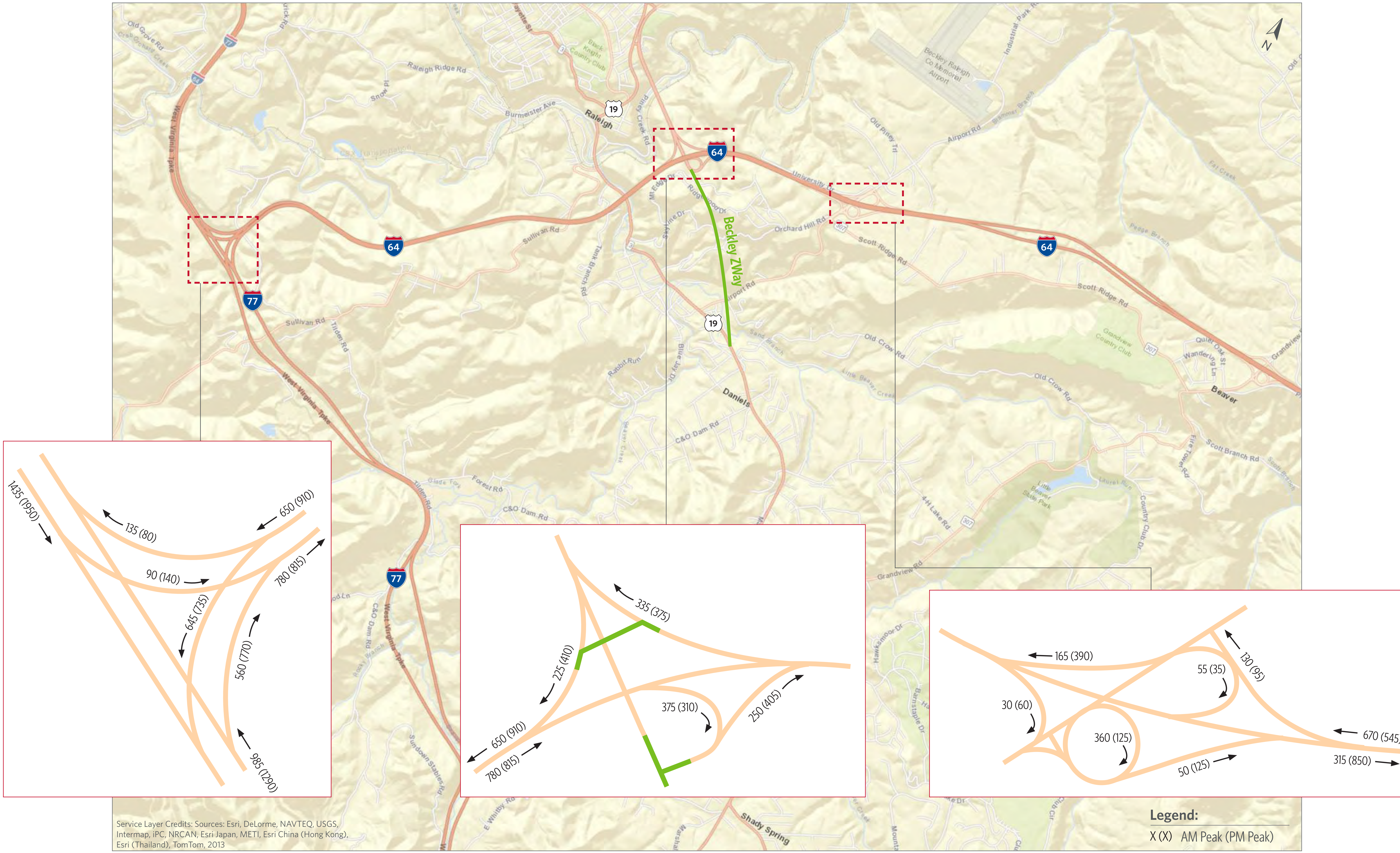




Legend:

- STOP Stop Sign
- Traffic Signal
- **10** ZWay Intersection ID Number
- X (X) AM Peak (PM Peak)

Figure 4-2: Build Study Area, Geometry, and Peak Hour Volumes



Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Legend:
X (X) AM Peak (PM Peak)

APPENDIX E -
NOISE BARRIER EVALUATION FORM

NOISE BARRIER EVALUATION FORM

Proposed Project: Beaver to South Eisenhower Drive (Buckley Z-Way)
Location: CNE G (150 Lilly Trail)

FEASIBILITY

Can a 5 dBA noise reduction be achieved at any impacted receptors? Yes

If yes complete the reasonableness section.
If no, a noise barrier should not be constructed. No additional analysis is required.

REASONABLENESS

	Not Reasonable	Marginally Reasonable	Fully Reasonable	Highly Reasonable
REQUIRED FACTORS: *				
1. % of benefited receptors wanting barrier	<50%	50-60%	61-75%	>75%
2. cost/receptor	>$30K	$26K-$30K	$20K-$25K	<$20K
3. % of benefited receptors with 7 dBA noise reduction	<10%	10%-20%	21%-40%	>40%
OPTIONAL FACTORS: **				
4. % developed before public knowledge of proposed project	<20%	20%-30%	31%-40%	>40%
5. % developed before highway constructed	<20%	20%-30%	31%-40%	>40%
6. Build level ___ dBA Greater than existing	<3dBA	3-4	5-10	>10
7. Build level ___ dBA Greater than no-build	<2dBA	2	3-5	>5
8. Build level above Noise abatement criteria	not applicable	not applicable	0-3 dBA above	> 3 dBA above

9. ADDITIONAL CONSIDERATIONS: _____

DECISION AND REASONS: _____

* 23 CFR 772.13(d)(2)(iv) requires that reasonableness factors 1-3 must each be achieved for a noise abatement measure to be considered reasonable.

** 23 CFR 772.13(d)(2)(iv) allows consideration of these optional abatement factors, which cannot singly eliminate an abatement measure that meets the requirements of 1-3 above.

APPENDIX F -
TNM FILES (FTP LINK)

APPENDIX F TNM FILES

All TNM models created for the Beaver to South Eisenhower Drive (Beckley Z-Way) project including 2017 Validation, 2017 PM Peak Hour Existing Conditions and 2037 PM Peak Hour Design Build can be downloaded from:

http://www.skellyloy-gis.com/downloads/Beckley Z-Way (Beaver to S Eisenhower) TNM files.zip