TRAFFIC NOISE REPORT

Proposed Widening of I-26 from US 25 south of Hendersonville to I-40 near Asheville

STIP Project I-4400/I-4700
Henderson and Buncombe Counties

Prepared for:

North Carolina Department of Transportation
Environmental Analysis Unit
Traffic Noise & Air Quality Group

Prepared by:

HNTB North Carolina, P.C.

July 2017

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EXECUTIVE SUMMARY

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program (STIP) Project I-4400/I-4700 proposes improvements to a 22.2-mile segment of the Interstate 26 corridor in Henderson and Buncombe Counties. The proposed improvement project would extend from US 25 south of Hendersonville in Henderson County to I-40 near Asheville in Buncombe County. With its current traffic demand, I-26 is approaching its ultimate capacity. The purpose of the proposed improvements to I-26 is to reduce congestion, with a goal of achieving an overall level of service (LOS) D in the design year (2040), and improve the pavement structure.

A federal Environmental Impact Statement is being prepared. The Date of Public Knowledge will be the approval date of the Record of Decision. After this date, federal and state governments are no longer responsible for providing noise abatement measures for new development within the noise impact area of the proposed project. NCDOT advocates use of local government authority to regulate land development, planning, design and construction in such a way that noise impacts are minimized.

This Traffic Noise Report (TNR) documents the methodologies, results, and recommendations in compliance with FHWA 23 CFR 772 *Procedures for Abatement of Highway Traffic Noise and Construction Noise,* the 2016 NCDOT *Traffic Noise Policy* (NCDOT Policy), and the accompanying 2016 NCDOT *Traffic Noise Manual*. Per FHWA 23 CFR 772.5(2) and NCDOT Policy, the proposed project is a “Type I” project.

I-26 is currently a four (4)-lane, median-divided interstate facility with full control of access. The project area includes 11 existing grade-separated crossings and seven (7) existing interchanges. In Henderson County, I-26 has interchanges with US 25, Upward Road (SR 1722), US 64 (Four Seasons Boulevard/Chimney Rock Highway), US 25 (Asheville Highway), and NC 280 (Airport Road), which is partially located in Buncombe County as well. In Buncombe County, I-26 also has interchanges with NC 146 (Long Shoals Road) and NC 191 (Brevard Road). The Blue Ridge Parkway has a grade-separated crossing, but no direct access to I-26. The speed limit of I-26 varies from 65 miles per hour (mph) in southern Henderson County to 60 mph in northern Henderson County and Buncombe County. The design speeds for these segments of the I-26 corridor are 70 and 65 miles per hour respectively, five (5) miles per hour above the posted speeds. The design year is 2040.

The preferred alternative is the Hybrid 6/8-Lane Widening Alternative. The Hybrid 6/8-Lane Widening Alternative would widen I-26 to a six (6)-lane facility with three (3) lanes in each direction from the eastern terminus of the project study area (US 25 [Exit 54]) to the I-26/US 25 (Asheville Highway) interchange where it would then transition to an eight (8)-lane facility with four (4) lanes in each direction and continue to the western terminus south of the I-26/I-40/I-240 interchange (Exit 31). This alternative would be situated to best fit within the existing right of way limits for I-26. Best fit alignments would be evaluated and selected to improve the existing highway alignment, minimize impacts, and accommodate maintenance of traffic during construction. The additional traffic lanes would increase capacity and reduce congestion.

Traffic noise impacts and temporary construction noise impacts can be a consequence of transportation projects, especially for noise-sensitive land uses in close proximity to high-volume and/or high-speed existing steady-state traffic noise sources. This TNR utilized computer models created with the Federal Highway Administration Traffic Noise Model® (FHWA TNM v.2.5) to determine existing and to predict future noise levels and identify impacted receptors resulting from the I-26 Widening project.

Existing land use in the vicinity of the I-26 widening project varies along the corridor. Land uses include but are not limited to single and multi-family residential dwellings, active sports areas, campgrounds, medical facilities, places of worship, recreation areas, trails, hotels, offices, restaurants, airports, industrial and manufacturing facilities, and retail facilities. Some areas of the corridor include undeveloped lands where no permits for development have been issued, and there is a protected land use near the Blue Ridge Parkway grade separation. In the vicinity of the I-4400/I-4700 project, Base Year 2011 and No-Build 2040 traffic noise approaches or exceeds FHWA Noise Abatement Criteria (NAC) for 261 and 298 receptors respectively. For Design Year 2040 traffic volumes, the Hybrid 6/8-Lane Widening Alternative is predicted to result in 399 traffic noise impacts.

Consideration of noise abatement measures was given to all impacted receptors for the Hybrid 6/8-Lane Widening Alternative. NCDOT Policy requires the identification of whether it is “likely” or “unlikely” that noise abatement measures will be provided for each noise study area identified. “Likely” does not mean a firm commitment. The following noise abatement measures are currently considered to be “likely” in the vicinity of the I-26 Widening project:

Hybrid 6/8-Lane Widening Alternative

NW2.3: Located south of Dana Road along I-26 westbound and provides abatement for residences along Willowbrook Road and Springside Drive.

NW4.1: Located north and south of Brookside Camp Road along I-26 westbound and provides abatement for residences along Hart Lane, Wendy Lane, Carolina Circle, Dundeve Circle and Acorn Drive.

NW4.6: Located along the I-26 westbound off ramp at the US 25 (Asheville Highway) interchange and provides abatement for residences along November Lane and Hickory Flats Drive.

NW5.3: Located north of Butler Bridge Road along I-26 westbound and provides abatement for residences along Hope Opal Lane, S. Thomas Street and Jim Mills Drive.

NW9.3: Located south of Glenn Bridge Road along I-26 eastbound and provides abatement for residences along Hidden Creek Drive, Nathan Drive and Wells Drive.

NW13.2: Located south of Dana Road along I-26 eastbound and provides abatement for residences along Meadowlark Lane.

Construction noise impacts may occur due to the proximity of noise-sensitive land uses to project construction activities. All reasonable efforts should be made to minimize exposure of noise-sensitive land uses to construction noise. Such efforts may include, but are not limited to, appropriate scheduling of construction activities, noise attenuating measures on construction equipment, and a consistent and open public involvement program.

This TNR presents a preliminary design noise analysis of all traffic noise impacts and consideration of noise abatement measures for feasibility and reasonableness in accordance with the NCDOT *Traffic Noise Policy* (October 6, 2016). Once the final project design is available, a final decision on feasibility and reasonableness will be made upon completion of a Design Noise Report (DNR) and its acceptance by NCDOT and FHWA, as well as the public involvement process. Reasonableness criteria outlined in Section 11.3 of the 2016 NCDOT *Traffic Noise Manual* include the solicitation of property owners' and tenants' preferences for all receptors potentially benefited by noise abatement measures. This is done through a vote with weighted ballots, as described in Section 11.3.1.

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I-26 Widening Project
Henderson and Buncombe Counties, STIP #I-4400/I-4700

1.0 PROJECT LOCATION AND DESCRIPTION

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program (STIP) Project I-4400/I-4700 proposes improvements to a 22.2-mile segment of the Interstate 26 corridor in Henderson and Buncombe Counties. The proposed improvement project would extend from US 25 south of Hendersonville in Henderson County to I-40 near Asheville in Buncombe County. With its current traffic demand, I-26 is approaching capacity. The purpose of the proposed improvements to I-26 is to reduce congestion, with a goal of achieving an overall level of service (LOS) D in the design year (2040), and improve the pavement structure.

I-26 is currently a four (4)-lane, median-divided interstate facility with full control of access. The project area includes 11 existing grade-separated crossings and seven (7) existing interchanges. In Henderson County, I-26 has interchanges with US 25, Upward Road (SR 1722), US 64 (Four Seasons Boulevard/Chimney Rock Highway), US 25 (Asheville Highway), and NC 280 (Airport Road), which is partially located in Buncombe County as well. In Buncombe County, I-26 also has interchanges with NC 146 (Long Shoals Road) and NC 191 (Brevard Road). The Blue Ridge Parkway has a grade-separated crossing, but no direct access to I-26. The speed limit of I-26 varies from 65 miles per hour (mph) in southern Henderson County to 60 mph in northern Henderson County and Buncombe County. The design speeds for these segments of the I-26 corridor are 70 and 65 miles per hour respectively, five (5) miles per hour above the posted speeds. The design year is 2040.

The Preferred Alternative is the Hybrid 6/8-Lane Widening Alternative. The Hybrid 6/8-Lane Widening Alternative would widen I-26 to a six (6)-lane facility with three (3) lanes in each direction from the eastern terminus of the project study area (US 25 [Exit 54]) to the I-26/US 25 (Asheville Highway) (Exit 44) interchange where it would then transition to an eight (8)-lane facility with four (4) lanes in each direction and continue to the western terminus south of the I-26/I-40/I-240 interchange (Exit 31). This alternative also includes two proposed interchange modifications. The existing full cloverleaf interchange at US 64 (Four Seasons Boulevard/ Chimney Rock Highway) would be modified to a partial cloverleaf design. The existing traditional diamond interchange at US 25 (Asheville Highway) would be converted into a diverging diamond interchange. This alternative would be situated to best fit within the existing right of way limits for I-26. Best fit alignments would be evaluated and selected to improve the existing highway alignment, minimize impacts, and accommodate maintenance of traffic during construction. The additional traffic lanes would increase capacity and reduce congestion.

Existing land use in the vicinity of the I-26 widening project varies along the corridor. Land uses include but are not limited to single and multi-family residential dwellings, active sports areas, campgrounds, medical facilities, places of worship, recreation areas, hotels, offices, restaurants, airports, industrial and manufacturing facilities, and retail facilities. Some areas of the corridor include undeveloped lands where no permits for development have been issued, and there is a protected land use near the Blue Ridge Parkway grade separation.

For the purpose of this TNR, the project area was divided into 14 Noise Study Areas (NSAs), generally defined by the interchanges located along the I-26 corridor, to group receptors influenced by similar noise sources. The NSAs are defined as follows:

NSA 1: East of I-26: Begin Project (US 25 interchange) to Upward Road interchange
NSA 2: East of I-26: Upward Road interchange to US 64 interchange
NSA 3: East of I-26: US 64 interchange to North of Clear Creek Road
NSA 4: East of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange
NSA 5: East of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange
NSA 6: East of I-26: NC 280 interchange to NC 146 interchange
NSA 7: East of I-26: NC 146 interchange to End Project (near Pond Road)
NSA 8: West of I-26: NC 146 interchange to End Project (near Pond Road)
NSA 9: West of I-26: NC 280 interchange to NC 146 interchange
NSA 10: West of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange
NSA 11: West of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange
NSA 12: West of I-26: US 64 interchange to North of Clear Creek Road
NSA 13: West of I-26: Upward Road interchange to US 64 interchange
NSA 14: West of I-26: Begin Project (US 25 interchange) to Upward Road interchange

Relocations were identified based on proposed right-of-way in the functional design and engineering judgment. It was assumed that the properties identified below will be relocated as a result of the I-4400/I-4700 project for the Hybrid 6/8-Lane Widening Alternative. If additional or different relocations are identified as a part of the project's final design, the "likely" noise abatement measures identified in this TNR should be re-evaluated.

- 46 Hope Opal Lane (R-379)
- 38 Hope Opal Lane (R-380)
- 8 Pine Lane (R-636)
- 10 Pine Lane (R-637)
- 12 Pine Lane (R-638)
- 50 Pine Lane (R-643)

In accordance with the 2011 NCDOT *Traffic Noise Abatement Policy* and the accompanying 2011 NCDOT *Traffic Noise Analysis and Abatement Manual*, a Traffic Noise Analysis (TNA) was previously completed for the I-4400/I-4700 project in April 2015, which evaluated three (3) build alternatives. A subsequent Traffic Noise Analysis Addendum was completed in February 2016 to evaluate a partial cloverleaf design at the I-26 interchange with US 25 (Asheville Highway) for each of the three (3) build alternatives. This TNR serves as an update to all previous traffic noise analyses for the I-4400/I-4700 project in compliance with the 2016 NCDOT *Traffic Noise Policy* (NCDOT Policy) and accompanying 2016 NCDOT *Traffic Noise Manual*. Additionally, one noise wall analyzed in the April 2015 TNA was not re-evaluated in this TNR because it is being constructed under the I-5504 project. The DNR for the I-5504 project was completed in September 2015. A subsequent DNR Addendum was prepared for the I-5504 project by RS&H Architects-Engineers-Planners, Inc. in January 2017.

Ambient noise monitoring data, corresponding traffic count data, photographs, event logs, and field sketches were obtained throughout the project corridor during June 2, 2014 through June 5, 2014 as part of the April 2015 TNA and were incorporated into this TNR in compliance with the 2016 NCDOT Policy. Weather conditions varied between sunny and mostly cloudy and wind speeds were calm to five (5) miles per hour. There was no precipitation. Information on the ambient noise monitoring data can be found in Appendix A.

2.0 PROCEDURE

This TNR represents the analysis of the probable traffic noise impacts and the identification of "likely" noise abatement measures in the vicinity of the I-26 Widening project.

This analysis is consistent with Title 23 Code of Federal Regulations, Part 772, U.S. Department of Transportation, Federal Highway Administration (FHWA), *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, the NCDOT *Traffic Noise Policy*, dated October 6, 2016, and the accompanying 2016 NCDOT *Traffic Noise Manual*.

This TNR utilized validated computer models created with FHWA's Traffic Noise Model® (FHWA TNM v.2.5) to predict Base Year 2011, Design Year 2040 No-Build, and Design Year 2040 Build hourly-equivalent traffic noise levels ($L_{eq(h)}$) to identify impacted receptors in the vicinity of the I-26 Widening project.

In addition to reporting, the procedure by which this TNR was conducted was as follows:

- *Initial project scoping*: Obtain project preliminary design; review project mapping, GIS data, aerial photography, traffic data, and other available pertinent information.

- *Monitoring / fieldwork*: Obtain ambient noise monitoring data; obtain weather data for ambient noise monitoring sessions; create field data logs and site sketches; photograph noise monitoring locations and other relevant visual data; process ambient noise monitoring data (refer to Section 5.0). Noise monitoring and fieldwork was completed as part of the April 2015 TNA and has been incorporated into this TNR as it complies with the 2016 NCDOT Policy.

- *Baseline TNM model*: Identify all land uses, addresses, and locations of all noise sensitive receptors within the project corridor; create a comprehensive, but efficient, TNM model representation of the existing condition project corridor utilizing receptors, roadways, terrain lines, ground zones, barriers (to represent structures), and tree zones; validate the baseline TNM model at all ambient noise monitoring locations for which traffic noise was dominant (refer to Section 5.0); process traffic forecast data into three (3) TNM-designated vehicle classifications; add the project preliminary design to the baseline TNM model. Refer to Appendix C for general descriptions of the TNM model(s) and a description of the TNM model validation process. Baseline TNM models and TNM model validation from the April 2015 TNA have been incorporated into this TNR.

- *Impact assessment*: Input Design Year 2040 Build condition traffic volumes and speeds into the validated baseline TNM model(s); calculate and document TNM-predicted traffic noise levels; evaluate loudest hourly-equivalent noise levels; assess predicted traffic noise NAC and Substantial Increase impacts (refer to Section 7.0 and Appendix A).

- *Noise barrier analysis*: Identify areas in the vicinity of predicted Design Year 2040 traffic noise impacts for which abatement may be feasible; model traffic noise walls; calculate TNM-predicted with-barrier traffic noise levels; evaluate with-barrier noise level reductions (NLRs); and optimize potential noise walls (refer to Section 8.5, and Appendix D).

3.0 CHARACTERISTICS OF NOISE

Noise is basically defined as unwanted sound. It is emitted from many natural and man-made sources. Highway traffic noise is usually a composite of noises from engine exhaust, drive train, and tire-roadway interaction.

The magnitude of noise is usually described by a ratio of its sound pressure to a reference sound pressure, typically twenty micro-Pascals (20µPa). Since the range of sound pressure ratios varies greatly – over many orders of magnitude, a base-10 logarithmic scale is used to express sound levels in dimensionless units of decibels (dB). The commonly accepted limits of detectable human hearing sound magnitudes are between the threshold of hearing at 0 decibels and the threshold of pain at 140 decibels.

Sound frequencies are reported in units of Hertz (Hz), which correspond to the number of vibrations per second of a given tone. A cumulative ‘sound level’ is equivalent to 10 times the base-10 logarithm of the ratio of the sum of the sound pressures of all frequencies to the reference sound pressure. To simplify the mathematical process of determining sound levels, sound frequencies are grouped into ranges, or ‘bands.’ Sound levels are then calculated by adding the cumulative sound pressure levels within each band, which are typically defined as one (1) ‘octave’ or ‘1/3 octave’ of the sound frequency spectrum.

The commonly accepted limitation of human hearing to detect sound frequencies is between 20 Hz and 20,000 Hz, and human hearing is most sensitive to the frequencies between 1,000 Hz – 6,000 Hz. Although people are generally not as sensitive to lower-frequency sounds as they are to higher frequencies, most people lose the ability to hear high-frequency sounds as they age. To accommodate varying receptor sensitivities, frequency sound levels are commonly adjusted, or ‘filtered’, before being logarithmically added and reported as a single ‘sound level’ magnitude of that filtering scale. The ‘A-weighted’ decibel filtering scale applies numerical adjustments to sound frequencies to emphasize the frequencies at which human hearing is sensitive and to minimize the frequencies to which human hearing is not as sensitive, as shown in Table 1.

Table 1: Comparison of Unweighted vs. A-Weighted Sound Levels for a Truck

Octave-Band Center Frequency (Hz)	**A**	**B**	**C=A+B**
	Unweighted Sound Level from a Truck (dB)	**Adjustment of Unweighted Sound to Reflect What Human Ear Hears (dB)**	**Sound Level that Human Ear Perceives = A-Weighted Sound Level or dB(A)**
31	75	-39	36
63	78	-26	52
125	83	-16	67
250	84	-9	75
500	81	-3	78
1000	75	0	75
2000	71	1	72
4000	63	1	64
8000	54	-1	53
	89		**82**
	Total Unweighted Sound Level in dB		**Total A-Weighted Sound Level in dB(A)**

*from the 2016 NCDOT *Traffic Noise Manual*

The A-weighted scale is commonly used in highway traffic noise studies because the typical frequency spectrum of traffic noise is higher in magnitude at the frequencies at which human hearing is noise sensitive (1,000 Hz to 6,000 Hz).

Several examples of common noise levels expressed in dB(A) are listed in Table 2. A review of Table 2 indicates that most individuals are exposed to fairly high noise levels from many sources on a regular basis. To perceive sounds of greatly varying pressure levels, human hearing has a non-linear sensitivity to sound pressure exposure. For example, doubling the sound pressure results in a three (3) decibel change in the noise level; however, variations of three decibels (3 dB(A)) or less are commonly considered “barely perceptible” to normal human hearing. A five decibel (5 dB(A)) change is more readily noticeable. By definition, a ten-fold increase in the sound pressure level correlates to a 10 decibel (10 dB(A)) noise level increase; however, it is judged by most people as only a doubling of the loudness – sounding “twice as loud”.

Table 2: Common Indoor and Outdoor Noise Levels

Common Outdoor Noise Levels	Noise Level (dB(A))	Common Indoor Noise Levels
	110	Rock Band
Jet Flyover at 1,000 feet	100	Inside Subway Train (NY)
Gas Lawn Mower at 3 feet		
Diesel Truck at 50 feet	90	Food Blender at 3 feet
Noisy Urban Daytime	80	Garbage Disposal at 3 feet
Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
	30	
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (Background)
	20	
		Broadcast and Recording Studio
	10	
	0	Threshold of Hearing

Adapted from Guide on Evaluation and Attenuation of Traffic Noise, American Association of State Highway and Transportation Officials (AASHTO). 1974 (revised 1993).

The degree of disturbance or annoyance from exposure to unwanted sound (noise) depends upon three (3) factors:

1. The amount, nature, and duration of the intruding noise;
2. The relationship between the intruding noise and the existing (ambient) sound environment; and
3. The situation in which the disturbing noise is heard.

In considering the first of these factors, it is important to note that individuals have varying sensitivity to noise. Loud noises bother some people more than others. The time patterns and durations of noise(s) also affect perception as to whether it is offensive. For example, noises that occur during nighttime (sleeping) hours are typically considered to be more offensive than the same noises occurring in the daytime.

Regarding the second factor, individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). A car horn blowing at night when background noise levels are low would generally be more objectionable than one blowing in the afternoon when background noise levels are typically higher. The response to noise stimulus is analogous to the response to turning on an interior light. During the daytime, an illuminated bulb simply adds to the ambient light, but when eyes are conditioned to the dark of night, a suddenly illuminated bulb can be temporarily blinding.

The third factor, situational noise, is related to the interference of noise with activities of individuals. In a 60 dB(A) environment, such as is commonly found in a large business office, normal conversation would be possible, while sleep might be difficult. Loud noises may easily interrupt activities that require a quiet setting for greater mental concentration or rest; however, the same loud noises may not interrupt activities requiring less mental focus or tranquility.

Over time, individuals tend to accept the noises that intrude into their lives on a regular basis. However, exposure to prolonged and/or extremely loud noise(s) can prevent use of exterior and interior spaces, and has been theorized to pose health risks. Appropriately, regulations exist for noise control or mitigation from many particularly offensive sources, including airplanes, factories, railroads, and highways. For all “Type I” federal, state, or federal-aid highway projects in the State of North Carolina, traffic and construction noise impact analysis and abatement assessment is dictated by the 2016 NCDOT *Traffic Noise Policy*. The definition of a Type I project can be found in the NCDOT Policy contained in Appendix F of this report. The I-26 Widening project is a Type I project because it proposes the addition of through-traffic lanes.

4.0 NOISE ABATEMENT CRITERIA

4.1 Title 23 Code of Federal Regulations, Part 772 (23 CFR 772)

The Federal Highway Administration (FHWA) has developed Noise Abatement Criteria (NAC) and procedures to be used in the planning and design of highways. The purpose of 23 CFR 772 is, “To provide procedures for noise studies and noise abatement measures to help protect the public’s health, welfare and livability, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to title 23 U.S.C.”

The abatement criteria and procedures are set forth in 23 CFR 772, which also states, “In abating traffic noise impacts, a highway agency shall give primary consideration to exterior areas where frequent human use occurs.” A summary of the NAC for various land uses is presented in Table 3. The L_{eq}, or equivalent sound level, is the equivalent steady-state sound level that, in a stated period of time, contains the same acoustic energy as a time-varying sound level during the same period. With regard to traffic noise, fluctuating sound levels of traffic noise are represented in terms of L_{eq}, the steady, or 'equivalent', noise level with the same energy.

Table 3: Noise Abatement Criteria

Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))

Activity Category	**Activity Criteria[1] $L_{eq(h)}$[2]**	**Evaluation Location**	**Activity Description**
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.
B [3]	67	Exterior	Residential
C [3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare 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, Section4(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
E [3]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
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. The $L_{eq(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
2. The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq(h)}$ being the hourly value of L_{eq}.
3. Includes undeveloped lands permitted for this activity category.

4.2 North Carolina Department of Transportation Traffic Noise Policy

The NCDOT *Traffic Noise Policy,* effective October 6, 2016, establishes official policy on highway noise. This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures and the equitable and cost-effective expenditure of public funds for traffic noise abatement. Where the FHWA has given highway agencies flexibility in implementing 23 CFR 772 standards, this policy describes the NCDOT approach to implementation. This policy is included as Appendix F of this report.

4.3 Definition of Traffic Noise Impacts

Traffic noise impacts are created by either of the following two (2) conditions:

(a) The predicted worst noise hour $L_{eq(h)}$ traffic noise levels for the Design Year approach (reach one decibel less than) or exceed the NAC in Table 3, OR

(b) The predicted worst noise hour $L_{eq(h)}$ traffic noise levels for the Design Year substantially exceed existing noise by 10 dB(A) or more.

5.0 AMBIENT NOISE LEVELS

Ambient noise is noise that is all around us caused by natural and manmade events. It includes the wind, rain, thunder, birds chirping, insects, household appliances, commercial operations, lawn mowers, airplanes, automobiles, etc. It is all noise that is present in a particular area.

Existing traffic noise exposure varies throughout the I-26 Widening project study area. I-26 is the dominant noise source for receptors in proximity to the existing roadway facility. In addition to gathering information and making general observations about the project study area, ambient noise monitoring and field work is conducted to collect noise level and classified vehicle count data that can be used to develop a comparison between hourly-equivalent noise levels measured in the field, at locations where traffic noise is the dominant noise source, and the predicted traffic noise levels obtained from TNM. This exercise is performed to validate the model to local conditions so that it can be used with confidence to predict the future loudest-hour equivalent noise levels and assess potential traffic noise impacts. Ambient noise monitoring is also used to define ambient noise levels at locations where traffic noise is not the primary noise source.

Ambient noise monitoring data were collected at three (3) different locations for 27 sites along the project corridor for a total of 81 noise measurement locations over a period of 20 minutes. Short-term equivalent noise levels measured between June 2, 2014 and June 5, 2014 at specific locations throughout the project study area ranged from 52 dB(A) to 76 dB(A). The ambient noise monitoring locations are shown on Figures 1 through 104. The noise monitoring results, concurrent traffic counts, estimated vehicle speeds, and weather information for the monitoring sites are included in Appendix A.

For this TNR, loudest-hour existing traffic noise levels were assessed as the TNM-predicted traffic noise levels based on existing loudest-hour traffic estimates. Per 23 CFR 772.5, existing noise levels are defined as “the worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area.” If the TNM-predicted existing loudest-hour traffic noise levels are lower than the hourly-equivalent noise levels obtained in the field, then existing noise levels are assessed as the latter.

To validate the accuracy of the model, TNM 2.5 was used to compare hourly-equivalent noise levels measured in the field to TNM-predicted traffic noise levels at the field measurement locations. For each monitoring location, traffic volumes counted during the ambient noise monitoring (20-minute) periods were normalized to 1-hour volumes. These normalized volumes were assigned to the corresponding project area roadways to simulate the noise source strength at the roadways during the actual measurement period. TNM-predicted traffic noise levels were then compared to the hourly-equivalent noise levels measured in the field to determine the accuracy of the model. The NCDOT-accepted tolerance for TNM model validation is ±3.0 dB(A). For 79 of the 81 measurement locations, the TNM-predicted traffic noise levels fell within the ±3.0 dB(A) tolerance when compared to the hourly-equivalent noise levels measured in the field. Two (2) measurement locations (3.1 and 25.1 – see Table C-1 in Appendix C) were not validated because fluctuations in terrain near I-26 were observed to be more substantial in the field than in the digital terrain model. However, the other two (2) locations at each of these sites did validate within 3.0 dB(A). The results of TNM model validation are included in Appendix C.

6.0 PROCEDURE FOR PREDICTING FUTURE NOISE LEVELS

Traffic noise emission is composed of several variables, including the number, types, and travel speeds of the vehicles, as well as the geometry of the roadway(s) on which the vehicles travel. Additionally, variables such as weather and intervening topography affect the transmission of traffic noise from the vehicle(s) to noise sensitive receptors.

In accordance with industry standards and accepted best-practices, detailed computer models were created using the FHWA TNM 2.5. The computer models were validated to within acceptable tolerances of field-monitored traffic noise data and were used to predict loudest-hour equivalent traffic noise levels for receptor locations in the vicinity of the I-4400/I-4700 project. Traffic noise consists of three primary parts: tire/pavement noise, engine noise, and exhaust noise. Of these sources, tire/pavement noise is typically the most offensive at unimpeded travel speeds. Sporadic traffic noises such as horns, squealing brakes, screeching tires, etc. are considered aberrant and are not included within the predictive model algorithm. Traffic noise is not constant; it varies in time depending upon the number, speed, type, and frequency of vehicles that pass by a given receptor. Furthermore, since traffic noise emissions are different for various types of vehicles, the TNM algorithm distinguishes between the source emissions from the following vehicle types: automobiles, medium trucks, heavy trucks, buses, and motorcycles, as shown in Table 4. The computer traffic noise prediction model uses the number and type of vehicles on the planned roadway, vehicle speeds, the physical characteristics of the road (curves, hills, depressions, elevations, etc.), receptor location and height, and, if applicable, barrier type, barrier ground elevation, and barrier segment top elevations. This analysis determines the traffic volumes that yield the loudest hourly noise levels as the lesser of forecasted peak hour traffic volumes and the maximum vehicle capacity that can maintain Level of Service "C" (LOS C) for mainline interstate roadway segments. Refer to Appendix E for the project traffic forecasts used in this study.

Interior hourly-equivalent noise levels are determined for NAC Category D land uses, such as hospitals, medical facilities and places of worship, by applying building noise reduction factors based on building type and window condition that can be found in the 2016 NCDOT *Traffic Noise Manual*. However, because Table 2 indicates that the common indoor background noise level for large rooms is approximately 40 dB(A), this analysis assumes that interior hourly-equivalent noise levels do not drop below this value.

Table 4: Traffic Noise Model (TNM) Vehicle Classification Types

TNM Vehicle Type	Description
Autos	All vehicles with two axles and four tires, including passenger cars and light trucks, weighing 9,900 pounds or less
Medium Trucks	All vehicles having two axles and six tires, weighing between 9,900 and 26,400 pounds
Heavy Trucks	All vehicles having three or more axles, weighing more than 26,400 pounds
Buses	All vehicles designed to carry more than nine passengers
Motorcycles	All vehicles with two or three tires and an open-air driver / passenger compartment

Sources: FHWA Measurement of Highway-Related Noise, § 5.1.3 Vehicle Types.
FHWA Traffic Monitoring Guide, § 4.1 Classification Schemes

Functional designs of the I-26 Widening project were used in this TNR. Per FHWA guidance, the predictions documented in this report are based on the Design Year 2040 Build-condition traffic volumes resulting in the loudest predicted hourly-equivalent traffic noise levels for each receptor. Refer to Appendix B for a comprehensive list of traffic noise receptors, as well as predicted hourly-equivalent traffic noise levels for Base Year 2011, Design Year 2040 No-Build, and Design Year 2040 Build conditions for the Hybrid 6/8-Lane Widening Alternative.

For the purpose of this TNR, the project area was divided into 14 NSAs, generally defined by the interchanges located along the I-26 corridor, to group receptors influenced by similar noise sources in a geographically limited area. These NSAs are shown in Figures 1 through 52 and described in Section 8.5. NSAs one (1) through seven (7), located along I-26 westbound, are numbered from south to north starting at the beginning of the project at the US 25 interchange south of Hendersonville (Exit 54) and ending near Pond Road. NSAs eight (8) through 14, located along I-26 eastbound, are numbered from north to south, starting near Pond Road and ending at the beginning of the project at the US 25 interchange south of Hendersonville (Exit 54).

7.0 TRAFFIC NOISE IMPACTS AND NOISE CONTOURS

Traffic noise impacts occur when the predicted hourly-equivalent traffic noise levels either: [a] approach or exceed the FHWA NAC (with "approach" defined in the NCDOT Noise Policy as reaching one decibel less than the NAC values listed in Table 3), or [b] substantially exceed the existing noise levels (refer to Section 4.3). FHWA and NCDOT require that feasible and reasonable measures be considered to abate traffic noise at all predicted traffic noise impacts. Measures to be considered include alteration of horizontal and vertical alignments, traffic management measures, establishment of buffer zones, construction of noise walls, and noise insulation (of Activity Category D interior land uses).

As shown in Table 5, traffic noise is predicted to result in 399 impacts in the Design Year 2040 Hybrid 6/8-Lane Widening Alternative.

Table 5: Traffic Noise Impact Summary for Build Condition

Detailed Study Alternative	Reason for Noise Impact	Summary of Impacted Receptors[7]							
		By Activity Category							
		A	B	C	D	E	F[5]	G[6]	All Activity Categories
Hybrid 6/8-Lane Widening	Based on NAC Criteria Only[1]	0	393	6	0	0			399
	Based on Substantial Increase Criteria Only[2]	0	0	0	0	0			0
	Based on Both Criteria[3]	0	0	0	0	0			0
	TOTAL DSA IMPACTS[4]	0	393	6	0	0			399

1. Predicted traffic noise level impacts due to design year worst hour build-condition noise levels approaching or exceeding the NCDOT Noise Abatement Criteria (NAC)
2. Predicted design year worst hour noise levels exceeding existing worst hour noise levels by 10 dB(A) or greater. (NCDOT Substantial Increase Criteria).
3. Predicted traffic noise level impacts due to both 1 and 2 above.
4. Only one of the Note 1 and Note 2 conditions must be met for an impact to exist.
5. There are no impact criteria for land use facilities in this activity category and no analysis of noise impacts is required.
6. There are no impact criteria for undeveloped lands but some noise levels may need to be provided to local officials to aid them in future land use planning efforts.
7. Values noted for Activity Category C, D, and E represent Equivalent Receptor values for these non-residential land uses.

Per 23 CFR 772.9(c) and NCDOT Policy, noise contour lines shall not be used for determining highway traffic noise impacts. However, the 71 dB(A) and 66 dB(A) noise level contour information should assist local authorities in exercising land use control over the remaining undeveloped lands (NAC "G"), to avoid development of incompatible activities adjacent to the I-26 Widening project.

Table 6: Predicted Design Year 2040 Build-Condition Traffic Noise Contours

NSA	Location	Predicted Contour Distances from I-26 Centerline (feet)	
		66 dB(A)	71 dB(A)
1	East of I-26: Begin Project (US 25 interchange) to Upward Road interchange	550	375
2	East of I-26: Upward Road interchange to US 64 interchange	800+	375
3	East of I-26: US 64 interchange to North of Clear Creek Road	800+	275
4	East of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange	450	300
5	East of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange	800+	625
6	East of I-26: NC 280 interchange to NC 146 interchange	575	450
7	East of I-26: NC 146 interchange to End Project (near Pond Road)	600	400
8	West of I-26: NC 146 interchange to End Project (near Pond Road)	600	325
9	West of I-26: NC 280 interchange to NC 146 interchange	800+	150
10	West of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange	450	250
11	West of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange	800+	175
12	West of I-26: US 64 interchange to North of Clear Creek Road	600	125
13	West of I-26: Upward Road interchange to US 64 interchange	650	225
14	West of I-26: Begin Project (US 25 interchange) to Upward Road interchange	550	300

Correlating to the traffic noise impact threshold for FHWA NAC "E" land uses, the 71 dB(A) noise level contour is predicted to occur between 125 and 625 feet from the centerline of I-26. The 66 dB(A) noise level contour, which correlates to the traffic noise impact threshold for FHWA NAC "B" and "C", is predicted to occur between 450 and 800+ feet from the centerline of I-26. See Table 6 for more detailed noise contour estimates for each NSA. These noise contours represent worst case conditions, typically in cut sections with extremely steep slopes, and do not necessarily represent the expected noise levels at individual locations. Due to the mountainous terrain and varying topography in this area, significant fluctuations are possible in the distance from the centerline of I-26 at which the 71 and 66 dB(A) noise level contours occur, even within the same NSA.

Given the variation in cross sections and elevations adjacent to the project, it is recommended that any future development proposed in the vicinity of the project be modeled with accurate survey data to avoid creating incompatible land uses adjacent to the project.

8.0 POTENTIAL TRAFFIC NOISE ABATEMENT MEASURES

FHWA and NCDOT require that feasible and reasonable noise abatement measures be considered and evaluated for the benefit of all predicted build-condition traffic noise impacts. Feasibility and reasonableness are distinct and separate considerations. Feasibility considers whether noise abatement measures *can* be implemented based on various acoustical and engineering factors. Reasonableness considers whether noise abatement measures *should* be implemented based on various social, economic, and environmental factors.

Acceptable noise abatement measures considered include highway alignment selection, traffic system management measures, establishment of buffer zones, building insulation of NAC category D land use facilities, and noise walls. Consideration for noise abatement measures was given to all impacted receptors.

8.1 Highway Alignment Selection

Highway alignment selection for traffic noise abatement measures involves modifying the horizontal and/or vertical geometry of the proposed facility to minimize traffic noise to noise-sensitive receptors. For noise abatement, horizontal alignment selection is primarily a matter of locating the roadway at a sufficient distance from noise-sensitive receptors. Appreciable reductions in traffic noise transmission to sensitive receptors can be made by adjusting the vertical highway alignment and/or section geometry. For example, lowering a roadway below existing grade creates a cut section that could act similarly as an earthen berm, depending on the relative location(s) of noise sensitive receptors.

The project proposes to construct additional lanes along I-26 within the project limits from US 25 south of Hendersonville to I-40/I-240 south of Asheville. No further changes to the horizontal or vertical alignment beyond what is proposed in the functional design would be feasible or reasonable due to the constraints of the existing right of way and adjacent development, and the need to maintain traffic on existing lanes as much as possible during construction.

8.2 Traffic System Management Measures

Traffic management measures such as prohibition of truck traffic, lowering speed limits, limiting traffic volumes, and/or limiting time of operation were considered as possible traffic noise impact abatement measures. The purpose of the I-26 Widening project is to increase the functional capacity of the highway facility. Prohibition of truck traffic, reduction of the speed limit below the existing speed limit, or screening total traffic volumes along the interstate would diminish the functional capacity of the interstate highway facility and are not considered practicable.

8.3 Buffer Zones

Buffer zones are typically not practical and/or cost effective for noise mitigation due to the substantial amount of right-of-way required, and would not be a feasible noise mitigation measure for this project due to the proximity of existing development to the right of way. Furthermore, if the acquisition of a suitable buffer zone had been feasible, the associated costs would exceed the NCDOT Policy reasonable abatement cost threshold per benefited receptor.

8.4 Building Insulation

Certain indoor areas may be impacted by exterior traffic noise (see Table 3). If impacted, an assessment as to whether building insulation meets applicable feasibility and reasonableness criteria must be made. Traffic noise is not predicted to impact any NAC category D land uses in the vicinity of the proposed project; therefore, consideration of noise insulation as a measure of noise abatement was not warranted.

8.5 Noise Barriers

Passive noise abatement measures are effective because they absorb, reflect, and/or diffract (redirect) sound energy as well as extending the source-to-receptor sound propagation path. Sound absorption and reflection are functions of abatement medium (e.g. earthen berms absorb more sound energy than comparably tall concrete sound barriers because earthen berms are substantially more massive). Sound diffraction is a function of the abatement medium and shape. The source-to-receptor path is extended by placement of an obstacle, such as a concrete wall, that blocks the propagation of sound waves except for those waves that travel from the source, over the obstacle, and to the receptor.

Highway noise barriers are primarily constructed as earthen berms or solid-mass walls, between partial, de-facto, or full control of access roadways and noise-sensitive land uses. To be effective, a noise barrier must be long enough and have a sufficient vertical profile to shield the impacted receptors. Noise barriers are typically not economical for isolated or low-density land-use areas because the area of a noise wall or volume and footprint of an earthen berm would not be economical.

Due to proximity of development to I-26, area topography, and the limited right of way along the project corridor, there is insufficient space to construct earthen berms as noise abatement for the project. Therefore, earthen berms are not considered feasible noise abatement measures for the project.

Noise Study Areas (NSAs)

For the purpose of this TNR, the project area was divided into 14 NSAs, generally defined by the interchanges located along the I-26 corridor, to group receptors influenced by similar noise sources. The NSAs are defined as follows:

NSA 1: East of I-26: Begin Project (US 25 interchange) to Upward Road interchange
NSA 2: East of I-26: Upward Road interchange to US 64 interchange
NSA 3: East of I-26: US 64 interchange to North of Clear Creek Road
NSA 4: East of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange
NSA 5: East of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange
NSA 6: East of I-26: NC 280 interchange to NC 146 interchange
NSA 7: East of I-26: NC 146 interchange to End Project (near Pond Road)
NSA 8: West of I-26: NC 146 interchange to End Project (near Pond Road)
NSA 9: West of I-26: NC 280 interchange to NC 146 interchange
NSA 10: West of I-26: US 25 (Asheville Highway) interchange to NC 280 interchange
NSA 11: West of I-26: North of Clear Creek Road to US 25 (Asheville Highway) interchange
NSA 12: West of I-26: US 64 interchange to North of Clear Creek Road
NSA 13: West of I-26: Upward Road interchange to US 64 interchange
NSA 14: West of I-26: Begin Project (US 25 interchange) to Upward Road interchange

The NSAs were then further subdivided into Areas A through AAA to organize the presentation of results from the analysis, as well as the corresponding figures. For each area, the location and detailed land use description is outlined below, along with a discussion of impacted receptors for the future design alternatives and the noise abatement measures considered.

NSA 1 (Area A)

Hybrid 6/8-Lane Widening Alternative (Figures 1-2)

Area A (No Preliminarily Feasible and Reasonable Noise Wall)

Area A is located along I-26 westbound between the beginning of the project near the US 25 interchange (Exit 54) and the Upward Road interchange (Exit 53). The primary noise sensitive land use in this area is residential. There were 14 residences modeled in this area: three (3) on Felmet Road, eight (8) on Bennison Lane and three (3) accessible via Crest Road.

There are six (6) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise walls NW1.1 and NW1.3 were evaluated to provide abatement for the impacted receptors. NW1.1 did not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors. NW1.3 did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW1.1 was intended to provide abatement for residences on Bennison Lane, and NW1.3 was intended to provide abatement for residences accessible via Crest Road. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 2 (Areas B – F)

Hybrid 6/8-Lane Widening Alternative (Figures 2-7)

Area B (No Preliminarily Feasible and Reasonable Noise Wall)

Area B is located just north of the Upward Road interchange (Exit 53) along I-26 westbound. The primary noise sensitive land use in this area is residential. There were two (2) residences modeled in this area on McMurray Road.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

Area C (No Preliminarily Feasible and Reasonable Noise Wall)

Area C is located just south of Tracy Grove Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were eight (8) residences modeled in this area: two (2) accessible via McMurray Road and six (6) near Tracy Grove Road.

There are four (4) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise walls NW2.1 and NW2.2 were evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. The analysis of NW2.1 and NW2.2 also includes two (2) receptors from Area D. A noise wall was not evaluated for one (1) isolated impact accessible via McMurray Road since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors. NW2.1 and NW2.2 were intended to provide abatement for residences along Tracy Grove Road, Justus Acres Lane and Randolph Avenue. Detailed analysis of preliminary noise walls can be found in Appendix D.

This area includes one (1) site protected by Section 4(f) of the DOT Act, the McMurray House, at 823 McMurray Road that is recommended eligible for the National Register of Historic Places (NRHP). It is impacted by traffic noise in the Hybrid 6/8-Lane Widening Alternative, but no feasible and reasonable noise wall is recommended in the vicinity of this property.

Area D (No Preliminarily Feasible and Reasonable Noise Wall)

Area D is located just north of Tracy Grove Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were three (3) residences modeled in this area: one (1) on Tracy Grove Road and two (2) on Mid Allen Road.

There are two (2) impacted receptors on Mid Allen Road in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise walls NW2.1 and NW2.2 were evaluated to provide abatement for one (1) impacted receptor, as well as impacted receptors in Area C but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Noise wall NW2.3 was evaluated to provide abatement for the other impacted receptor but did not benefit any receptors in Area D. It is discussed in further detail in the next section. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area E (Preliminarily Feasible and Reasonable Noise Wall – NW2.3)

Area E is located just south of Dana Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 64 residences modeled in this area, mostly along Springside Drive, Willowbrook Road and Maywood Road.

There are 31 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Noise wall NW2.3 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting 43 receptors. It begins between Tracy Grove Road and Dana Road along I-26 westbound and continues approximately 3,120 feet, transitioning from the edge of shoulder to the top of a cut section, and ends at the Dana Road bridge. It is 3,120 feet long with an average height of 18 feet and a total area of 57,391 square feet. This noise wall could potentially obstruct line-of-sight to one advertising billboard east of I-26. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area F (No Preliminarily Feasible and Reasonable Noise Wall)

Area F is located along I-26 westbound between Dana Road and the US 64 interchange. The primary noise sensitive land use in this area is residential. There were 30 residences modeled in this area, mostly along East Prince Road, Lakeview Estate Drive and Wakefield Drive.

There are 12 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW2.5 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW2.5 was intended to provide abatement for residences along East Prince Road, Lakeview Estate Drive and Wakefield Drive. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 3 (Areas G – I)

Hybrid 6/8-Lane Widening Alternative (Figures 7-9)

Area G (No Preliminarily Feasible and Reasonable Noise Wall)

Area G is located just north of the US 64 interchange along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 11 residences modeled in this area: six (6) on Francis Road and five (5) on High Country Lane.

There is one (1) impacted receptor in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

Area H (No Preliminarily Feasible and Reasonable Noise Wall)

Area H is located just south of Clear Creek Road along I-26 westbound. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area I (No Preliminarily Feasible and Reasonable Noise Wall)

Area I is located just north of Clear Creek Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were seven (7) residences modeled in this area along Clear Creek Road.

There are six (6) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW3.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW3.1 was intended to provide abatement for residences on Clear Creek Road. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 3 (Areas J – O)

Hybrid 6/8-Lane Widening Alternative (Figures 10-15)

Area J (No Preliminarily Feasible and Reasonable Noise Wall)

Area J is located along I-26 westbound between Clear Creek Road and Brookside Camp Road. The primary noise sensitive land use in this area is residential. There were 39 residences modeled in this area, mostly along Hart Lane, Kingswood Drive and Wendy Lane.

There are 27 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. A longer alignment of noise wall NW4.1 was evaluated to provide abatement for the impacted receptors in this area, as well as those in Area K, but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW4.1 was intended to provide abatement for residences along Hart Lane, Keeneland Drive, Kingswood Drive and Wendy Lane in Area J. It is discussed in further detail in the next section. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area K (Preliminarily Feasible and Reasonable Noise Wall – NW4.1)

Area K is located just south of Brookside Camp Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 45 residences modeled in this area, mostly on Carolina Circle.

There are 15 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Noise wall NW4.1 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting 23 receptors. It begins between Wendy Lane and Carolina Circle along I-26 westbound and continues approximately 1,680 feet, transitioning from the top of a cut section to edge of shoulder, and ending at the Brookside Camp Road bridge. It is 1,680 feet long with an average height of 20 feet and a total area of 34,333 square feet. This noise wall could potentially obstruct line-of-sight to one advertising billboard east of I-26. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area L (No Preliminarily Feasible and Reasonable Noise Wall)

Area L is located just north of Brookside Camp Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 50 residences modeled in this area, mostly along Dundeve Circle, Whispering Hills Drive and Acorn Drive.

There are 26 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW4.2 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW4.2 was intended to provide abatement for residences along Kimberly Ann Drive, Dundeve Circle, Sheneman Drive, Whispering Hills Drive, and Acorn Drive. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area M (No Preliminarily Feasible and Reasonable Noise Wall)

Area M is located along I-26 westbound between Brookside Camp Road and Naples Road. The primary noise sensitive land use in this area is the Park Ridge Health medical facility, which has an outdoor walking trail. There was one (1) equivalent residence modeled in this area to represent the walking trail. Equivalent residence calculations can be found in Appendix B. There were also nine (9) residences modeled in this area: one (1) on PJs Place and eight (8) on Tulip Trail in the Fletcher Park Inn retirement complex.

There are two (2) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW4.3 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW4.3 was intended to provide abatement for the Park Ridge Health walking trail and the residence on PJs Place. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area N (No Preliminarily Feasible and Reasonable Noise Wall)

Area N is located along I-26 westbound on both sides of Naples Road. The primary noise sensitive land use in this area is residential. There were 15 residences modeled in this area: eight (8) on Sunset Vista Road, three (3) on Holly Oak Drive and four (4) on Twin Springs Road.

There are 11 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise walls NW4.4 and NW4.5 were evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW4.4 and NW4.5 were intended to provide abatement for residences along Sunset Vista Road, Holly Oak Drive and Twin Springs Road. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area O (Preliminarily Feasible and Reasonable Noise Wall – NW4.6)

Area O is located just south of the US 25 (Asheville Highway) interchange (Exit 44) along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 52 residences modeled in this area, mostly along Community Road, Old Hendersonville Road, November Lane and Hickory Flats Drive.

There are 15 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Noise wall NW4.6 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting 30 receptors. It is located along the I-26 westbound off-ramp to US 25 (Asheville Highway) (Exit 44) beginning near the westbound bridge over the Blue Ridge Southern Railroad (BLU) tracks and continuing along the edge of shoulder approximately 1,556 feet to the northwest. The portion of this wall along the bridge over BLU tracks is on structure, and the allowable noise wall height on structure will be addressed in coordination with NCDOT as part of the final design noise report. This noise wall is 1,556 feet long with an average height of 15 feet and a total area of 23,470 square feet. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 5 (Areas P – S)

Hybrid 6/8-Lane Widening Alternative (Figures 15-19)

Area P (Preliminarily Feasible and Reasonable Noise Wall – NW5.3)

Area P is located just north of the US 25 (Asheville Highway) interchange (Exit 44) along I-26 westbound and extends north of Butler Bridge Road. The primary noise sensitive land use in this area is residential. There were 57 residences modeled in this area. Half of these are located mostly on Halliburton Road, Kennerly Drive and Dawley Drive. The other half are mostly along Hope Opal Lane, South Thomas Street and Jim Mills Drive.

Among the first group of receptors, there are eight (8) impacted in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW5.1 was evaluated to provide abatement for the impacted receptors in this group but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW5.1 was intended to provide abatement for residences on Halliburton Road, Kennerly Drive and Dawley Drive.

Among the second group of receptors, there are 14 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. A longer alignment was considered for noise wall NW5.3 to benefit impacted receptors on South Thomas Street and Jim Mills Drive but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Noise wall NW5.3 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting four (4) receptors. It is located along I-26 westbound edge of shoulder beginning just north of the Butler Bridge Road and continuing approximately 420 feet to the northwest. It is 420 feet long with an average height of 11 feet and a total area of 4,749 square feet. This noise wall could potentially obstruct line-of-sight to one advertising billboard east of I-26. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area Q (No Preliminarily Feasible and Reasonable Noise Wall)

Area Q is located just south of the rest area between Butler Bridge Road and Fanning Bridge Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There was one (1) residence modeled in this area on The Carriage Road.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

This area includes one (1) site protected by Section 4(f) of the DOT Act, Rugby Grange, at 1015 The Carriage Road that is listed in the NRHP. It is not impacted by traffic noise in the Hybrid 6/8-Lane Widening Alternative, and no feasible and reasonable noise wall is recommended in the vicinity of this property.

Area R (No Preliminarily Feasible and Reasonable Noise Wall)

Area R is located along I-26 westbound on both sides of Fanning Bridge Road. The primary noise sensitive land use in this area is residential. There were 52 residences modeled in this area, mostly on Wildwood Circle, Wildwood Lane and Norman Road. Boiling Springs Baptist Church was also modeled to determine indoor noise levels.

There are 15 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. One of these is an isolated impact on Underwood Road. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors. Preliminary noise wall NW5.4 was evaluated to provide abatement for the other impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW5.4 was intended to provide abatement for residences on Wildwood Circle. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area S (No Preliminarily Feasible and Reasonable Noise Wall)

Area S is located just south of the NC 280 (Airport Road) interchange (Exit 40) along I-26 westbound. The primary noise sensitive land use in this area is commercial. There were two (2) outdoor hotel pools modeled in this area for the Knights Inn and the Econo Lodge.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

NSA 6 (Areas T – V)

Hybrid 6/8-Lane Widening Alternative (Figures 19-23)

Area T (No Preliminarily Feasible and Reasonable Noise Wall)

Area T is located along I-26 westbound between the NC 280 (Airport Road) interchange (Exit 40) and Glenn Bridge Road. The noise sensitive land uses in this area are commercial and residential. There was one (1) outdoor hotel pool modeled in this area for the Clarion Inn. There were also 109 residences modeled in this area: one (1) on Rockwood Road and 108 on Flycatcher Way in the Audubon Place apartment complex.

There are 40 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW6.1 was evaluated to provide abatement for the impacted receptors, as well as impacted receptors in Area U, but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. A noise wall was not evaluated for Area T on its own since exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor to meet the NCDOT reasonableness criteria. NW6.1 was intended to provide abatement for residences on Flycatcher Way and Rockwood Road in Area T. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area U (No Preliminarily Feasible and Reasonable Noise Wall)

Area U is located just north of Glenn Bridge Road along I-26 westbound. The primary noise sensitive land use in this area is residential. There were 53 residences modeled in this area, mostly along Foxberry Drive, Winding Oak Drive, Wood Glen Court and New Rockwood Road.

There are 26 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW6.1 was evaluated to provide abatement for the impacted receptors, as well as impacted receptors in Area T, but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. NW6.1 was intended to provide abatement for residences on Foxberry Drive, Winding Oak Drive, Wood Glen Court and New Rockwood Road in Area U. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area V (No Preliminarily Feasible and Reasonable Noise Wall)

Area V is located just south of the NC 146 interchange along I-26 westbound. The primary noise sensitive land use in this area is the Park Ridge Health South Asheville medical facility, which was modeled to determine indoor noise levels. There was also one (1) residence modeled in this area accessible via NC 146 (Long Shoals Road).

The receptor accessible via NC 146 (Long Shoals Road) is impacted in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

NSA 7 (Areas W – AA)

Hybrid 6/8-Lane Widening Alternative (Figures 23-27)

Area W (No Preliminarily Feasible and Reasonable Noise Wall)

Area W is located just north of the NC 146 (Long Shoals Road) interchange (Exit 37) along I-26 westbound. The primary noise sensitive land use in this area is commercial. There was one (1) hotel outdoor restaurant seating area modeled in this area for the Hilton Asheville Biltmore Park.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

Area X (No Preliminarily Feasible and Reasonable Noise Wall)

Area X is located along I-26 westbound on both sides of the Blue Ridge Parkway. The primary noise sensitive land use in this area is the Mountains-to-Sea Trail. There was one (1) equivalent residence modeled in this area to represent the walking trail. Equivalent residence calculations for this site can be found in Appendix B.

A portion of the Mountains-to-Sea Trail is impacted in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

Area Y (No Preliminarily Feasible and Reasonable Noise Wall)

Area Y is located along I-26 westbound between the Blue Ridge Parkway and the NC 191 (Brevard Road) interchange (Exit 33). The primary noise sensitive land use in this area is residential. There were four (4) residences modeled in this area on Ferry Road.

There are three (3) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW7.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area Z (No Preliminarily Feasible and Reasonable Noise Wall)

Area Z is located just south of the NC 191 (Brevard Road) interchange (Exit 33) along I-26 westbound. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area AA (No Preliminarily Feasible and Reasonable Noise Wall)

Area AA is located along I-26 westbound between the NC 191 (Brevard Road) interchange (Exit 33) and the end of the project near Pond Road. The primary noise sensitive land use in this area is residential. There were 23 residences modeled in this area: 17 on Pine Lane, two (2) on NC 191 (Brevard Road), two (2) accessible via Old Brevard Road and two (2) on Dogwood Road.

There are 10 impacted receptors near Pine Lane in the Hybrid 6/8-Lane Widening Alternative. A noise wall was analyzed for this location in the I-5504 DNR and is being constructed under the I-5504 project. Therefore, no further noise abatement was considered for these impacted receptors in this TNR.

There are two (2) impacted receptors on Dogwood Road in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW7.2 was evaluated to provide abatement for these impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 8 (Areas BB – FF)

Hybrid 6/8-Lane Widening Alternative (Figures 27-31)

Area BB (No Preliminarily Feasible and Reasonable Noise Wall)

Area BB is located along I-26 eastbound between the end of the project near Pond Road and the NC 191 (Brevard Road) interchange (Exit 33). There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area CC (No Preliminarily Feasible and Reasonable Noise Wall)

Area CC is located along I-26 eastbound on both sides of the NC 191 (Brevard Road) interchange (Exit 33). The primary noise sensitive land use in this area is commercial. There was one (1) hotel outdoor restaurant seating area modeled in this area for the Hampton Inn and two (2) hotel pools modeled for the Holiday Inn Express and the Country Inn & Suites. There were also three (3) residences modeled in this area: one (1) on Rocky Ridge Road and two (2) on Wedgefield Drive.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

Area DD (No Preliminarily Feasible and Reasonable Noise Wall)

Area DD is located along I-26 eastbound between the NC 191 (Brevard Road) interchange (Exit 33) and the Blue Ridge Parkway. The primary noise sensitive land use in this area is residential. There were three (3) residences modeled in this area on Ferry Road.

There are two (2) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW8.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area EE (No Preliminarily Feasible and Reasonable Noise Wall)

Area EE is located along I-26 eastbound on both sides of the Blue Ridge Parkway. The primary noise sensitive land use in this area is the Mountains-to-Sea Trail. There was one (1) equivalent residence modeled in this area to represent the walking trail. Equivalent residence calculations for this site can be found in Appendix B.

A portion of the Mountains-to-Sea Trail is impacted in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

Area FF (No Preliminarily Feasible and Reasonable Noise Wall)

Area FF is located just north of the NC 146 interchange along I-26 eastbound. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

NSA 9 (Areas GG – JJ)

Hybrid 6/8-Lane Widening Alternative (Figures 31-35)

Area GG (No Preliminarily Feasible and Reasonable Noise Wall)

Area GG is located just south of the NC 146 (Long Shoals Road) interchange (Exit 37) along I-26 eastbound. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area HH (No Preliminarily Feasible and Reasonable Noise Wall)

Area HH is located along I-26 eastbound between the NC 146 (Long Shoals Road) interchange (Exit 37) and Glenn Bridge Road. The primary noise sensitive land use in this area is residential. There were three (3) residences modeled in this area on Bear Leah Trail accessible via Glenn Bridge Road.

There are three (3) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW9.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area II (Preliminarily Feasible and Reasonable Noise Wall – NW9.3)

Area II is located along I-26 eastbound on both sides of Glenn Bridge Road. The primary noise sensitive land use in this area is residential. There were 30 residences modeled in this area: one (1) on Bear Leah Trail accessible via Glenn Bridge Road, two (2) on Glenn Bridge Road, 11 on Hidden Creek Drive, five (5) on Wells Drive, nine (9) on Nathan Drive and two (2) on Hidden Creek Road.

There are three (3) impacted receptors near Glenn Bridge Road in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW9.2 was evaluated to provide abatement for these impacted receptors but did not meet reasonableness criteria because exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor.

Among the other receptors, 23 are impacted in the Hybrid 6/8-Lane Widening Alternative. Noise wall NW9.3 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting 21 receptors. It is located between Glenn Bridge Road and NC 280 (Airport Road) along I-26 eastbound edge of shoulder. It is 1,740 feet long with an average height of 18 feet and a total area of 31,376 square feet. This noise wall could potentially obstruct line-of-sight to two (2) advertising billboards west of I-26. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area JJ (No Preliminarily Feasible and Reasonable Noise Wall)

Area JJ is located just north of the NC 280 (Airport Road) interchange (Exit 40) along I-26 eastbound. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

NSA 10 (Areas KK – MM)

Hybrid 6/8-Lane Widening Alternative (Figures 35-39)

Area KK (No Preliminarily Feasible and Reasonable Noise Wall)

Area KK is located along I-26 eastbound between the NC 280 (Airport Road) interchange (Exit 40) and the rest area between Fanning Bridge Road and Butler Bridge Road. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area LL (No Preliminarily Feasible and Reasonable Noise Wall)

Area LL is located along I-26 eastbound between Fanning Bridge Road and Butler Bridge Road. The primary noise sensitive land use in this area is the Broadmoor Golf Links golf course. There was one (1) equivalent residences modeled in this area to represent the holes of the golf course in close proximity to I-26. Equivalent residence calculations for this site can be found in Appendix B.

A portion of the Broadmoor Golf Links golf course is impacted in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

Area MM (No Preliminarily Feasible and Reasonable Noise Wall)

Area MM is located along I-26 eastbound on both sides of Butler Bridge Road. The primary noise sensitive land use in this area is residential. There were 14 residences modeled in this area: two

(2) on Vaughn Circle, two (2) on Butler Bridge Road, three (3) on Dry Hollow Lane, two (2) on North Rugby Road and five (5) on Jade Drive.

There are two (2) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW10.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 11 (Areas NN – SS)

Hybrid 6/8-Lane Widening Alternative (Figures 39-44)

Area NN (No Preliminarily Feasible and Reasonable Noise Wall)

Area NN is located along I-26 eastbound on both sides of the US 25 (Asheville Highway) interchange. The primary noise sensitive land use in this area is residential. There were 33 residences modeled in this area: two (2) on Bicknell Drive, three (3) on C Lane, 19 on Cuerton Place and nine (9) on Alverson Lane.

There are eight (8) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW11.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area OO (No Preliminarily Feasible and Reasonable Noise Wall)

Area OO is located just north of Naples Road along I-26 eastbound. The primary noise sensitive land use in this area is residential. There was one (1) residence modeled in this area on Naples Road.

Relative to I-26, the lone receptor is located directly behind a 25-foot-tall Mountain Inn & Suites building. It is impacted in the Hybrid 6/8-Lane Widening Alternative due to its proximity to Naples Road, which is the primary noise source. Any noise wall along Naples Road would require multiple breaks in continuity due to the numerous driveways and local roads present, compromising the effectiveness of the noise wall. Therefore, noise abatement was not considered for this area.

Area PP (No Preliminarily Feasible and Reasonable Noise Wall)

Area PP is located just south of Naples Road along I-26 eastbound. The primary noise sensitive land use in this area is residential. There were 25 residences modeled in this area, mostly on Old Naples Road, Canterbury Way, Oak Meadow Lane and Sujo Trail.

There are 18 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW11.2 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area QQ (No Preliminarily Feasible and Reasonable Noise Wall)

Area QQ is located along I-26 eastbound between Naples Road and Brookside Camp Road. There are no noise sensitive land uses with outdoor areas of frequent human use in this area.

Area RR (No Preliminarily Feasible and Reasonable Noise Wall)

Area RR is located along I-26 eastbound on both sides of Brookside Camp Road. The primary noise sensitive land use in this area is the Champions Golf Learning Center facility, which includes a driving range, batting cage, miniature golf course and a paintball area. There was one (1) equivalent residence modeled in this area to represent the recreational facility. Equivalent residence calculations for this site can be found in Appendix B.

A portion of the Champions Golf Learning Center facility is impacted in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for this isolated impact since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors.

Area SS (No Preliminarily Feasible and Reasonable Noise Wall)

Area SS is located along I-26 eastbound between Brookside Camp Road and Clear Creek Road. The primary noise sensitive land use in this area is residential. There were two (2) residences modeled in this area on Hyder Farm Road.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

This area includes one (1) site protected by Section 4(f) of the DOT Act, the Hudson Dairy Farm, at 679 Hyder Farm Road, which is recommended eligible for the NRHP. The milking parlor is modeled with this address, and the house is modeled as 672 Hyder Farm Road from the county database. Neither of the locations is impacted by traffic noise in any of the Build Alternatives, and no feasible and reasonable noise wall is recommended in the vicinity of this property.

NSA 12 (Areas TT – VV)

Hybrid 6/8-Lane Widening Alternative (Figures 44-47)

Area TT (No Preliminarily Feasible and Reasonable Noise Wall)

Area TT is located along I-26 eastbound on both sides of Clear Creek Road. The primary noise sensitive land use in this area is residential. There were seven (7) residences modeled in this area: three (3) on Hyder Farm Road, three (3) on Alex Cove Drive and one (1) on Clear Creek Road.

There are three (3) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW12.1 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

This area includes one (1) site protected by Section 4(f) of the DOT Act, the Sholtz-Cantrell Estate, at 37 Hyder Farm Road, which was previously recommended eligible for the NRHP. The house is modeled as 825 Clear Creek Road from the county database. It is not impacted by traffic noise in any of the Build Alternatives, and no feasible and reasonable noise wall is recommended in the vicinity of this property.

Area UU (No Preliminarily Feasible and Reasonable Noise Wall)

Area UU is located along I-26 eastbound between Clear Creek Road and the US 64 (Four Seasons Boulevard/Chimney Rock Road) interchange (Exit 49). The primary noise sensitive land use in this area is residential. There were 27 residences modeled in this area on Carolina Village Road, as well as an outdoor common area for the Carolina Village complex. The complex's medical facility was also modeled to determine indoor noise levels.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

Area VV (No Preliminarily Feasible and Reasonable Noise Wall)

Area VV is located just north of the US 64 interchange along I-26 eastbound. The primary noise sensitive land use in this area is residential. There were 45 residences modeled in this area, mostly along Carolina Village Road and on Lake Club Circle.

There are five (5) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW12.2 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

NSA 13 (Areas WW – ZZ)

Hybrid 6/8-Lane Widening Alternative (Figures 47-51)

Area WW (Preliminarily Feasible and Reasonable Noise Wall – NW13.2)

Area WW is located just south of the US 64 interchange along I-26 eastbound and extends south of Dana Road. The primary noise sensitive land use in this area is residential. There were 56 residences modeled in this area, mostly on West Prince Road, Fairbanks Lane, Dana Road and Meadowlark Lane. Camp Pinewood was also modeled in this area but is not impacted in the Hybrid 6/8-Lane Widening Alternative.

There are 10 impacted receptors north of Dana Road in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW13.1 was evaluated to provide abatement for these impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor.

There are 11 impacted receptors south of Dana Road in the Hybrid 6/8-Lane Widening Alternative. Noise wall NW13.2 preliminarily meets feasibility and reasonableness criteria and would provide abatement for residences in this area, benefiting 23 receptors. It begins just south of the Dana Road bridge along I-26 eastbound at the top of a cut section and transitions to edge of shoulder. It is 2,040 feet long with an average height of 17 feet and a total area of 34,418 square feet. This noise wall could potentially obstruct line-of-sight to three (3) advertising billboards west of I-26. Detailed analysis of preliminary noise walls can be found in Appendix D.

This area includes one (1) site protected by Section 4(f) of the DOT Act, Camp Pinewood (formerly known as Camp Orr), at 300 Orrs Camp Road, which is recommended eligible for the NRHP. Receptors were modeled in TNM at both the tennis courts and the girls' cabins. These two (2) locations were chosen logically as the noise sensitive land uses in closest proximity to I-26. Neither of the locations is impacted by traffic noise in the Hybrid 6/8-Lane Widening Alternative, and no feasible and reasonable noise wall is recommended in the vicinity of this property.

Area XX (No Preliminarily Feasible and Reasonable Noise Wall)

Area XX is located along I-26 eastbound on both sides of Tracy Grove Road. The primary noise sensitive land use in this area is residential. There were 10 residences modeled in this area: four (4) on Orchard Park Road, three (3) on Friendship Lane, one (1) on Town View Court and two (2) on Tracy Grove Road.

There are seven (7) impacted receptors in the Hybrid 6/8-Lane Widening Alternative. A longer alignment of noise wall NW13.2 was evaluated to provide abatement for the impacted receptors in this area, as well as those in Area WW, but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can also be found in Appendix D.

Area YY (No Preliminarily Feasible and Reasonable Noise Wall)

Area YY is located along I-26 eastbound between Tracy Grove Road and the Upward Road interchange. The primary noise sensitive land use in this area is residential. There were 24 residences modeled in this area: 11 on South Allen Road, six (6) on East New Hope Road, five (5) on Carroll Oaks Drive and two (2) on Merry Oaks Lane. The Tracy Grove Community Center was modeled on South Allen Road. The Blue Ridge Community College baseball field was also modeled in this area but is not impacted in the Hybrid 6/8-Lane Widening Alternative.

There are 12 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Preliminary noise wall NW13.3 was evaluated to provide abatement for the impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Area ZZ (No Preliminarily Feasible and Reasonable Noise Wall)

Area ZZ is located just north of the Upward Road interchange along I-26 eastbound. The primary noise sensitive land use in this area is residential. There was one (1) residence modeled in this area on Coleman Drive.

There are no impacted receptors in the Hybrid 6/8-Lane Widening Alternative. Therefore, noise abatement was not considered for this area.

NSA 14 (Area AAA)

Hybrid 6/8-Lane Widening Alternative (Figures 51-52)

Area AAA (No Preliminarily Feasible and Reasonable Noise Wall)

Area AAA is located along I-26 eastbound between the Upward Road interchange (Exit 53) and the beginning of the project near the US 25 interchange (Exit 54). The primary noise sensitive land use in this area is residential. There were 14 residences modeled in this area: two (2) on Crest Road, four (4) on Victoria Springs Drive, six (6) on Hollyhock Court and two (2) on Oak Grove Road.

There are 10 impacted receptors in the Hybrid 6/8-Lane Widening Alternative. A noise wall was not evaluated for one (1) isolated impact on Crest Road since it could not meet feasibility criteria because exterior noise levels could not be reduced by at least five (5) dB(A) for at least two (2) impacted receptors. Preliminary noise wall NW14.1 was evaluated to provide abatement for the other impacted receptors but did not meet reasonableness criteria because the noise wall quantity exceeded the allowable quantity per benefited receptor. Detailed analysis of preliminary noise walls can be found in Appendix D.

Noise Wall Evaluation Summary

Based on the preliminary design, six (6) noise walls are preliminarily meet feasibility and reasonableness criteria, and are therefore recommended for detailed study in a DNR to be completed in accordance with the 2016 NCDOT *Traffic Noise Policy* once the final project design is available.

Due to the preliminary status of the project design, noise wall alignment ground profiles are not sufficient for final design. It is the recommendation of this TNR that a comprehensive noise abatement design review be conducted as part of the project's final design. Table 7 provides a summary of the preliminarily feasible and reasonable noise walls for the Hybrid 6/8-Lane Widening Alternative. Additional preliminary noise walls that were evaluated but did not meet feasibility and reasonableness criteria are summarized in Table 8. Appendix D contains a detailed assessment of all noise walls, including those that did not meet feasibility and reasonableness criteria.

Table 7: Preliminarily Feasible and Reasonable Noise Walls

Noise Wall Name	Benefited Area	Approx. Length (ft)	Approx. Area (sq ft)	Number of Impacted Receptors	Total Number of Benefits		Quantity of Wall per Benefit (sq ft) / Allowable Quantity
					< 7 dB(A)	≥ 7 dB(A)	
HYBRID 6/8-LANE WIDENING ALTERNATIVE							
NW2.3	Residences along Springside Drive, Willowbrook Road and Katie Drive	3,120	57,391	32	7	36	1,335 / 1,500
NW4.1	Residences on Carolina Circle	1,680	34,333	42	10	13	1,493 / 1,500
NW4.6	Residences on Community Road, Old Hendersonville Road, Pleasant Row Drive, Fender Drive, November Lane and Hickory Flats Drive	1,556	23,470	15	11	19	782 / 1,500
NW5.3	Residences on Hope Opal Lane	420	4,749	14	3	1	1,187 / 1,500
NW9.3	Residences on Hidden Creek Drive, Nathan Drive, Wells Drive and Hidden Creek Road	1,740	31,376	23	10	11	1,494 / 1,500
NW13.2	Residences on Meadowlark Lane and Papa Joes Way	2,040	34,418	18	14	9	1,496 / 1,500
	TOTALS	***10,556***	***185,737***	***144***	***55***	***89***	**---**

Table 8: Preliminary Noise Walls Not Meeting Feasibility and Reasonableness Criteria

Noise Wall Name	Benefited Area	Approx. Length (ft)	Approx. Area (sq ft)	Number of Impacted Receptors	Total Number of Benefits		Quantity of Wall per Benefit (sq ft) / Allowable Quantity
					< 7 dB(A)	≥ 7 dB(A)	
HYBRID 6/8-LANE WIDENING ALTERNATIVE							
NW1.1	A residence on Bennison Lane	2,460	51,985	3	0	1	51,985 / 1,500
NW1.3	Residences on Crest Road	2,160	46,335	2	1	1	23,168 / 1,500
NW2.1-2.2	Residences on Justus Acres Lane, Randolph Avenue, Tracy Grove Road and Mid Allen Road	2,579	53,981	4	6	1	7,712 / 1,500
NW2.5	Residences on Lakeview Estate Road, Wakefield Drive, E Prince Road and Bird Haven Road	3,300	55,265	12	10	5	3,684 / 1,500
NW3.1	Residences on Clear Creek Road	1,980	26,022	6	4	2	4,337 / 1,500
NW4.2	Residences on Kimberly Ann Drive, Dundeve Circle, Sheneman Drive, Whispering Hills Drive and Acorn Drive	3,659	68,695	26	12	21	2,082 / 1,500
NW4.3	A residence on PJs Place and the Park Ridge Health walking trail	2,400	47,219	2	1	1	23,610 / 1,500

Table 8: Preliminary Noise Walls Not Meeting Feasibility and Reasonableness Criteria

Noise Wall Name	Benefited Area	Approx. Length (ft)	Approx. Area (sq ft)	Number of Impacted Receptors	Total Number of Benefits		Quantity of Wall per Benefit (sq ft) / Allowable Quantity
					< 7 dB(A)	≥ 7 dB(A)	
NW4.4-4.5	Residences on Sunset Vista Road, Holly Oak Drive and Twin Springs Road	2,940	60,402	11	6	3	6,711 / 1,500
NW5.1	Residences on Halliburton Road and Dawley Drive	1,020	20,904	8	3	1	5,226 / 1,500
NW5.4	Residences on Wildwood Circle	1,560	30,116	14	5	10	2,008 / 1,500
NW6.1	Residences on Foxberry Drive, Winding Oak Drive, Wood Glen Court and New Rockwood Road	2,520	49,221	66	7	11	2,735 / 1,500
NW7.1	Residences on Ferry Road	1,380	16,613	3	3	1	4,153 / 1,500
NW7.2	Residences on Dogwood Road	1,440	27,090	2	1	1	13,545 / 1,500
NW8.1	Residences on Ferry Road	660	6,901	2	1	1	3,451 / 1,500
NW9.1	Residences on Bear Leah Trail	720	6,894	3	1	2	2,298 / 1,500
NW9.2	N/A	1,341	32,875	3	0	0	N/A / 1,500
NW10.1	Residences on Vaughn Circle	1,140	13,828	2	1	1	6,914 / 1,500
NW11.1	Residences on Cuerton Place and Alverson Lane	780	13,690	8	4	1	2,738 / 1,500

Table 8: Preliminary Noise Walls Not Meeting Feasibility and Reasonableness Criteria

Noise Wall Name	Benefited Area	Approx. Length (ft)	Approx. Area (sq ft)	Number of Impacted Receptors	Total Number of Benefits		Quantity of Wall per Benefit (sq ft) / Allowable Quantity
					< 7 dB(A)	≥ 7 dB(A)	
NW11.2	Residences on Naples Glenn Trail, Old Naples Road, Canterbury Way, Canterbury Hill Lane, Oak Meadow Lane, Sujo Trail and High Hills Road	4,979	98,198	18	9	13	4,464 / 1,500
NW12.1	Residences on Hyder Farm Road and Alex Cove Drive	840	8,700	3	2	1	2,900 / 1,500
NW12.2	Residences on Carolina Village Road and Lake Spur Drive	1,140	22,287	5	4	2	3,715 / 1,500
NW13.1	Residences on W Prince Road, Fairbanks Lane and Dana Road	2,160	28,123	10	4	7	2,557 / 1,500
NW13.3	Residences on S Allen Road, E New Hope Road, Carroll Oaks Drive and Merry Oaks Lane	4,080	65,092	12	10	6	4,080 / 1,500
NW14.1	Residences on Hollyhock Court and Oak Grove Road	2,820	66,593	9	2	0	33,297 / 1,500
	TOTALS	***50,058***	***917,029***	***234***	***97***	***93***	***---***

In accordance with the 2016 NCDOT *Traffic Noise Policy*, these noise walls preliminarily meet feasibility and reasonableness requirements, based on available information. Once the final project design is available, a final decision on feasibility and reasonableness will be made upon completion of a Design Noise Report (DNR) and its acceptance by NCDOT and FHWA, as well as the public involvement process. Reasonableness criteria outlined in Section 11.3 of the 2016 NCDOT *Traffic Noise Manual* include the solicitation of property owners' and tenants' preferences for all receptors potentially benefited by noise abatement measures. This is done through a vote with weighted ballots, as described in Section 11.3.1. Changes may occur as more detailed information on mapping and final design becomes available. Any changes in noise abatement measures as detailed in this report must be approved by the FHWA prior to implementation. Final survey mapping and final design, which were not available for this report, may reveal issues related to feasibility or reasonableness not known at this time.

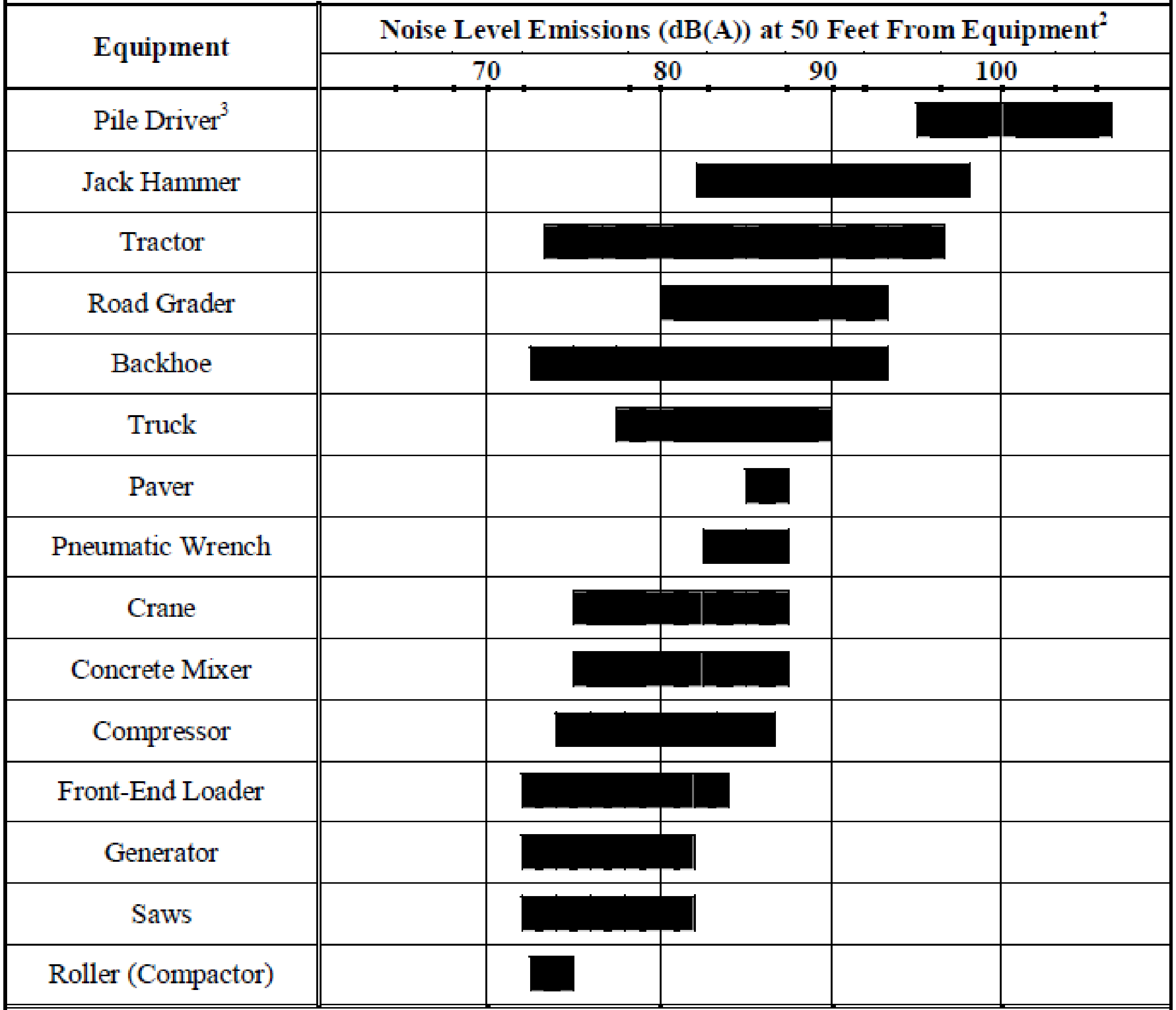
9.0 CONSTRUCTION NOISE

The predominant construction activities associated with this project are expected to be earth removal, hauling, grading, paving and pile driving for bridge construction. Temporary and localized construction noise impacts may occur as a result of these activities. For information on typical noise level emissions of common construction equipment, refer to Table 9 on the following page. During daytime hours, the predicted effects of these impacts could be temporary speech interference for passers-by and those individuals living or working near the project. During evening and nighttime hours, steady-state construction noise emissions such as those from paving operations could be audible, and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions such as from backup alarms, lift gate closures ("slamming" of dump truck gates), etc., will be perceived as distinctly louder than the steady-state acoustic environment, and could impact the general peace and usage of noise-sensitive areas – particularly residences, hospitals, and hotels.

Extremely loud construction noise activities such as usage of pile-drivers and impact-hammers (jack hammer, hoe-ram) will provide sporadic and temporary construction noise impacts in the near vicinity of those activities. Residences and other noise sensitive land uses in close proximity to proposed bridge replacements along the I-26 corridor are most likely to be temporarily impacted by loud construction activities, including the demolition of existing bridges and the construction of a new bridge along with interchange ramps in some cases. Bridge demolition and construction will likely impact the following noise sensitive receptors:

- Residences on Crest Road in NSA 1 and NSA 14
- Residences on Old Hendersonville Road in NSA 4
- Residences on Hope Opal Lane in NSA 5 and Butler Bridge Road in NSA 10
- Residences on Wildwood Circle and Underwood Road, as well as Boiling Springs Baptist Church in NSA 5
- Residences on Foxberry Drive in NSA 6 and Glenn Bridge Road in NSA 9
- The Mountains-to-Sea Trail in NSA 7 and NSA 8
- Hotels near NC 191 (Brevard Road) in NSA 8

Table 9 : Construction Equipment Typical Noise Level Emissions[1]



1. Adapted from *Noise Construction Equipment and Operations, Building Equipment, and Home Appliances*. U.S. Environmental Protection Agency. Washington D.C. 1971.
2. Cited noise level ranges are typical for the respective equipment. For "point sources" such as the construction equipment listed above, noise levels generally dissipate at a rate of -6 dB(A) for every doubling of distance. For example, if the noise level from a pile driver at a distance of 50 feet = 100 decibels (dB(A)), then at 400 feet, it will generally be 82 decibels (dB(A)) or less.
3. Due to project safety and potential construction noise concerns, pile driving activities are typically limited to daytime hours.

Construction activities that will produce extremely loud noises should be scheduled during times of the day when such noises will create as minimal disturbance as possible, typically weekday daytime hours. One exception to this is the Mountains-to-Sea Trail, for which nighttime construction activities are less likely to create a disturbance. For construction activities near Boiling Springs Baptist Church, consideration should be given to avoiding times of regularly occurring services or activities, typically Sunday mornings and Wednesday evenings.

Generally, low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent possible. These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of "tail gate banging", ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

While discrete construction noise level prediction is difficult for a particular receptor or group of receptors, it can be assessed in a general capacity with respect to distance from known or likely project activities. For this project, earth removal, grading, hauling, and paving is anticipated to occur in the vicinity of noise-sensitive receptors. Although construction noise impact mitigation should not place an undue burden on the financial cost of the project or the project construction schedule, pursuant to the requirements of 23 CFR 772.19, it is the recommendation of this TNR that:

- Earth removal, grading, hauling, and paving activities in the vicinity of residences should be limited to weekday daytime hours.

- If meeting the project schedule requires that earth removal, grading, hauling and / or paving must occur during evening, nighttime and / or weekend hours in the vicinity of residences, the Contractor shall notify NCDOT as soon as possible. In such instance(s), all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise impacts upon the affected property owners and / or residents.

- If construction noise activities must occur during context-sensitive hours in the vicinity of noise-sensitive areas, discrete construction noise abatement measures including, but not limited to portable noise barriers and / or other equipment-quieting devices should be considered.

- Some construction activities could create extremes noise impacts for nearby noise-sensitive land uses. For example, pile driving activities can pose an extreme noise impact for distances of up to one-quarter mile. It is the recommendation of this TNR that considerations be made for any nearby residences for all evening and/or nighttime periods (7:00 p.m. – 7:00 a.m.) throughout which extremely loud construction activities might occur.

For additional information on construction noise, please refer to the FHWA Construction Noise Handbook (FHWA-HEP-06-015) and the Roadway Construction Noise Model (RCNM), available online at: http://www.fhwa.dot.gov/environment/noise/cnstr_ns.htm.

10.0 CONCLUSION

Traffic noise impacts and temporary construction noise impacts can be a consequence of transportation projects, especially for noise-sensitive land uses in close proximity to high-volume and/or high-speed existing steady-state traffic noise sources. This TNR utilized computer models created with the FHWA Traffic Noise Model® software (FHWA TNM v.2.5), validated to field-collected traffic noise monitoring data, to determine existing and to predict future loudest-hour equivalent noise levels and identify impacted receptors resulting from the I-4400/I-4700 project in Henderson and Buncombe Counties.

In the vicinity of the I-4400/I-4700 project, Base Year 2011 and No-Build 2040 traffic noise approaches or exceeds FHWA Noise Abatement Criteria (NAC) for 261 and 298 receptors respectively. For Design Year 2040 traffic volumes, the Hybrid 6/8-Lane Widening Alternative is predicted to result in 399 traffic noise impacts.

Construction noise impacts may occur due to the proximity of noise-sensitive residential receptors to project construction activities. It is the recommendation of this TNR that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts.

In accordance with the 2016 NCDOT Policy, consideration for noise abatement measures was given to all impacted receptors for the Hybrid 6/8-Lane Widening Alternative. Traffic noise abatement measures are preliminarily feasible and reasonable in six (6) locations for the benefit of 144 receptors in the vicinity of the project, based on available information.

The six (6) recommended noise walls for the Hybrid 6/8-Lane Widening Alternative preliminarily meet feasibility and reasonableness requirements based on available information. Once the final project design is available, a final decision on feasibility and reasonableness will be made upon completion of a Design Noise Report (DNR) and its acceptance by NCDOT and FHWA, as well as the public involvement process. Reasonableness criteria outlined in Section 11.3 of the 2016 NCDOT *Traffic Noise Manual* include the solicitation of property owners' and tenants' preferences for all receptors potentially benefited by noise abatement measures. This is done through a vote with weighted ballots, as described in Section 11.3.1. Changes may occur as more detailed information on mapping and final design becomes available. Any changes in noise abatement measures as detailed in this report must be approved by the FHWA prior to implementation.

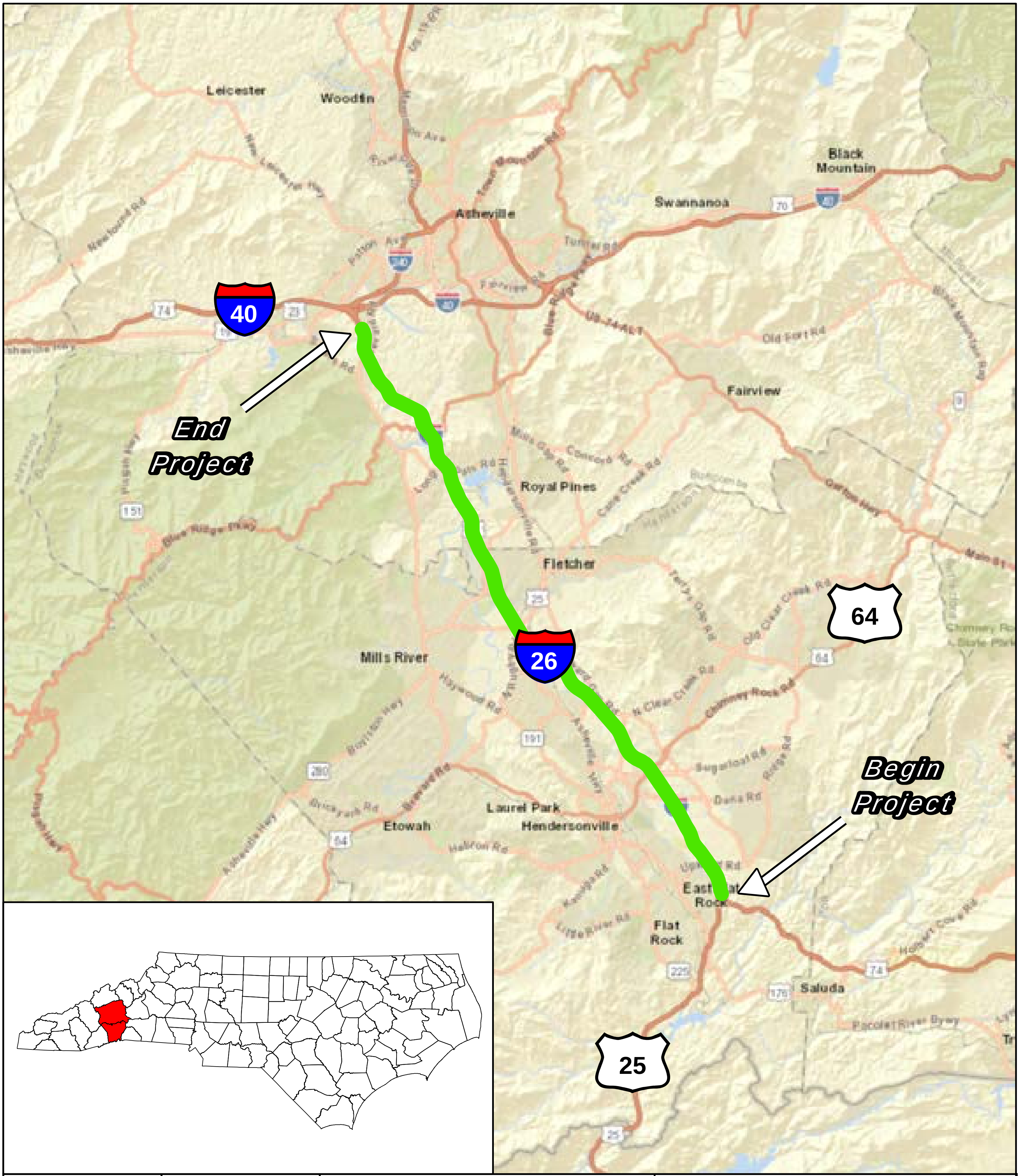
11.0 REFERENCES

Federal Highway Administration. CFR 23 Part 772 – Procedures for Abatement of Highway Traffic Noise and Construction Noise. [75 FR 39820-39838, July 13, 2010].

Federal Highway Administration. *Highway Traffic Noise: Analysis and Abatement Guidance*. 2011.

North Carolina Department of Transportation. *Traffic Noise Policy*. October 6, 2016.

North Carolina Department of Transportation. *Traffic Noise Manual*. October 6, 2016.



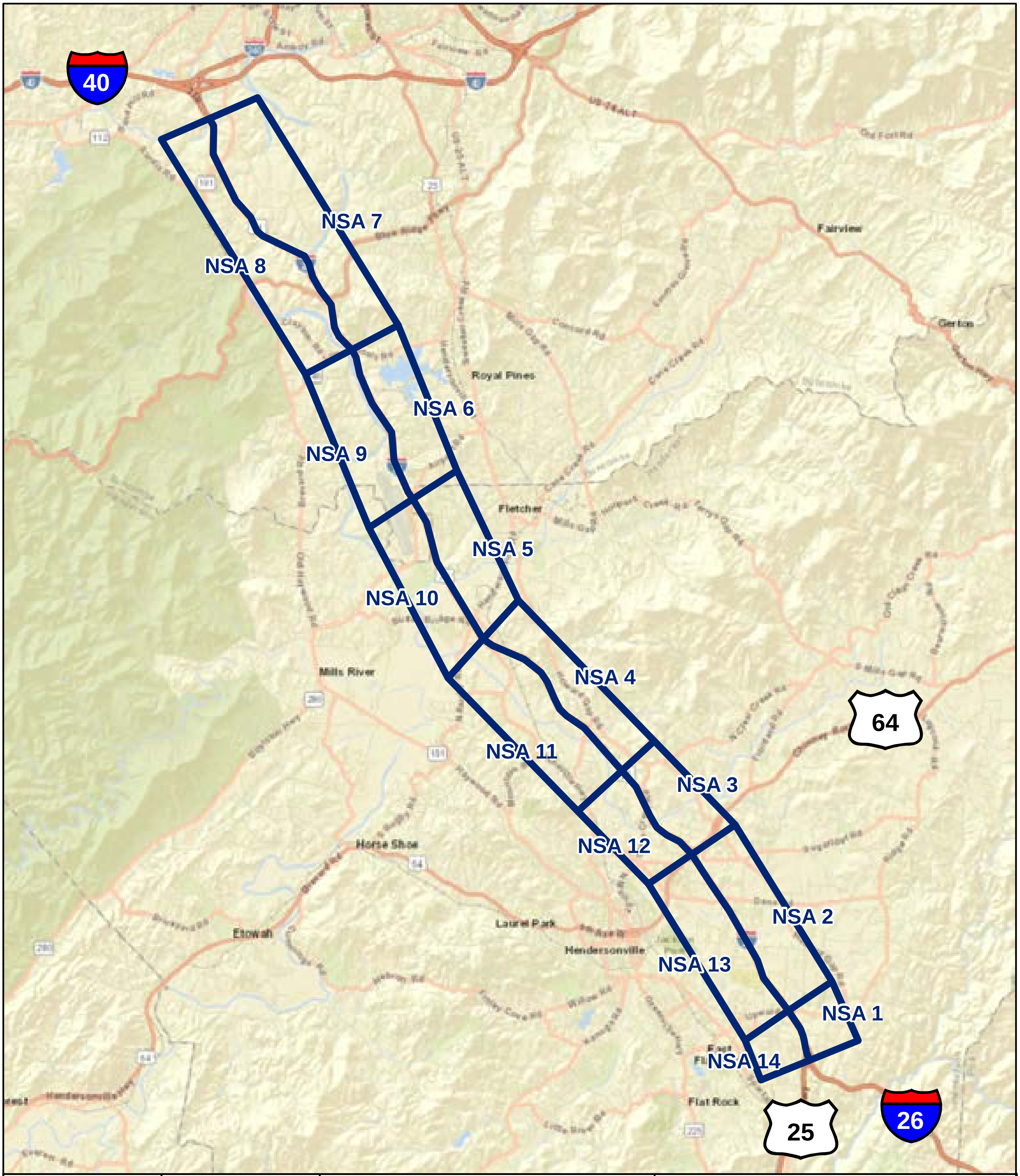
Vicinity Map

0 2.5 5 10 Miles

1 inch = 5 mi

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



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Noise Study Area (NSA) Boundaries

0 1.5 3 6 Miles

1 inch = 3 mi

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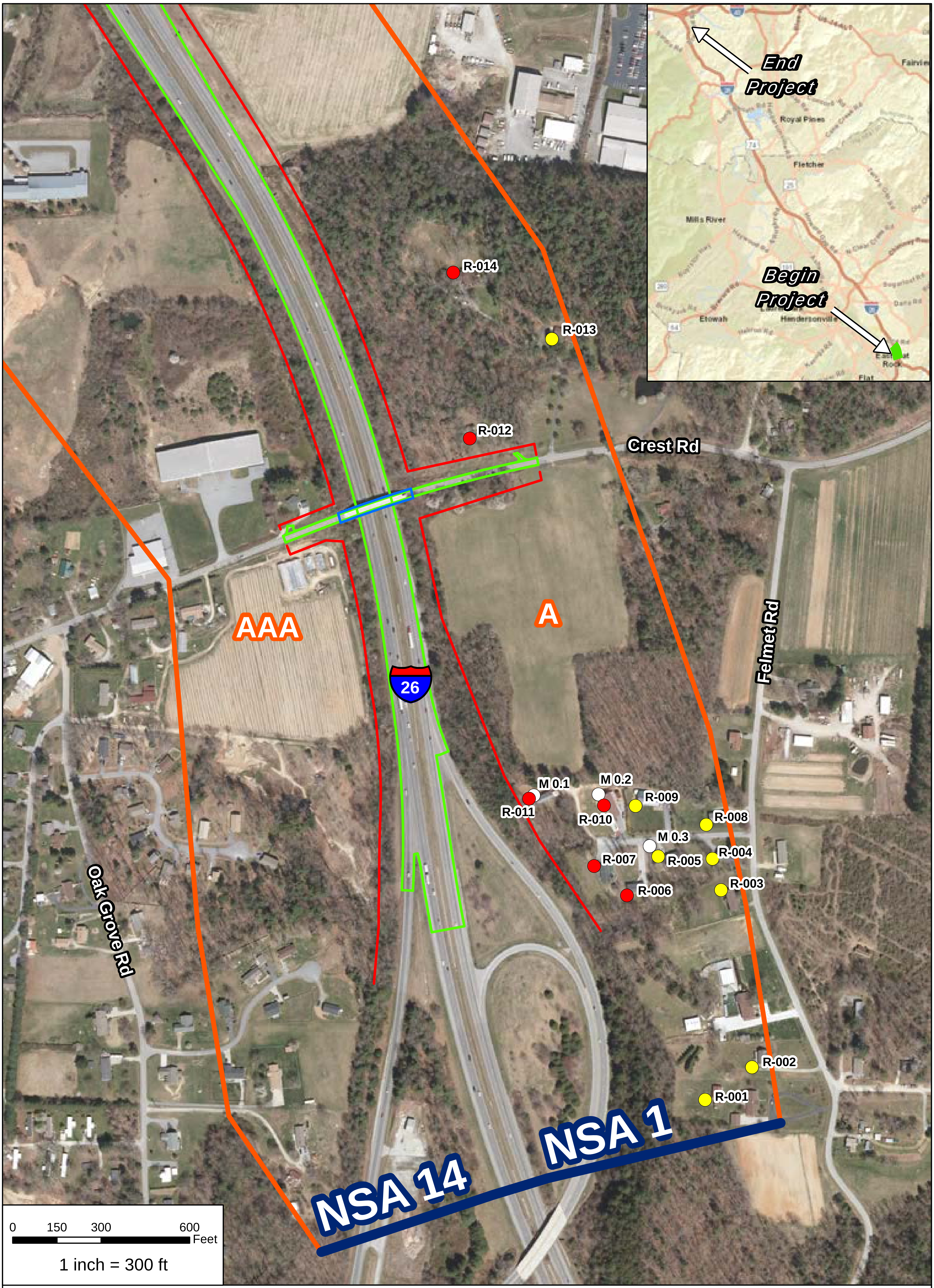
July 2017



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● Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 1

NSA 1 (Area A)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

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-Henderson and Buncombe Counties-
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Legend

● Impacted, Benefited

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● Not Impacted, Not Benefited

○ Monitoring Sites

● NAC Category F

⊗ Acquired as Right-of-Way

▨ Removed Pavement

— NSA Boundary

— Preliminary Feasible and Reasonable Noise Wall

— Edge of Pavement

— Proposed Right-of-Way

— Proposed Bridge

Figure 2

NSA 1 (Area A)
NSA 2 (Area B)
Hybrid 6/8-Lane
Widening Alternative

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- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
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- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 3

NSA 2 (Area C)
Hybrid 6/8-Lane
Widening Alternative

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-Henderson and Buncombe Counties-
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Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 4

NSA 2 (Area D)
Hybrid 6/8-Lane
Widening Alternative

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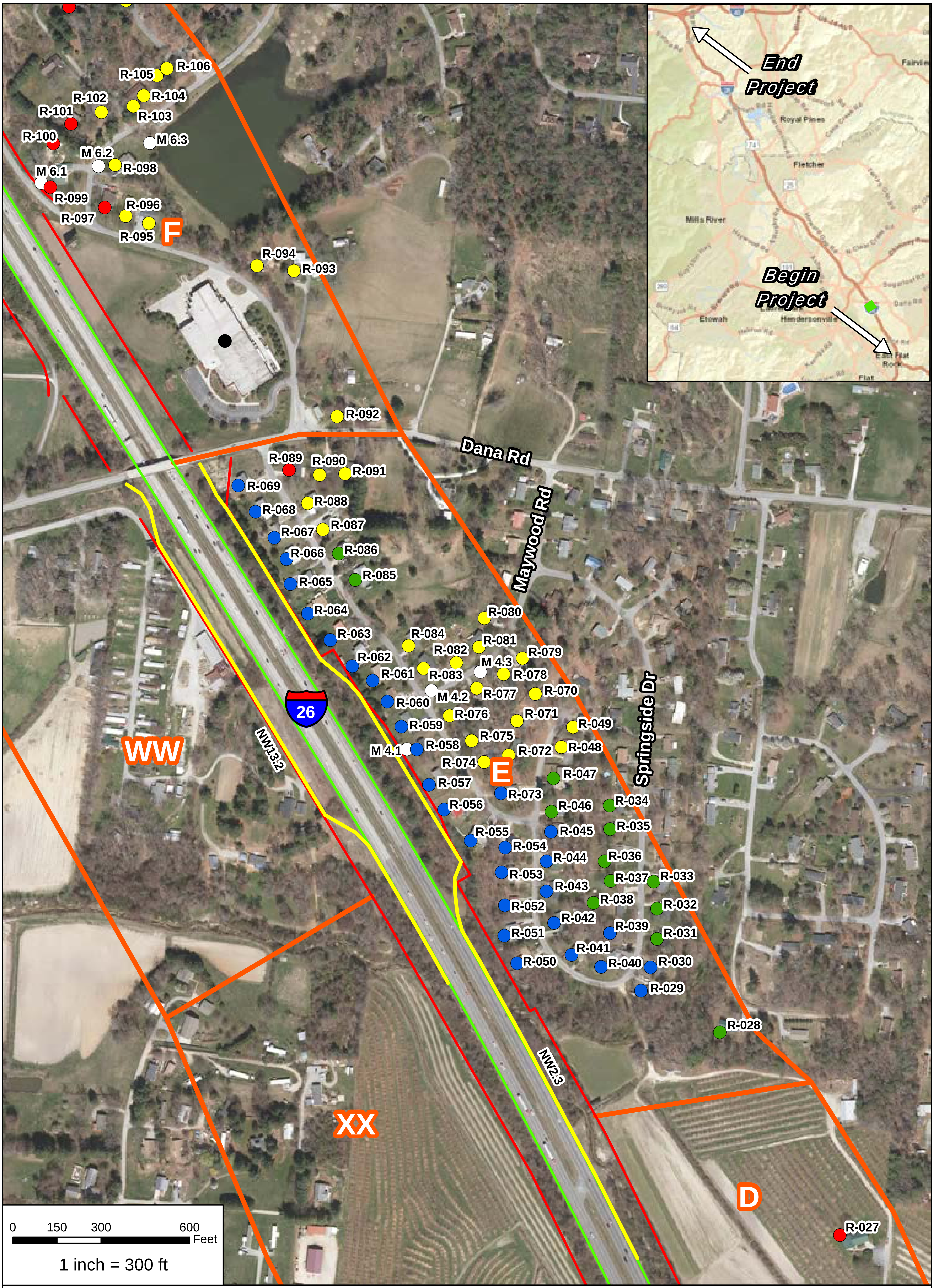

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○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 5

NSA 2 (Area E)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

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-Henderson and Buncombe Counties-
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Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
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- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- NSA Boundary
- Preliminary Feasible and Reasonable Noise Wall
- Edge of Pavement
- Proposed Right-of-Way
- Proposed Bridge

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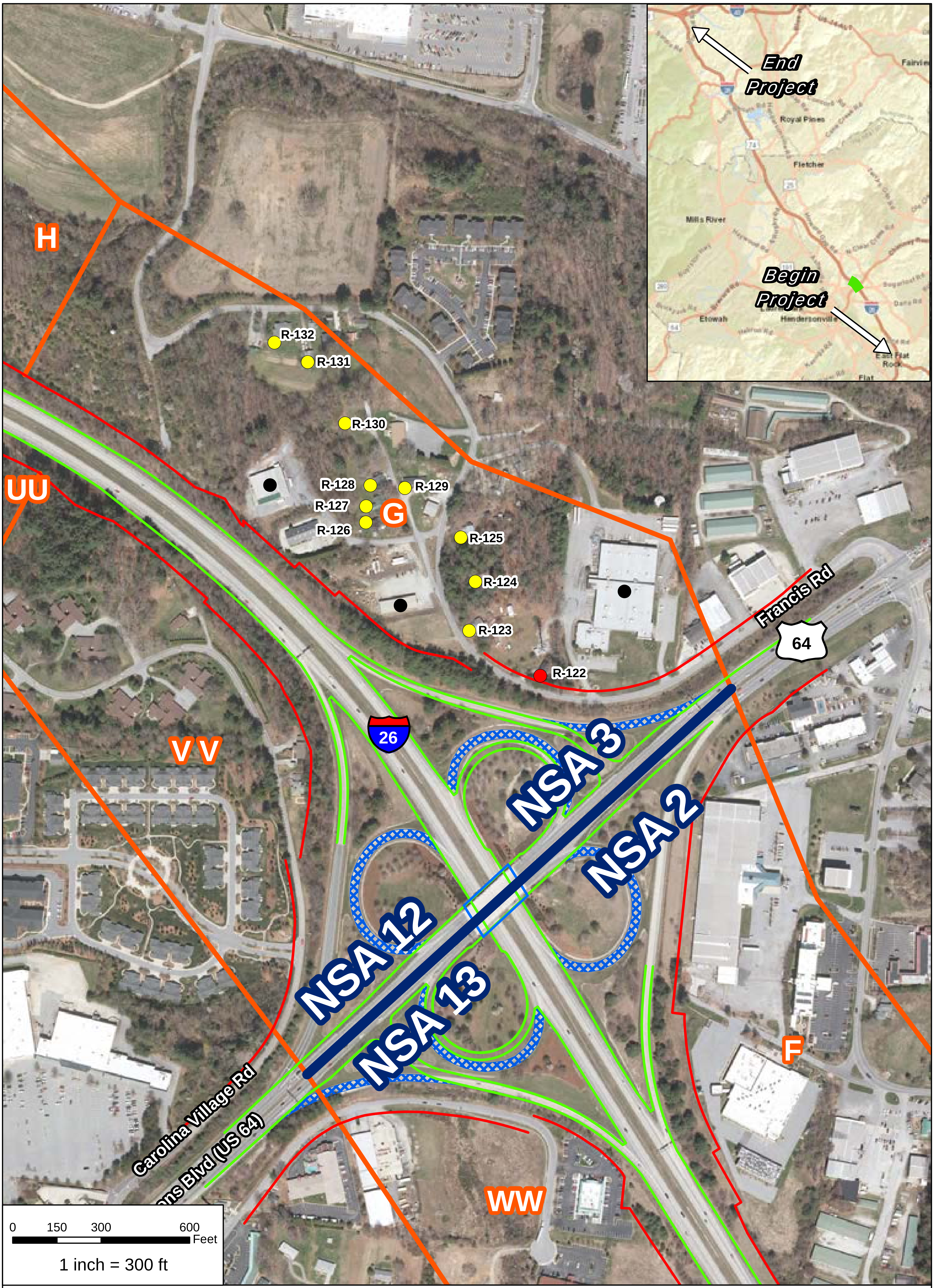
Figure 6

NSA 2 (Area F)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



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○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
━ NSA Boundary
━ Preliminary Feasible and Reasonable Noise Wall
━ Edge of Pavement
━ Proposed Right-of-Way
━ Proposed Bridge

Figure 7

NSA 2 (Area F)
NSA 3 (Area G)
Hybrid 6/8-Lane
Widening Alternative

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Legend

- ● Impacted, Benefited
- ● Impacted, Not Benefited
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- ● Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

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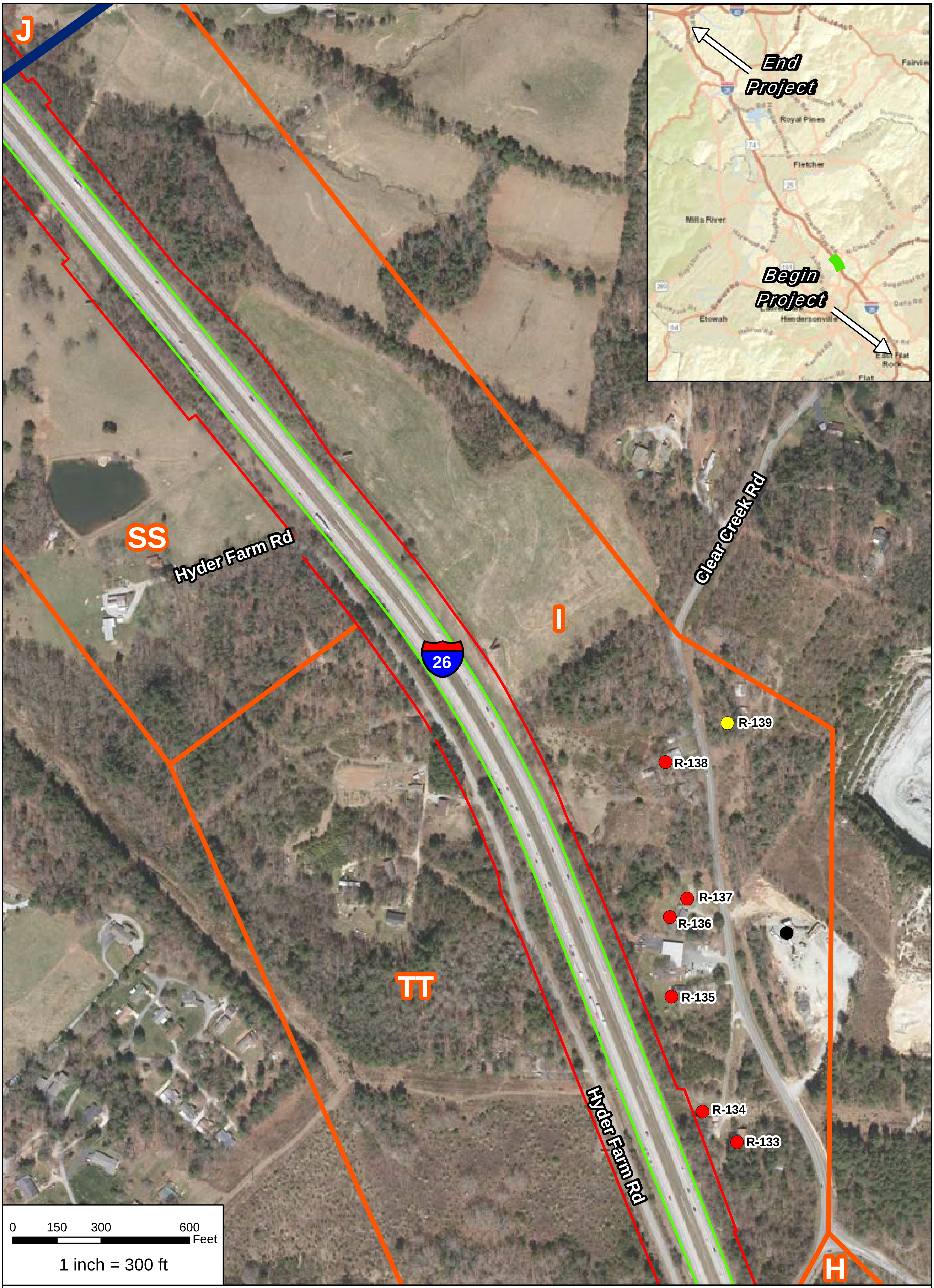
Figure 8

NSA 3 (Area H)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



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● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 9

NSA 3 (Area I)
Hybrid 6/8-Lane
Widening Alternative

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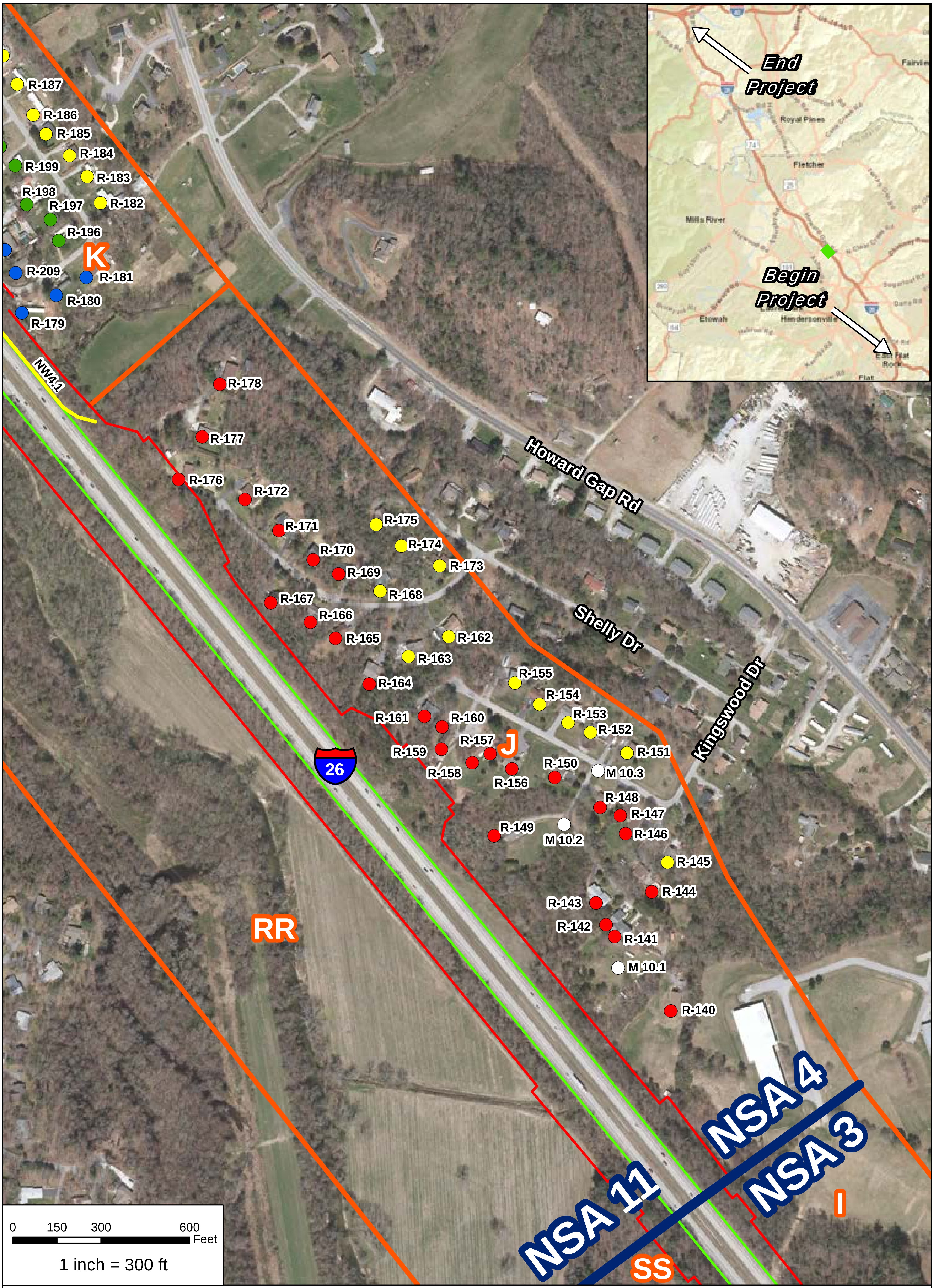

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⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 10

NSA 4 (Area J)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

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-Henderson and Buncombe Counties-
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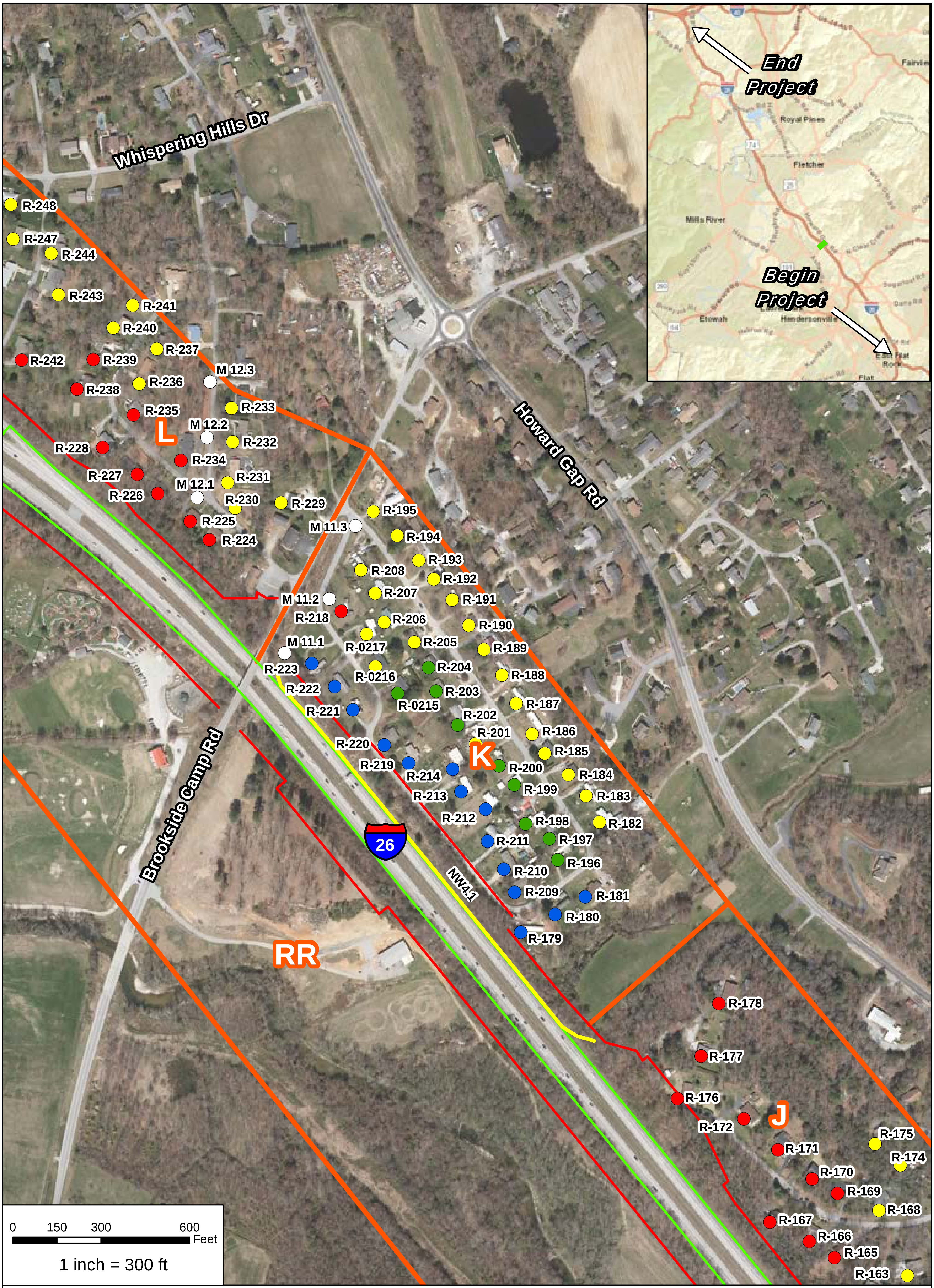
July 2017



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⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 11

NSA 4 (Area K)
Hybrid 6/8-Lane
Widening Alternative

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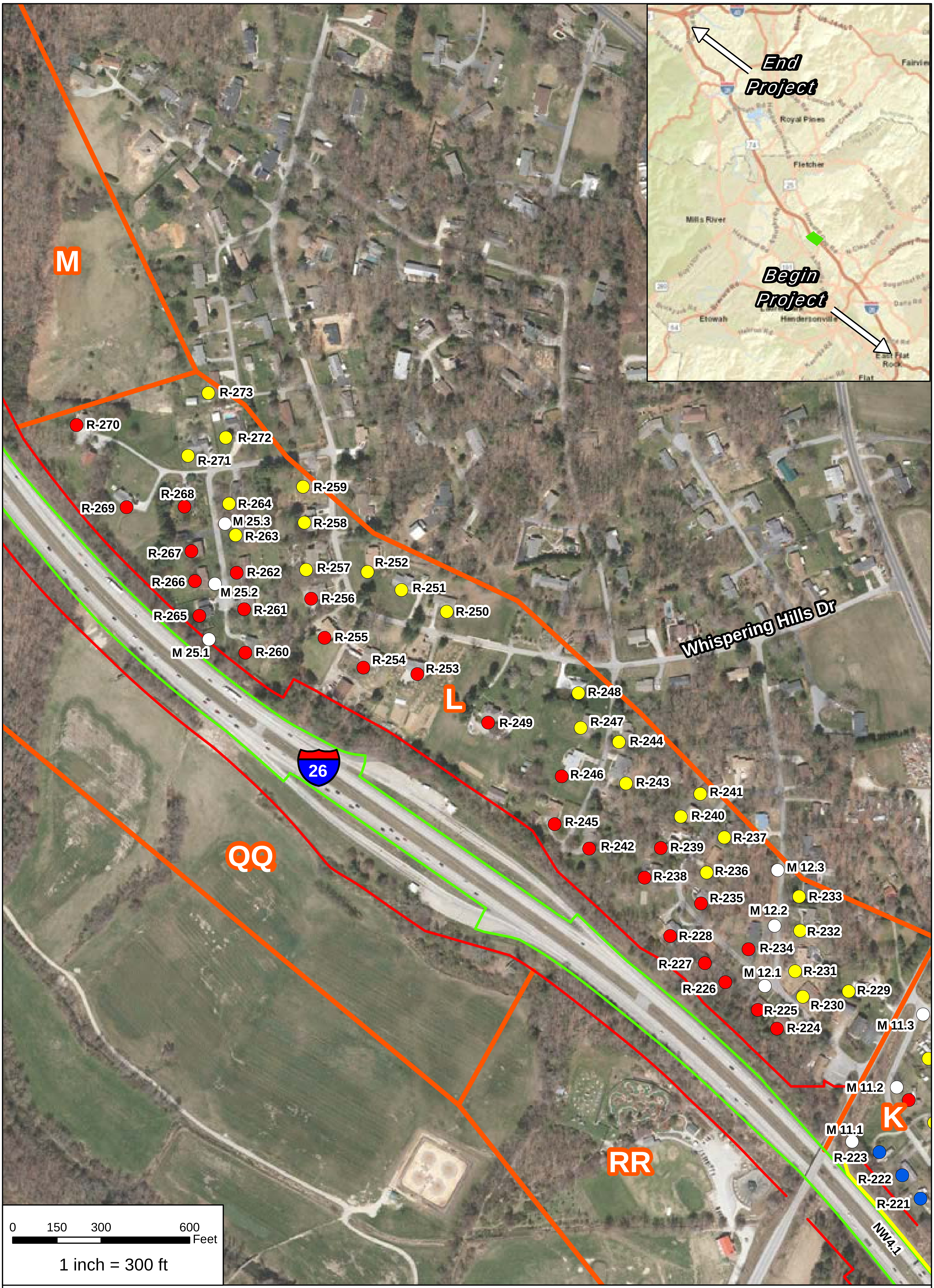

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○ Monitoring Sites
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⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 12

NSA 4 (Area L)
Hybrid 6/8-Lane
Widening Alternative

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○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 13

NSA 4 (Area M)
Hybrid 6/8-Lane
Widening Alternative

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-Henderson and Buncombe Counties-
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Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

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Figure 14

NSA 4 (Area N)
Hybrid 6/8-Lane
Widening Alternative

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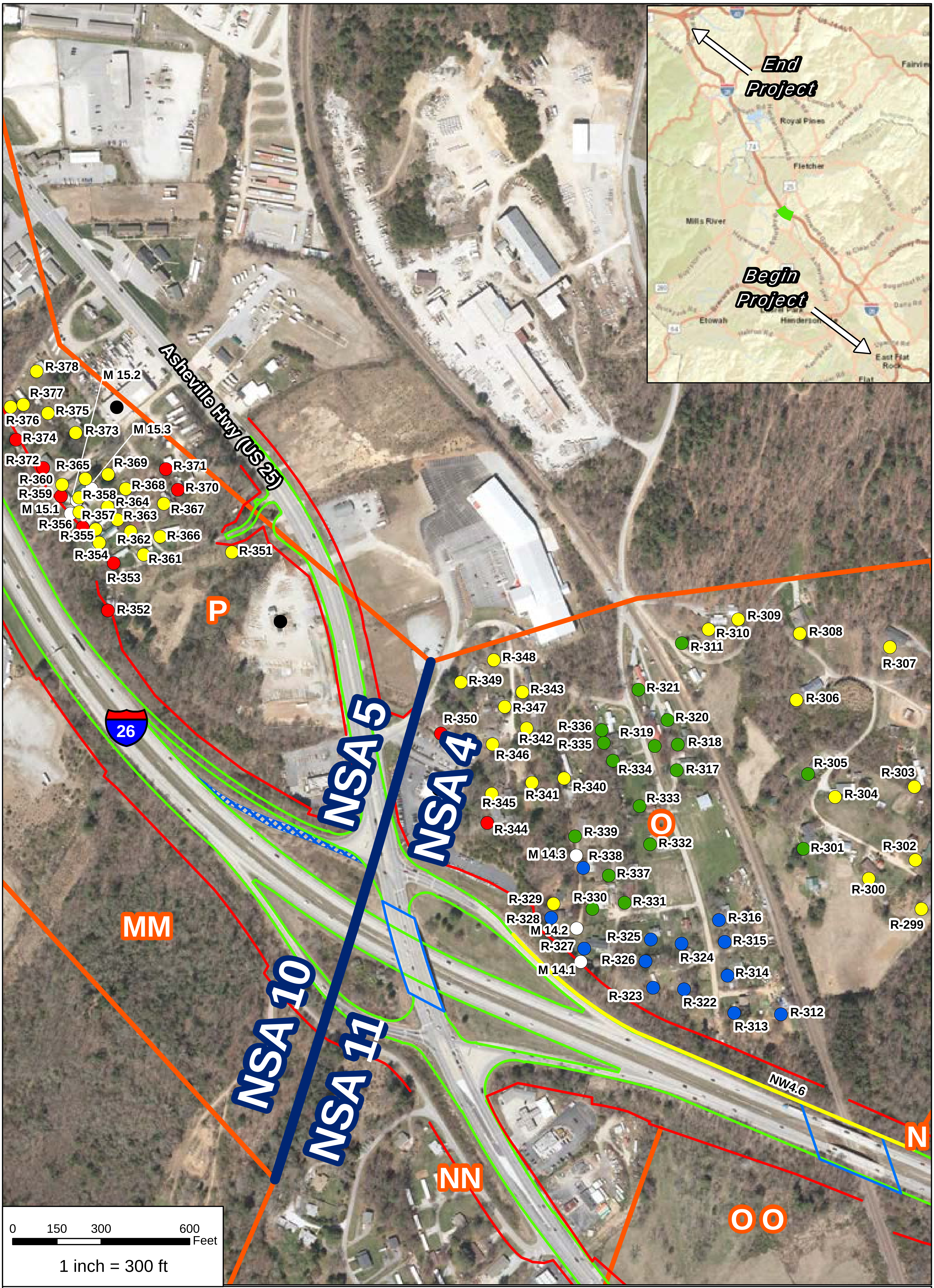
July 2017



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○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 15
NSA 4 (Area O)
NSA 5 (Area P)
Hybrid 6/8-Lane
Widening Alternative

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Legend

🔵 Impacted, Benefited	🟢 Not Impacted, Benefited	○ Monitoring Sites
🔴 Impacted, Not Benefited	🟡 Not Impacted, Not Benefited	● NAC Category F

- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- NSA Boundary
- Preliminary Feasible and Reasonable Noise Wall
- Edge of Pavement
- Proposed Right-of-Way
- Proposed Bridge

Figure 16

NSA 5 (Area P)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

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-Henderson and Buncombe Counties-
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Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- ― NSA Boundary
- ― Preliminary Feasible and Reasonable Noise Wall
- ― Edge of Pavement
- ― Proposed Right-of-Way
- ― Proposed Bridge

Figure 17

NSA 5 (Area Q)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

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-Henderson and Buncombe Counties-
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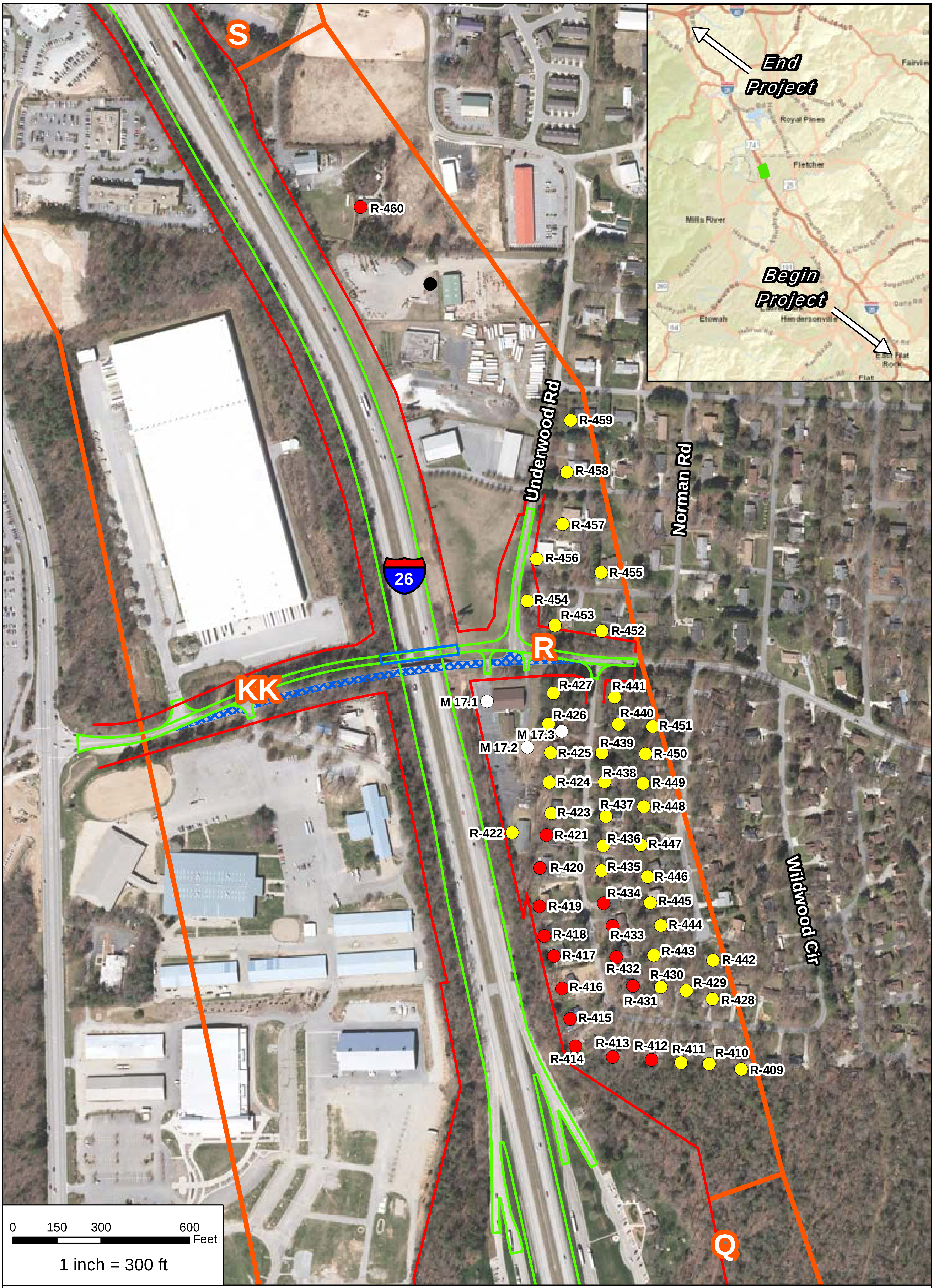

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- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 18

NSA 5 (Area R)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Figure 19

NSA 5 (Area S)
NSA 6 (Area T)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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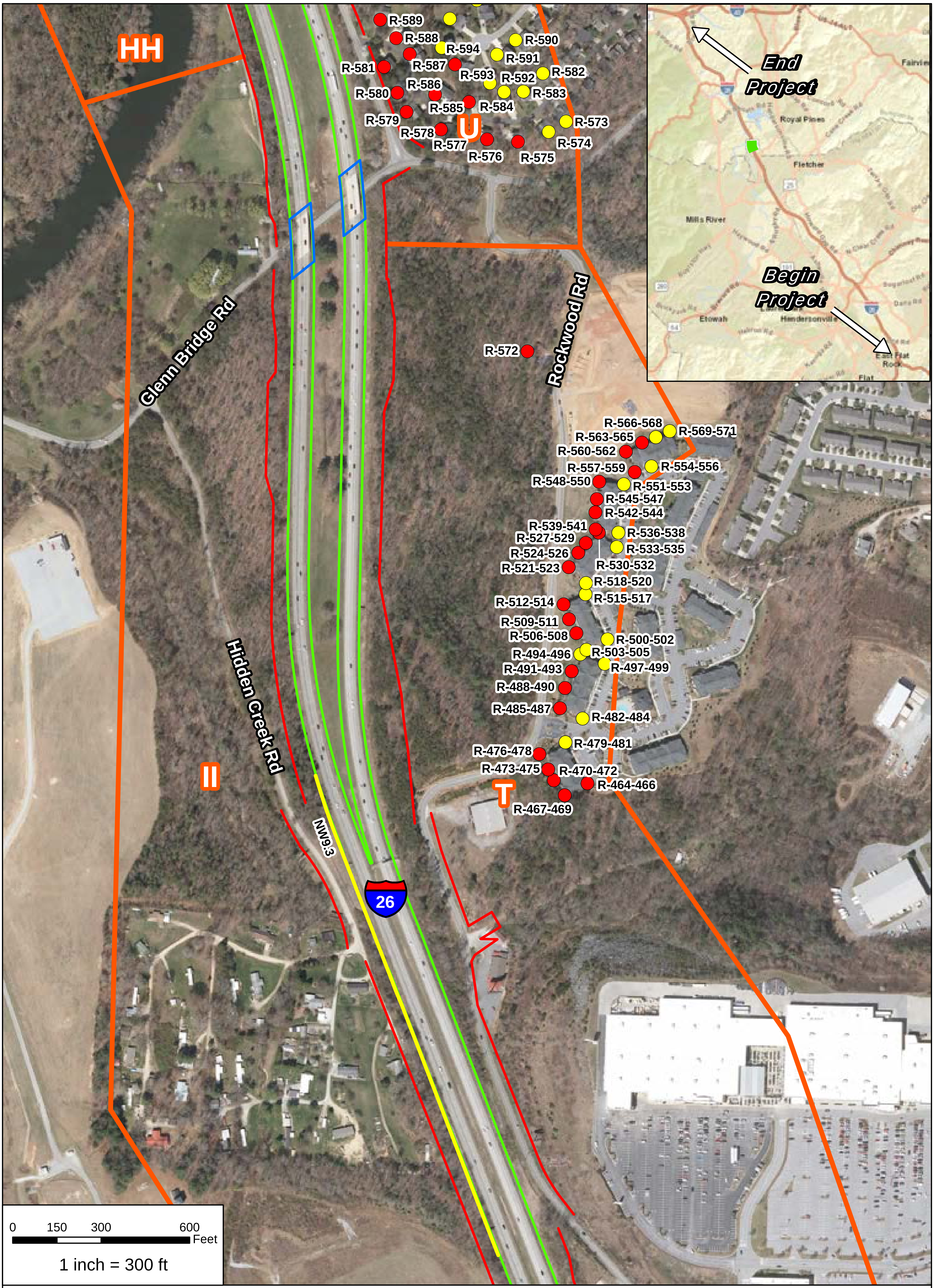

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● Not Impacted, Benefited

● Not Impacted, Not Benefited

○ Monitoring Sites

● NAC Category F

⊗ Acquired as Right-of-Way

▨ Removed Pavement

NSA Boundary

Preliminary Feasible and Reasonable Noise Wall

Edge of Pavement

Proposed Right-of-Way

Proposed Bridge

Figure 20

NSA 6 (Area T)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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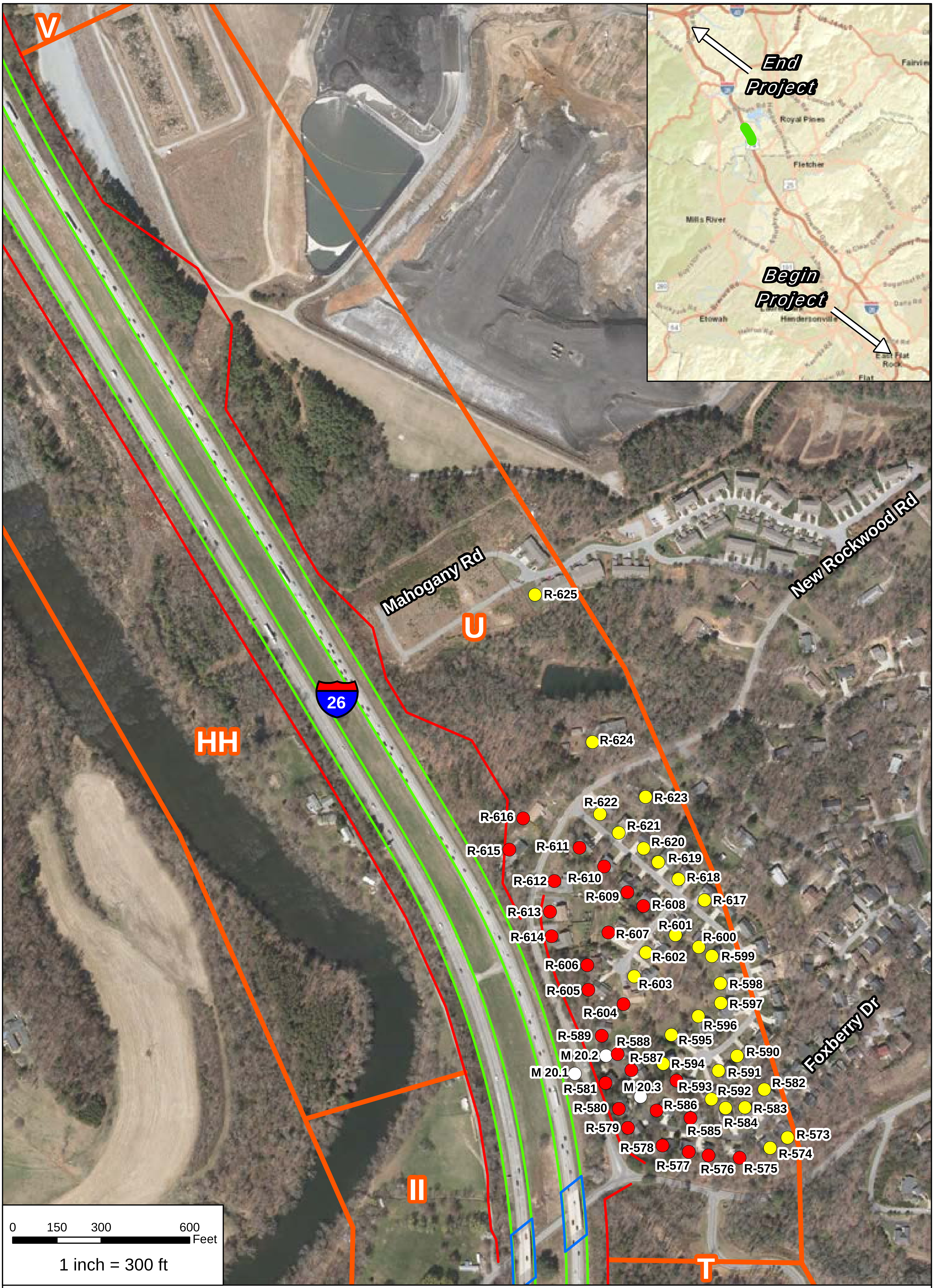

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○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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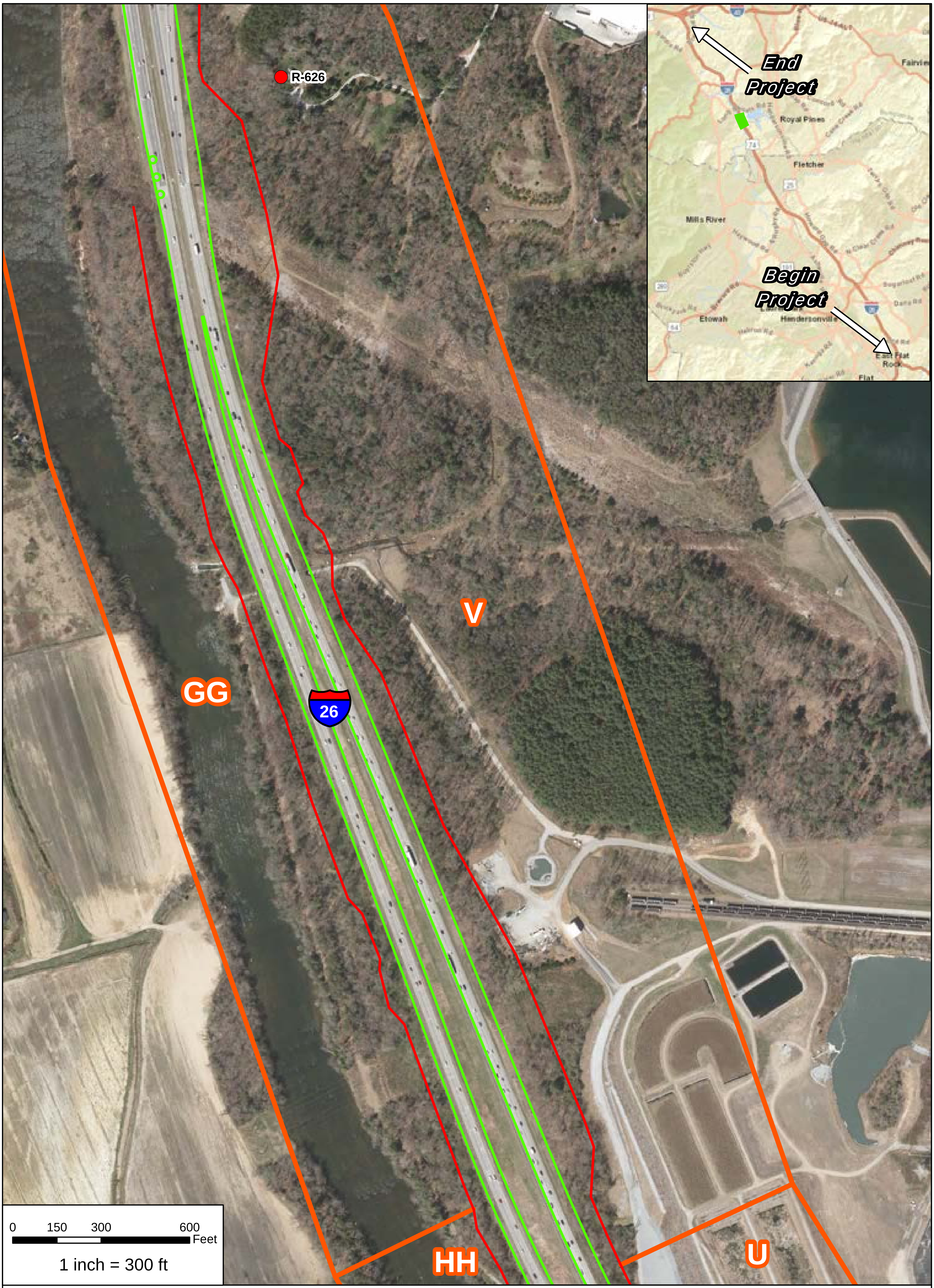
Figure 21

NSA 6 (Area U)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 22

NSA 6 (Area V)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
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Legend

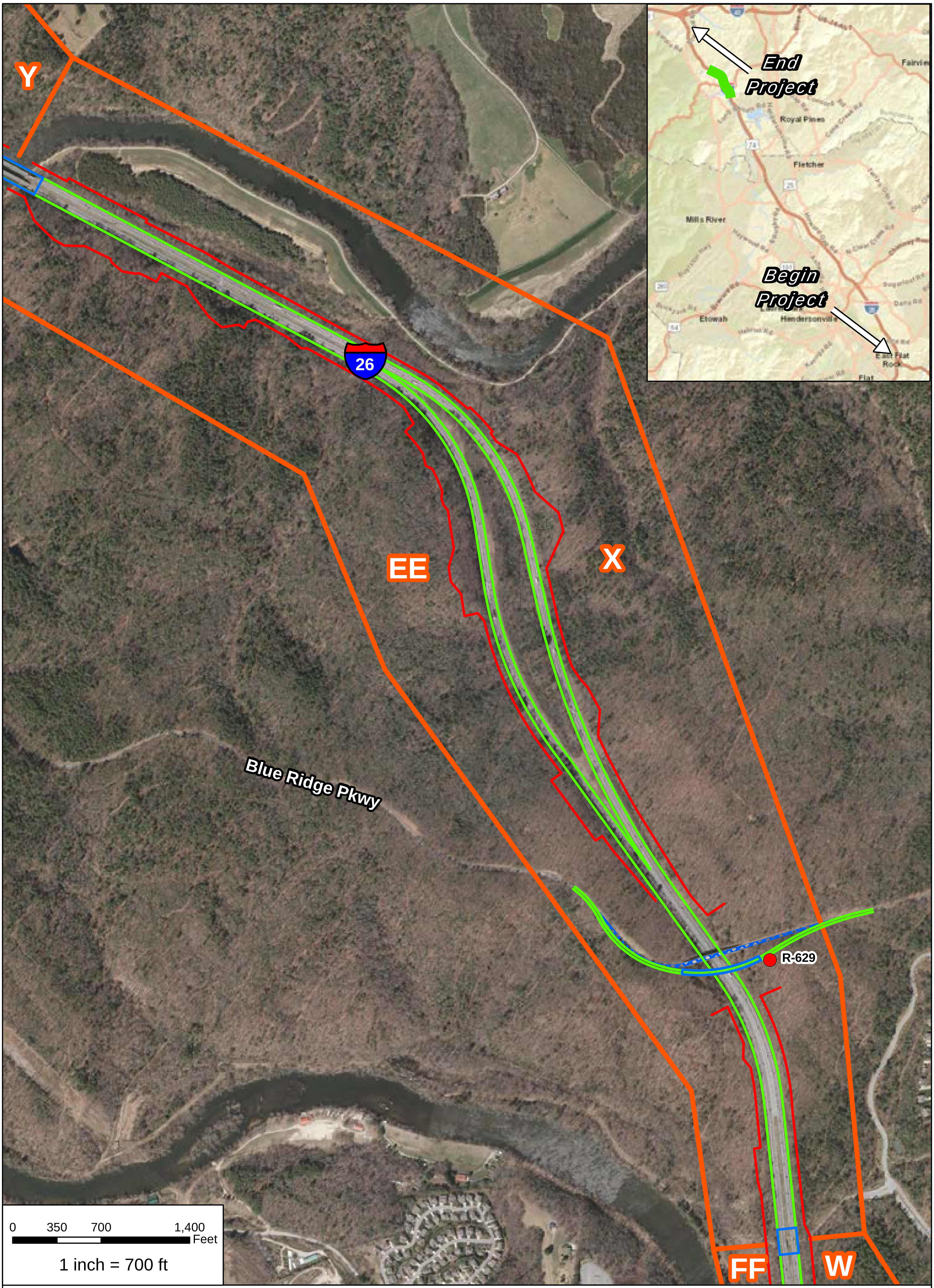
🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 23

NSA 6 (Area V)
NSA 7 (Area W)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 24

NSA 7 (Area X)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

● Impacted, Benefited
● Impacted, Not Benefited
● Not Impacted, Benefited
● Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 25

NSA 7 (Area Y)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
NSA Boundary
Preliminary Feasible and Reasonable Noise Wall
Edge of Pavement
Proposed Right-of-Way
Proposed Bridge

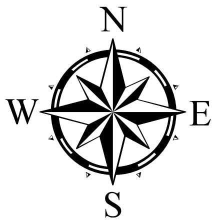


Figure 26

NSA 7 (Area Z)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
NSA Boundary
Preliminary Feasible and Reasonable Noise Wall
Edge of Pavement
Proposed Right-of-Way
Proposed Bridge

Figure 27

NSA 7 (Area AA)
NSA 8 (Area BB)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Legend

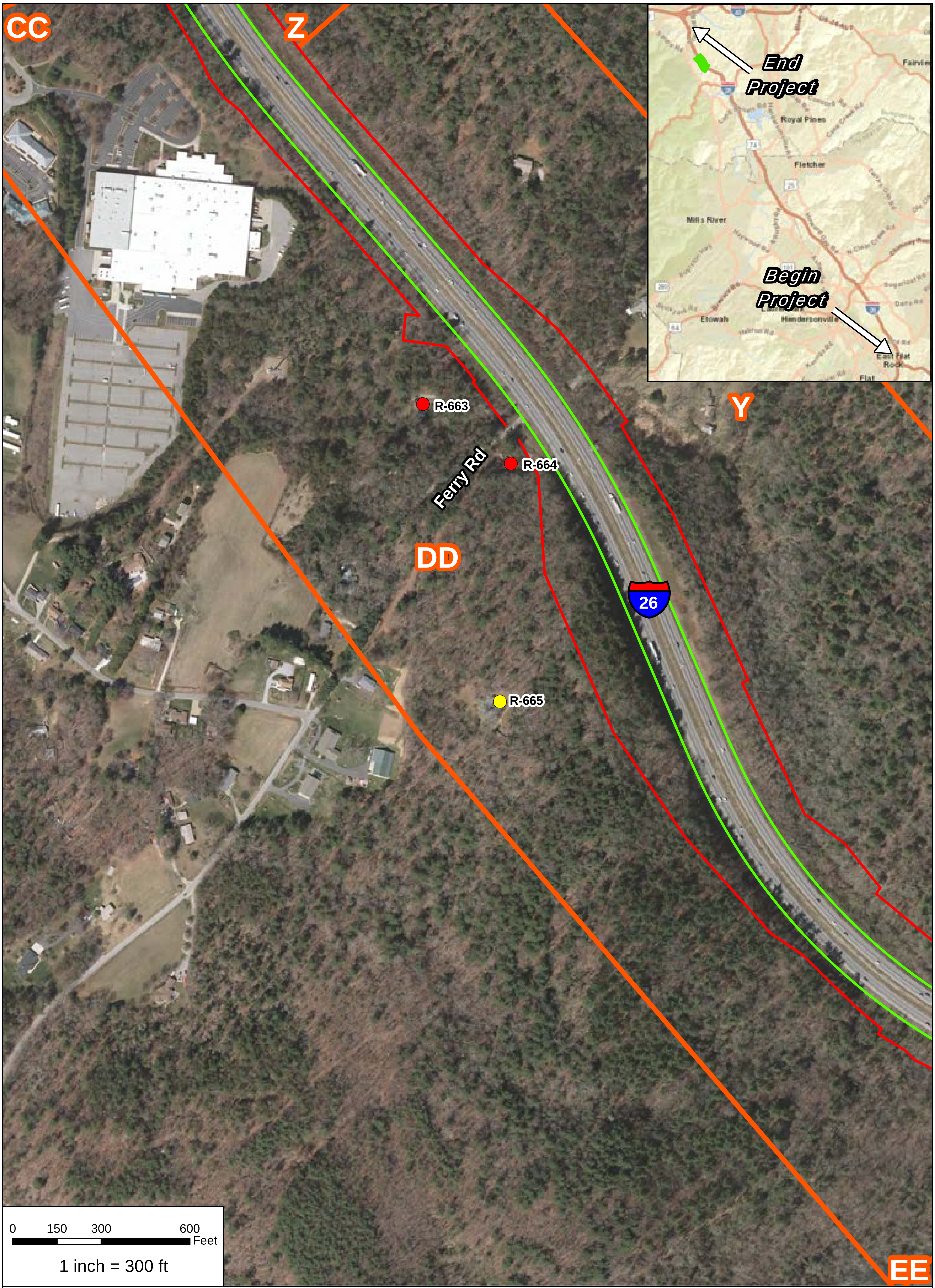
- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 28

NSA 8 (Area CC)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- NSA Boundary
- Preliminary Feasible and Reasonable Noise Wall
- Edge of Pavement
- Proposed Right-of-Way
- Proposed Bridge

Figure 29

NSA 8 (Area DD)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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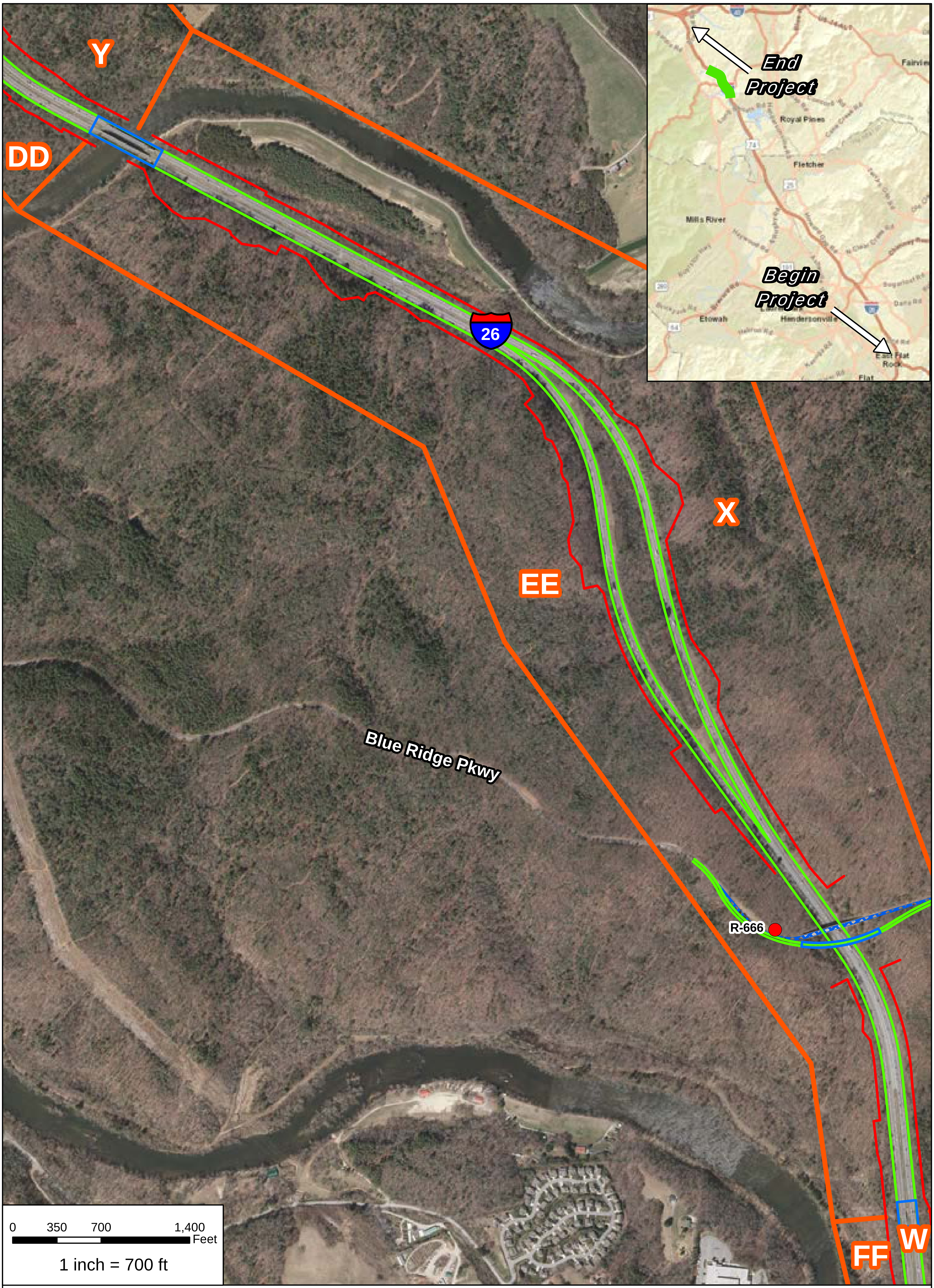
July 2017



Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 30

NSA 8 (Area EE)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 31

NSA 8 (Area FF)
NSA 9 (Area GG)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 32
NSA 9 (Area GG)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700
I-26 Widening
-Henderson and Buncombe Counties-
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Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 33

NSA 9 (Area HH)
NSA 9 (Area II)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 34

NSA 9 (Area II)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

● Impacted, Benefited
● Impacted, Not Benefited
● Not Impacted, Benefited
● Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 35

NSA 9 (Area JJ)
NSA 10 (Area KK)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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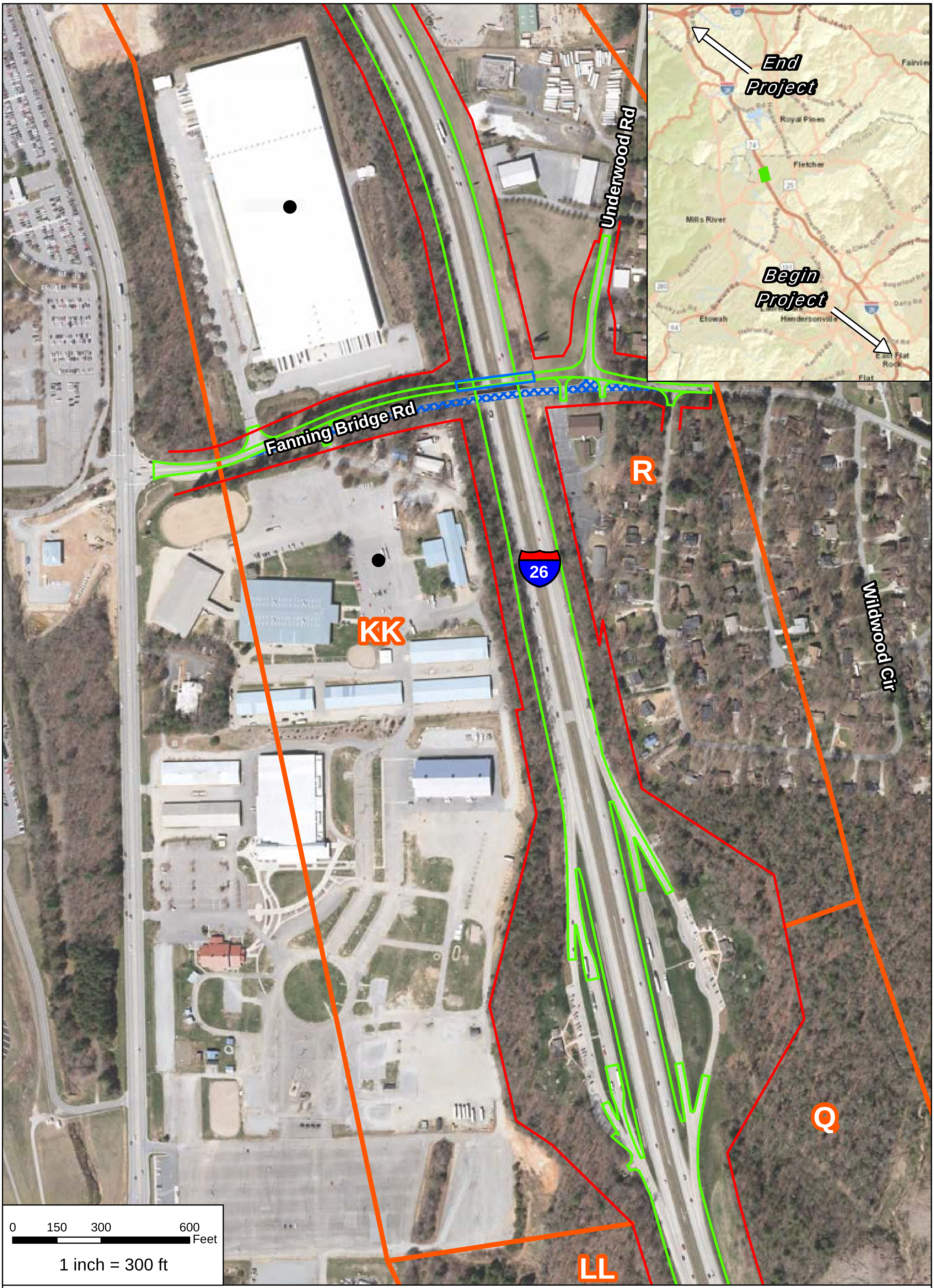
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 36

NSA 10 (Area KK)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 37

NSA 10 (Area LL)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

- ● Impacted, Benefited
- ● Impacted, Not Benefited
- ● Not Impacted, Benefited
- ● Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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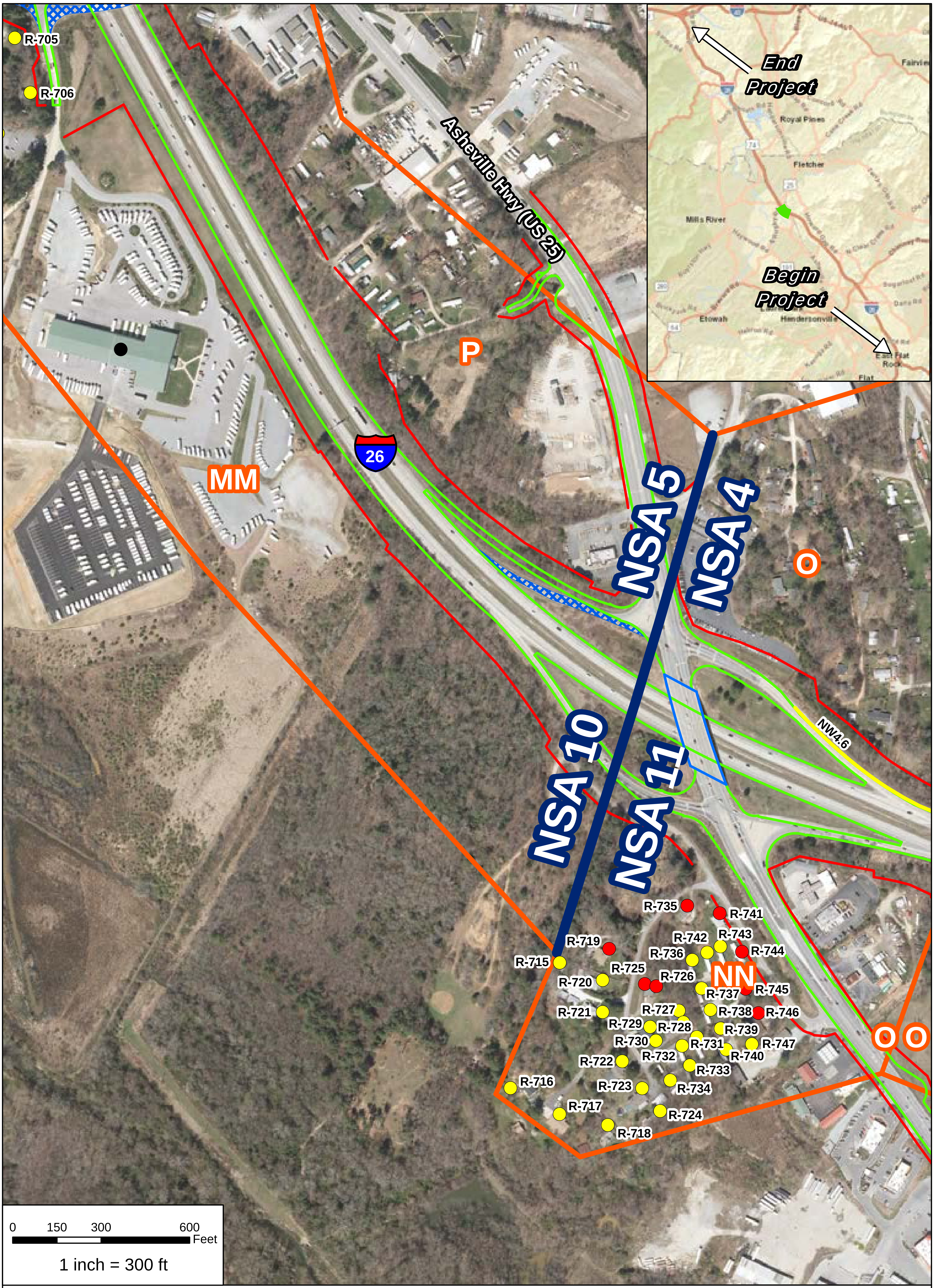
Figure 38

NSA 10 (Area MM)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

- 🔵 Impacted, Benefited
- 🔴 Impacted, Not Benefited
- 🟢 Not Impacted, Benefited
- 🟡 Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 39

NSA 10 (Area MM)
NSA 11 (Area NN)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

🔵 Impacted, Benefited	🟢 Not Impacted, Benefited	○ Monitoring Sites	⊗ Acquired as Right-of-Way
🔴 Impacted, Not Benefited	🟡 Not Impacted, Not Benefited	● NAC Category F	▨ Removed Pavement

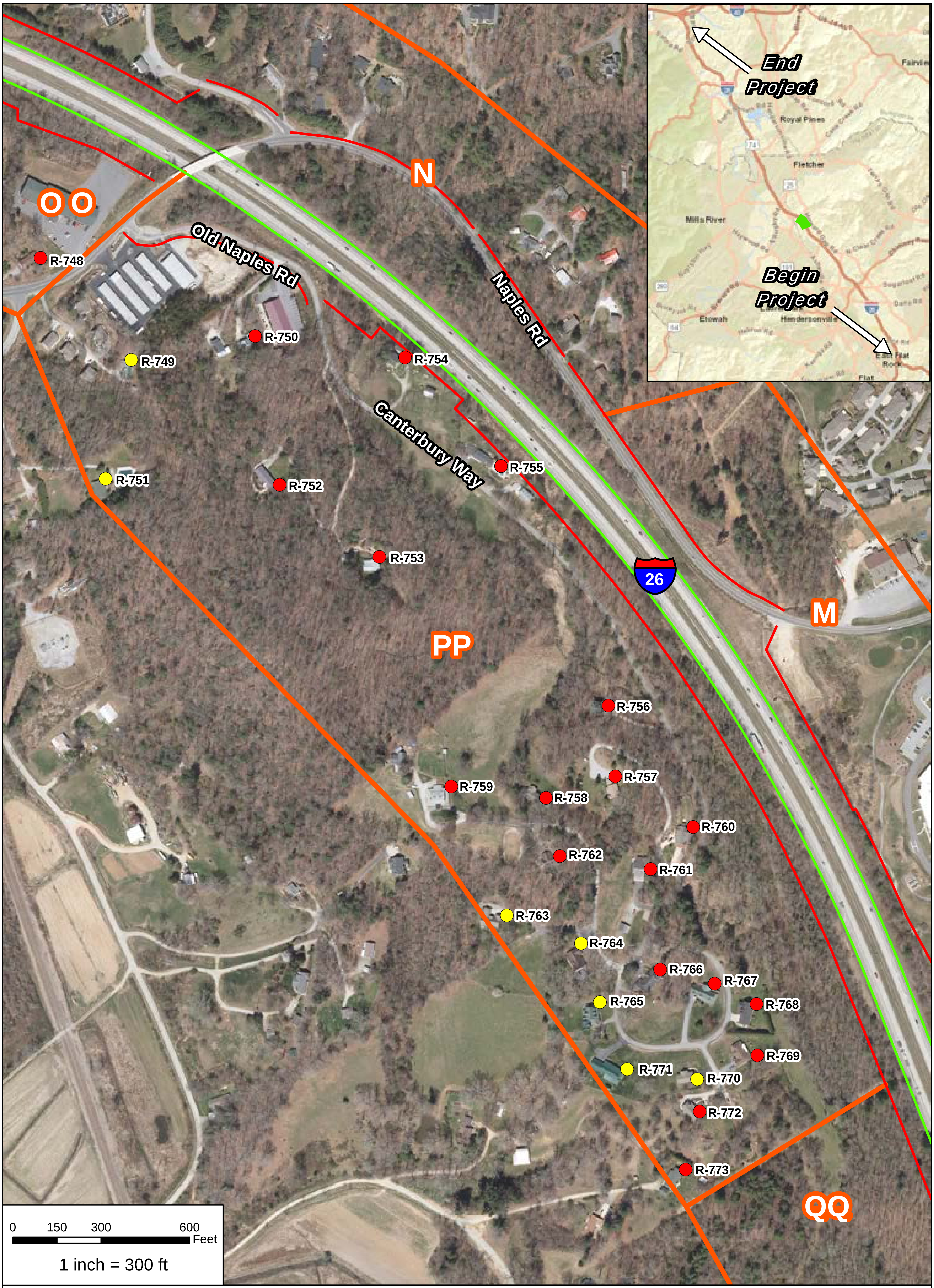
- NSA Boundary
- Preliminary Feasible and Reasonable Noise Wall
- Edge of Pavement
- Proposed Right-of-Way
- Proposed Bridge

Figure 40

NSA 11 (Area OO)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 41

NSA 11 (Area PP)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

● Impacted, Benefited
● Impacted, Not Benefited
● Not Impacted, Benefited
● Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

W N E S

Figure 42

NSA 11 (Area QQ)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

● Impacted, Benefited
● Impacted, Not Benefited
● Not Impacted, Benefited
● Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 43

NSA 11 (Area RR)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Legend

●	Impacted, Benefited	●	Not Impacted, Benefited	○	Monitoring Sites	⊗	Acquired as Right-of-Way
●	Impacted, Not Benefited	●	Not Impacted, Not Benefited	●	NAC Category F	▨	Removed Pavement
						—	NSA Boundary
						—	Preliminary Feasible and Reasonable Noise Wall
						—	Edge of Pavement
						—	Proposed Right-of-Way
						—	Proposed Bridge

Figure 44

NSA 11 (Area RR)
NSA 12 (Area SS)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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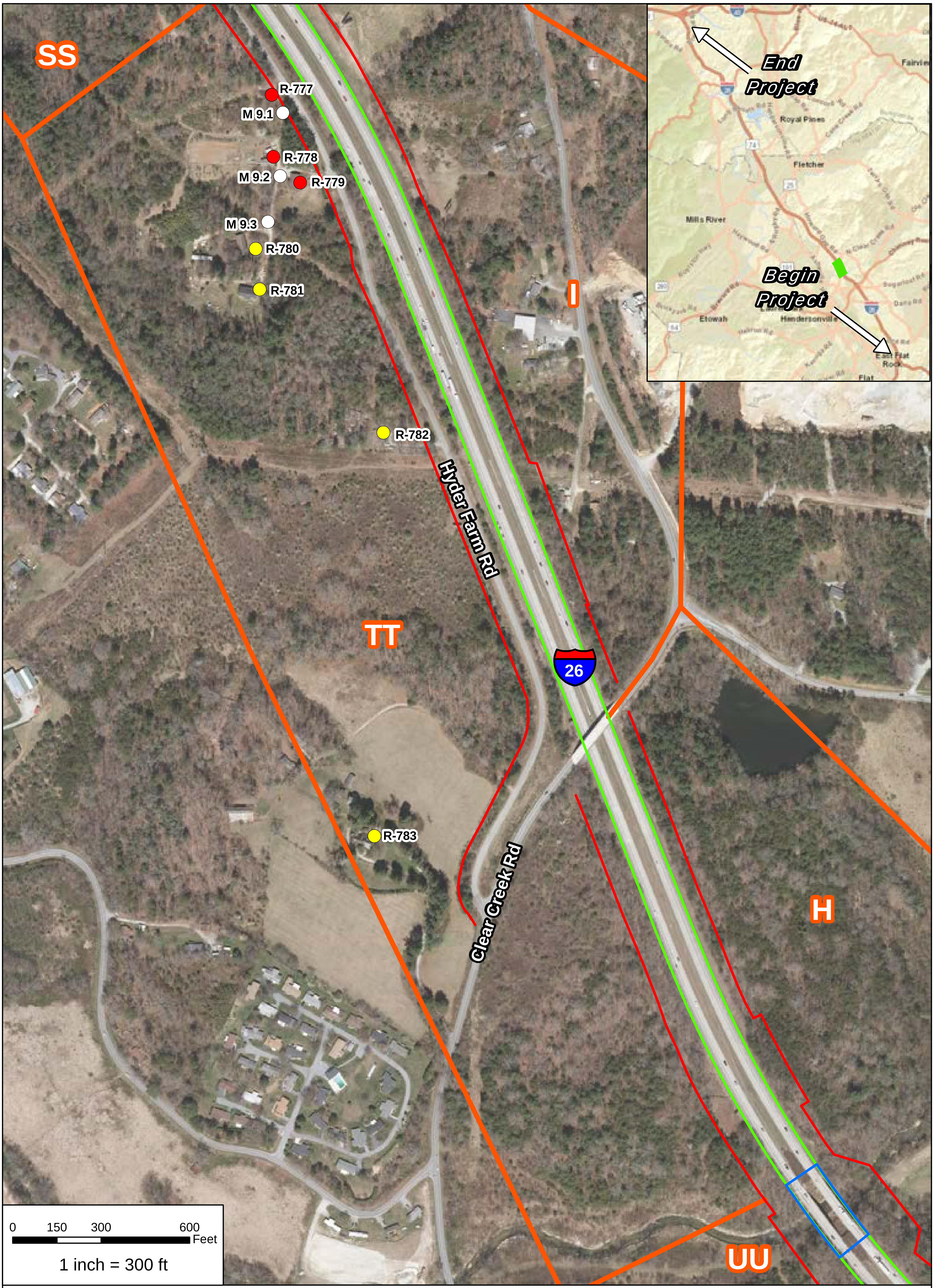
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

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Figure 45

NSA 12 (Area TT)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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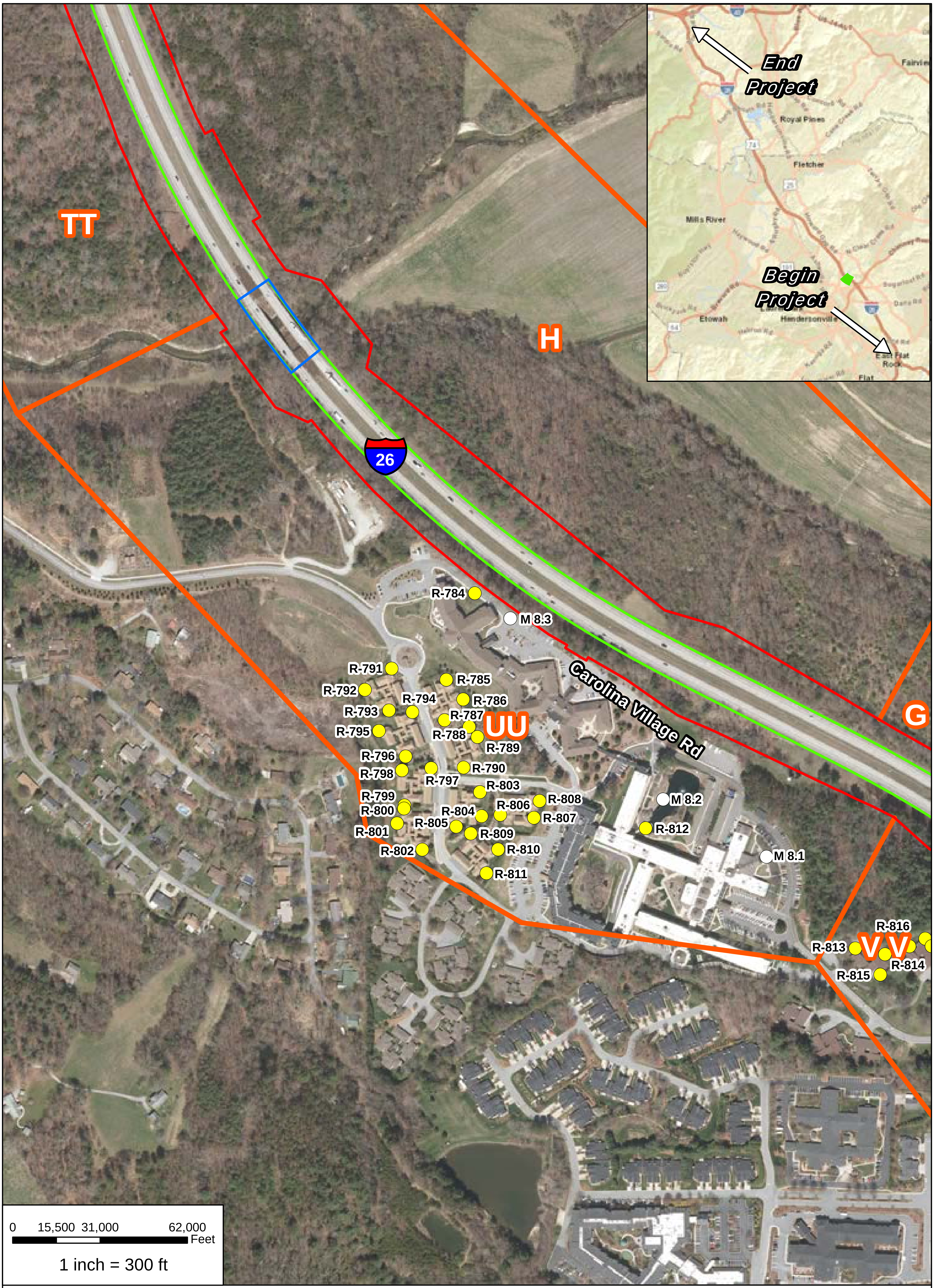
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 46

NSA 12 (Area UU)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 47

NSA 12 (Area VV)
NSA 13 (Area WW)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 48

NSA 13 (Area WW)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017

Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
○ Monitoring Sites
● NAC Category F
⊗ Acquired as Right-of-Way
▨ Removed Pavement
NSA Boundary
Preliminary Feasible and Reasonable Noise Wall
Edge of Pavement
Proposed Right-of-Way
Proposed Bridge

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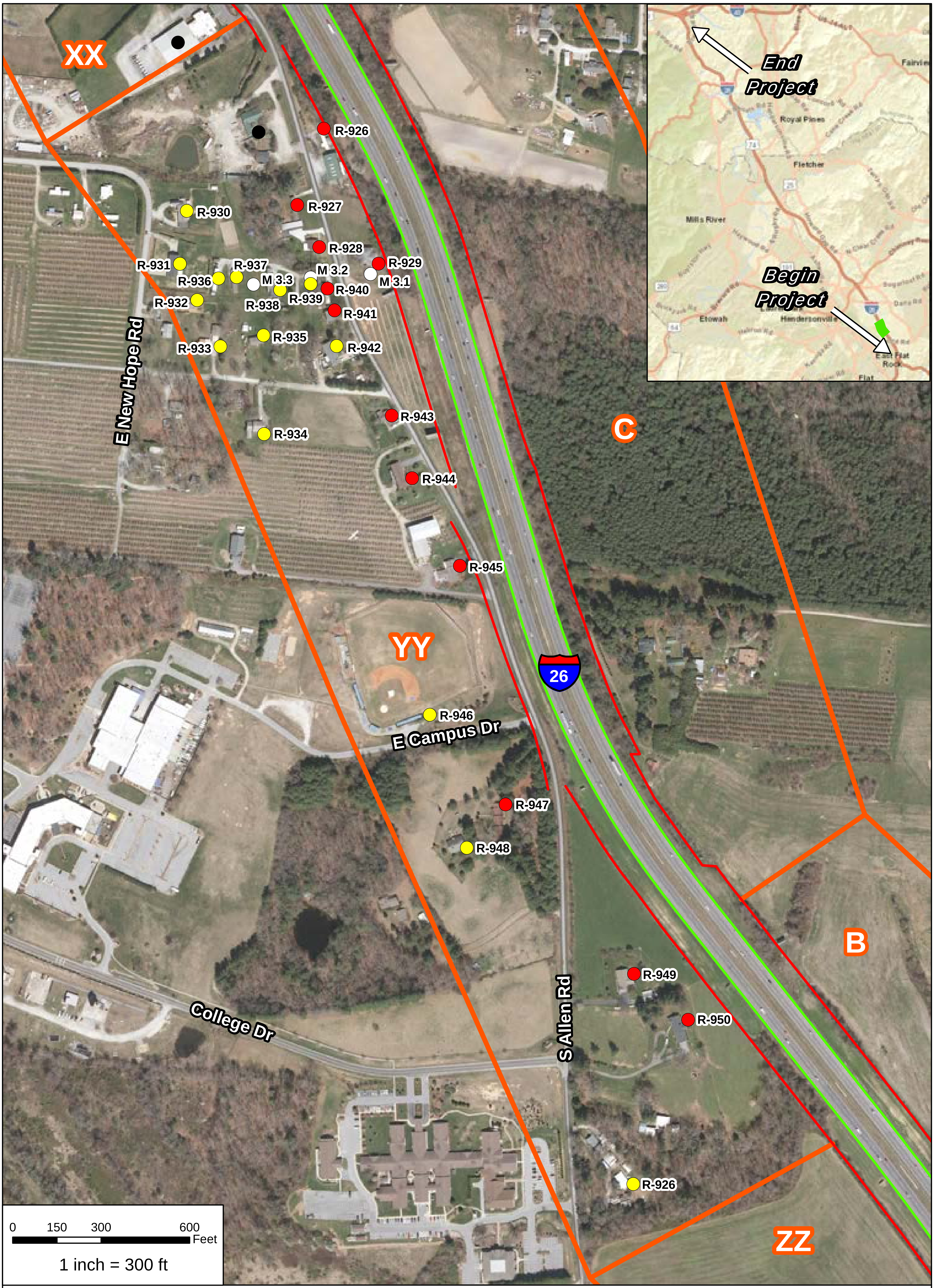
Figure 49

NSA 13 (Area XX)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
Traffic Noise Report
July 2017



Legend

🔵	Impacted, Benefited	🟢	Not Impacted, Benefited	○	Monitoring Sites	⊗	Acquired as Right-of-Way
🔴	Impacted, Not Benefited	🟡	Not Impacted, Not Benefited	●	NAC Category F	▦	Removed Pavement

- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 50

NSA 13 (Area YY)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Legend

- ● Impacted, Benefited
- ● Impacted, Not Benefited
- ● Not Impacted, Benefited
- ● Not Impacted, Not Benefited
- ○ Monitoring Sites
- ● NAC Category F
- ⊗ Acquired as Right-of-Way
- ▨ Removed Pavement
- — NSA Boundary
- — Preliminary Feasible and Reasonable Noise Wall
- — Edge of Pavement
- — Proposed Right-of-Way
- — Proposed Bridge

Figure 51

NSA 13 (Area ZZ)
NSA 14 (Area AAA)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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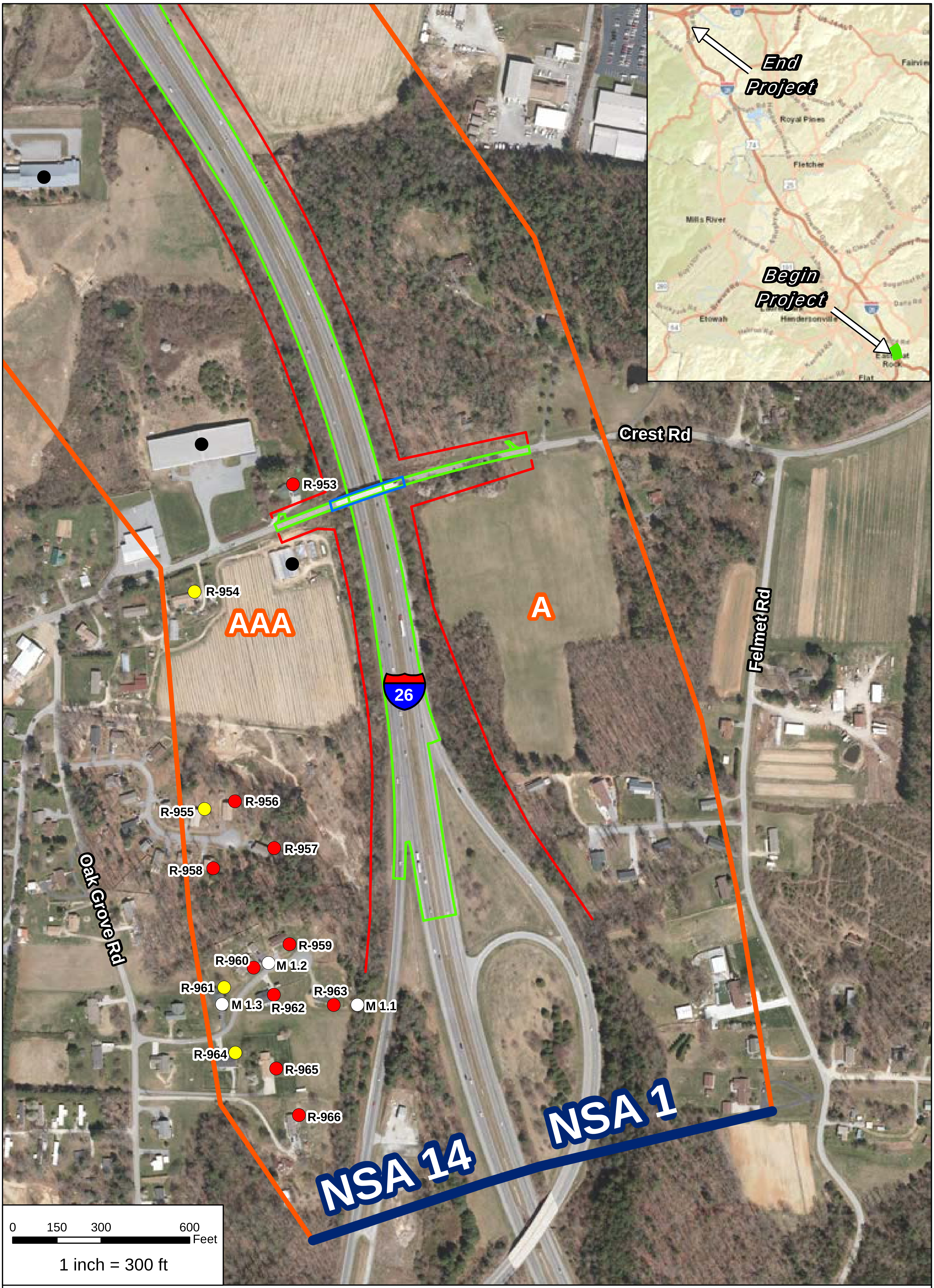
July 2017



Legend

🔵 Impacted, Benefited
🔴 Impacted, Not Benefited
🟢 Not Impacted, Benefited
🟡 Not Impacted, Not Benefited
⚪ Monitoring Sites
⚫ NAC Category F
⊗ Acquired as Right-of-Way
▦ Removed Pavement
— NSA Boundary
— Preliminary Feasible and Reasonable Noise Wall
— Edge of Pavement
— Proposed Right-of-Way
— Proposed Bridge

Figure 52

NSA 14 (Area AAA)
Hybrid 6/8-Lane
Widening Alternative

STIP # I-4400/I-4700

I-26 Widening
-Henderson and Buncombe Counties-
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Appendix A

Ambient Noise Level Monitoring

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Table A-1: Project Ambient Hourly-Equivalent Sound Levels, Leq(h)[1]

Setup	Receptor	Land Use	Roadway Noise Source(s)[2]	Start/Stop Time	$L_{eq(h)}$ dB(A)
0	0.1	Residential	I-26	11:45 – 12:05	63.6
	0.2	Residential	I-26		57.9
	0.3	Residential	I-26		56.2
1	1.1	Residential	I-26	10:30 – 10:50	64.6
	1.2	Residential	I-26		55.3
	1.3	Residential	I-26		53.4
2	2.1	Restaurant	I-26	9:35 – 9:55	59.7
	2.2	Retail	I-26		58.3
	2.3	Hotel	I-26		56.7
3	3.1	Com. Center	I-26	8:50 – 9:10	62.0
	3.2	Residential	I-26		56.7
	3.3	Residential	I-26		52.0
4	4.1	Residential	I-26	16:30 – 16:50	63.9
	4.2	Residential	I-26		55.1
	4.3	Residential	I-26		51.9
5	5.1	Residential	I-26	15:35 – 15:55	65.0
	5.2	Residential	I-26		60.2
	5.3	Residential	I-26		55.2
6	6.1	Residential	I-26	17:10 – 17:30	69.4
	6.2	Residential	I-26		61.6
	6.3	Residential	I-26		58.2
7	7.1	Residential	I-26	14:00 – 14:20	62.8
	7.2	Residential	I-26		56.3
	7.3	Residential	I-26		54.1
8	8.1	Residential	I-26	11:25 – 11:45	59.9
	8.2	Residential	I-26		61.1
	8.3	Residential	I-26		69.1
9	9.1	Residential	I-26	9:50 – 10:10	69.2
	9.2	Residential	I-26		62.1
	9.3	Residential	I-26		59.2
10	10.1	Residential	I-26	9:00 – 9:20	64.6
	10.2	Residential	I-26		63.1
	10.3	Residential	I-26		59.1
11	11.1	Residential	I-26	17:30 – 17:50	65.9
	11.2	Residential	I-26		59.9
	11.3	Residential	I-26		60.3
12	12.1	Residential	I-26	16:45 – 17:05	62.4
	12.2	Residential	I-26		58.5
	12.3	Residential	I-26		54.0

[1] In accordance with FHWA guidance and accepted industry standards, hourly equivalent sound levels, $L_{eq(h)}$,were extrapolated from short-term data collection monitoring sessions and are expressed in units of A-weighted decibels (dB(A)) rounded to the nearest whole number.

Table A-1: Project Ambient Hourly-Equivalent Sound Levels, Leq(h)[1]

Setup	Receptor	Land Use	Roadway Noise Source(s)[2]	Start/Stop Time	$L_{eq(h)}$ dB(A)
13	13.1	Hospital	I-26	16:00 – 16:20	67.4
	13.2	Hospital	I-26		69.2
	13.3	Hospital	I-26		64.1
14	14.1	Residential	I-26	14:30 – 14:50	62.6
	14.2	Residential	I-26		60.3
	14.3	Residential	I-26		55.8
15	15.1	Residential	I-26	11:00 – 11:20	61.6
	15.2	Residential	I-26		58.1
	15.3	Residential	I-26		56.0
16	16.1	Residential	I-26	9:40 – 10:00	69.3
	16.2	Residential	I-26		63.3
	16.3	Residential	I-26		62.3
17	17.1	Church	I-26	14:35 – 14:55	68.6
	17.2	Church	I-26		61.8
	17.3	Residential	I-26		54.6
18	18.1	Hotel	I-26	13:30 – 13:50	67.9
	18.2	Hotel	I-26		65.8
	18.3	Hotel	I-26		68.0
19	19.1	Residential	I-26	15:50 – 16:10	67.5
	19.2	Residential	I-26		66.0
	19.3	Residential	I-26		62.0
20	20.1	Residential	I-26	16:55 – 17:15	76.0
	20.2	Residential	I-26		66.4
	20.3	Residential	I-26		62.3
21	21.1	Hotel	I-26	18:05 – 18:25	66.8
	21.2	Hotel	I-26		59.1
	21.3	Hotel	I-26		54.5
22	22.1	Residential	I-26	9:05 – 9:25	62.1
	22.2	Residential	I-26		59.4
	22.3	Residential	I-26		56.6
23	23.1	Retail	I-26	10:15 – 10:35	70.3
	23.2	Retail	I-26		69.0
	23.3	Retail	I-26		65.2
24	24.1	Residential	I-26	11:55 – 12:15	63.9
	24.2	Residential	I-26		64.3
	24.3	Residential	I-26		60.2
25	25.1	Residential	I-26	14:40 – 15:00	69.5
	25.2	Residential	I-26		61.9
	25.3	Residential	I-26		60.0

[1] In accordance with FHWA guidance and accepted industry standards, hourly equivalent sound levels, $L_{eq(h)}$,were extrapolated from short-term data collection monitoring sessions and are expressed in units of A-weighted decibels (dB(A)) rounded to the nearest whole number.

Table A-1: Project Ambient Hourly-Equivalent Sound Levels, Leq(h)[1]

Setup	Receptor	Land Use	Roadway Noise Source(s)[2]	Start/Stop Time	$L_{eq(h)}$ dB(A)
26	26.1	Residential	I-26	16:10 – 16:30	64.0
	26.2	Residential	I-26		61.5
	26.3	Residential	I-26		56.5

[1] In accordance with FHWA guidance and accepted industry standards, hourly equivalent sound levels, $L_{eq(h)}$,were extrapolated from short-term data collection monitoring sessions and are expressed in units of A-weighted decibels (dB(A)) rounded to the nearest whole number.

Table A-2: Project Noise Monitoring Sessions Weather Data[1]

Setup	Temp. (°F)	Dew Point (°F)	Pressure (in)	Wind Dir.	Wind Speed (mph)	Relative Humidity	Precip. (in)
0	77	62	29.81	SE	1	68%	0.00
1	85	63	29.81	E/NE	4	70%	0.00
2	72	63	29.82	NE	5	78%	0.00
3	72	64	29.83	E	3	81%	0.00
4	82	64	29.84	NW	1	66%	0.00
5	82	61	29.85	-	Calm	65%	0.00
6	82	63	29.83	S/SW	5	72%	0.00
7	84	60	29.91	W	1	60%	0.00
8	79	63	30.00	SE	2	69%	0.00
9	72	61	29.99	SW	1	86%	0.00
10	66	61	29.99	SW	1	97%	0.00
11	81	60	30.02	E	4	61%	0.00
12	77	60	30.04	S/SE	3	70%	0.00
13	76	62	30.10	E	4	71%	0.00
14	76	62	30.06	E	5	70%	0.00
15	70	54	30.25	-	Calm	41%	0.00
16	60	55	30.26	-	Calm	55%	0.00
17	75	55	30.21	SE	1	68%	0.00
18	73	55	30.27	-	Calm	74%	0.00
19	77	53	30.18	NE	3	37%	0.00
20	78	54	30.15	-	Calm	37%	0.00
21	76	54	30.13	-	Calm	37%	0.00
22	70	57	30.13	-	Calm	41%	0.00
23	70	57	30.12	NE	3	70%	0.00
24	72	60	30.11	SE	3	75%	0.00
25	81	63	29.83	SE	5	59%	0.00
26	76	63	29.83	S	2	74%	0.00

[1] Source: Weather Underground (http://www.wunderground.com) for the local weather station.

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 0.1-3 DATE: 6/5/14 TIME: 11:45-12:05

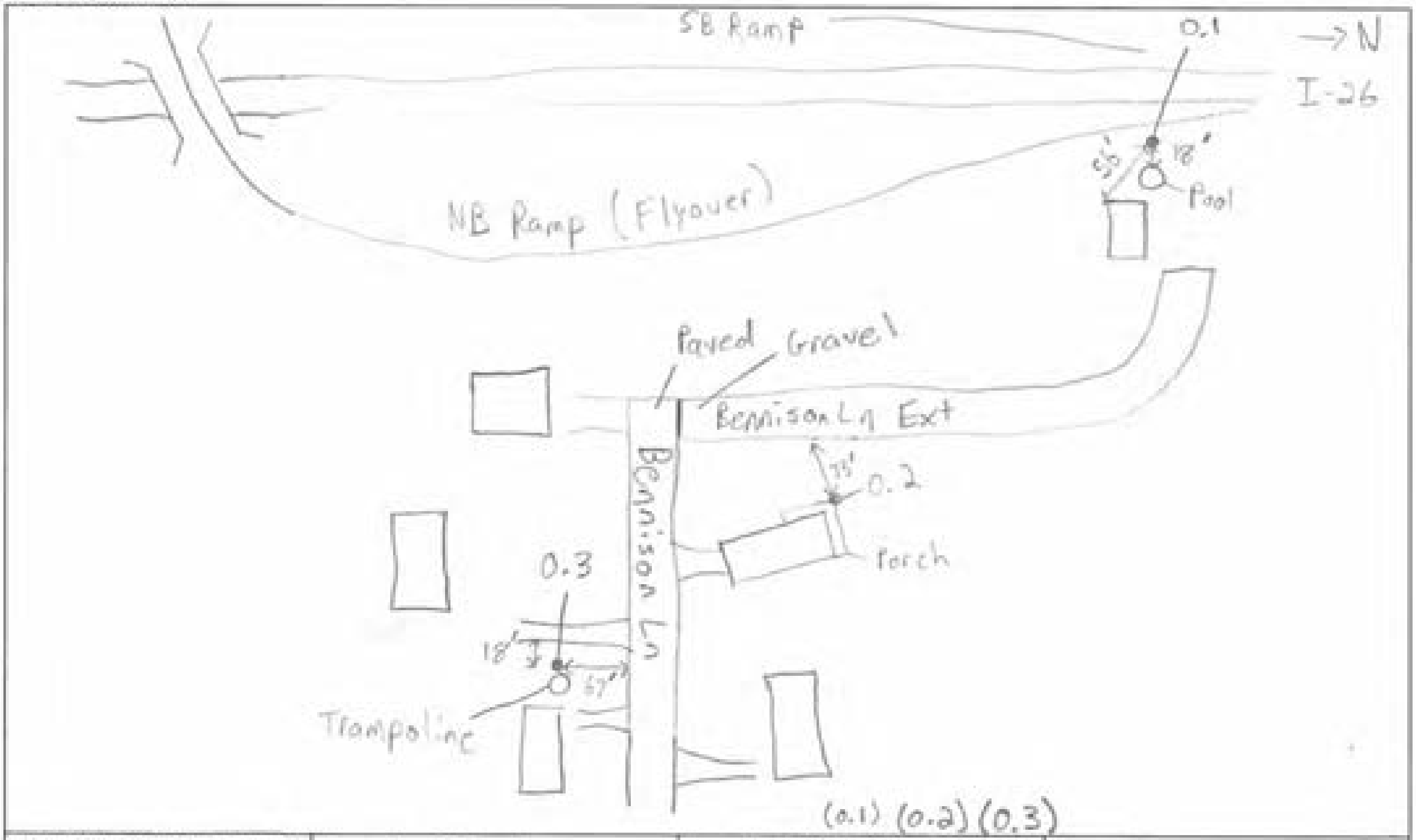
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

NB Ramp	TRAFFIC DATA			SB Ramp
	ROAD (Name/Dir)		I-26	
136	AUTOS	___EB ___WB	333 NB 250 SB	99
4	MED TRKS	___EB ___WB	21 NB 11 SB	4
10	HVY TRKS	___EB ___WB	80 NB 76 SB	16
0	BUS	___EB ___WB	0 NB 0 SB	0
0	MOTORCYCLE	___EB ___WB	0 NB 1 SB	0
	SPEED		65	

EQUIPMENT	
INSTRUMENT	See "Other Notes"
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type ~~1251~~ NC-74	34536122

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) (0.1) (0.2) (0.3) 63.6, 57.9, 56.2

WEATHER DATA WIND SPEED (MPH) 1 DIR. SE TEMP. 77° HUMIDITY 68% CLOUD COVER Mostly Cloudy

BACKGROUND NOISE Dogs Barking, Birds

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES For all 3 noise meters used throughout project, SLM Manufacturer is Rion
↳ Model is NL-32

For each site:

Meter X.1 – SLM 01161900, Preamplifier (Type NH-21) 21933, Microphone (Type UC-53 A) 311130
Meter X.2 – " 00282514 " 26713 " 313875
Meter X.3 – " 01161899 " 21932 " 311127

Noise Monitoring Site 0

Bennison Ln – Single Family Residential

Noise Meter 0.1 Looking Southwest

Noise Meter 0.2 Looking East

Noise Meter 0.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 1.1-3 DATE: 6/5/14 TIME: 10:30-10:50

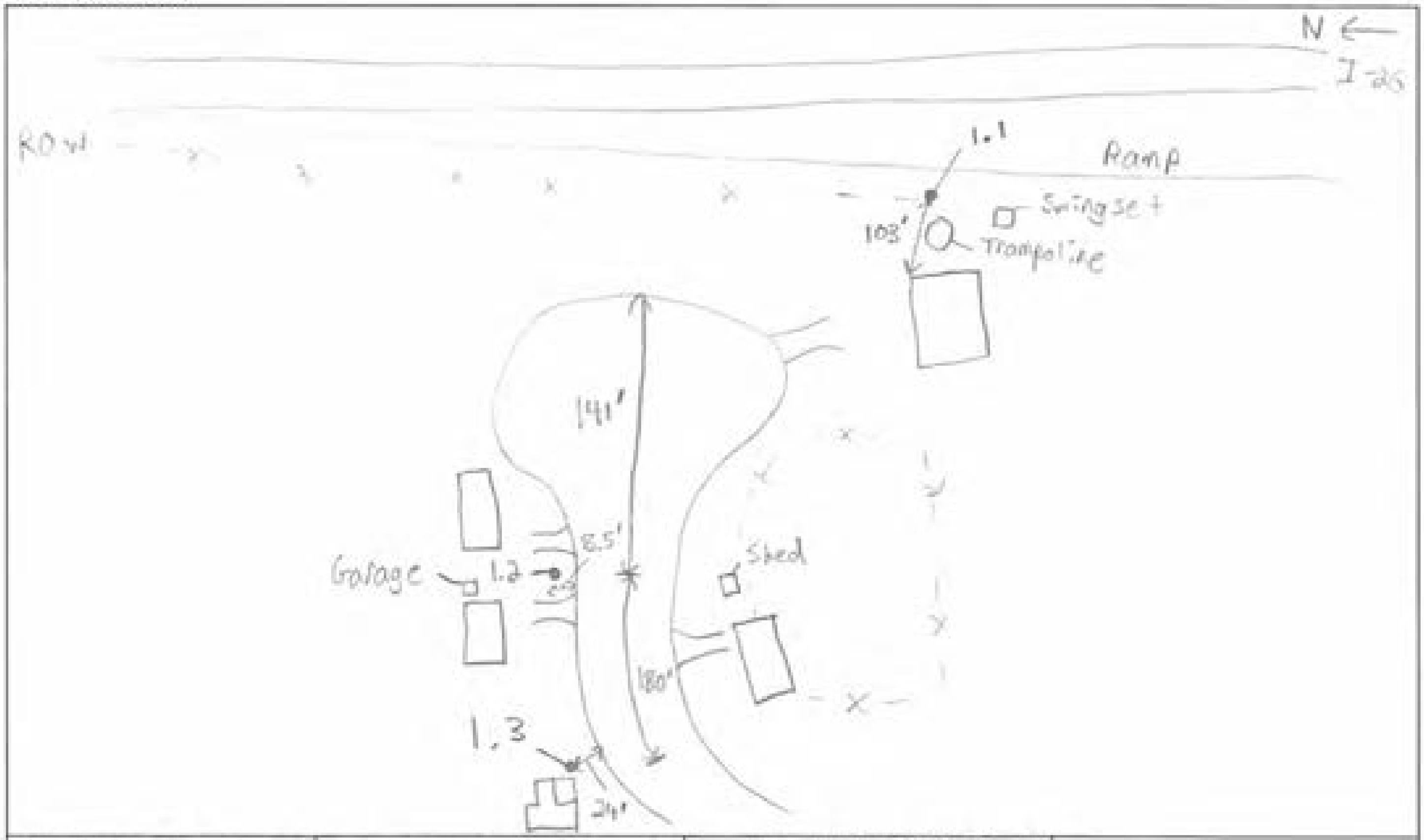
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA			RAMP
ROAD (Name/Dir)		I-26	
AUTOS	___EB ___WB	289 NB 222 SB	86
MED TRKS	___EB ___WB	13 NB 11 SB	4
HVY TRKS	___EB ___WB	54 NB 51 SB	18
BUS	___EB ___WB	0 NB 0 SB	0
MOTORCYCLE	___EB ___WB	6 NB 0 SB	0
SPEED		65	55

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 64.6, 55.3, 53.4	

WEATHER DATA WIND SPEED (MPH) 4 DIR. E/NE TEMP. 85° HUMIDITY 70% CLOUD COVER Partly Cloudy

BACKGROUND NOISE __________

MAJOR SOURCES __________

UNUSUAL EVENTS __________

OTHER NOTES __________

Noise Monitoring Site 1

Hollyhock Ct – Single Family Residential

Noise Meter 1.1 Looking Southeast

Noise Meter 1.2 Looking East

Noise Meter 1.3 Looking Northwest

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 2.1-3 DATE: 6/5/14 TIME: 9:35-9:55

CALIBRATION: 94.0 dB.

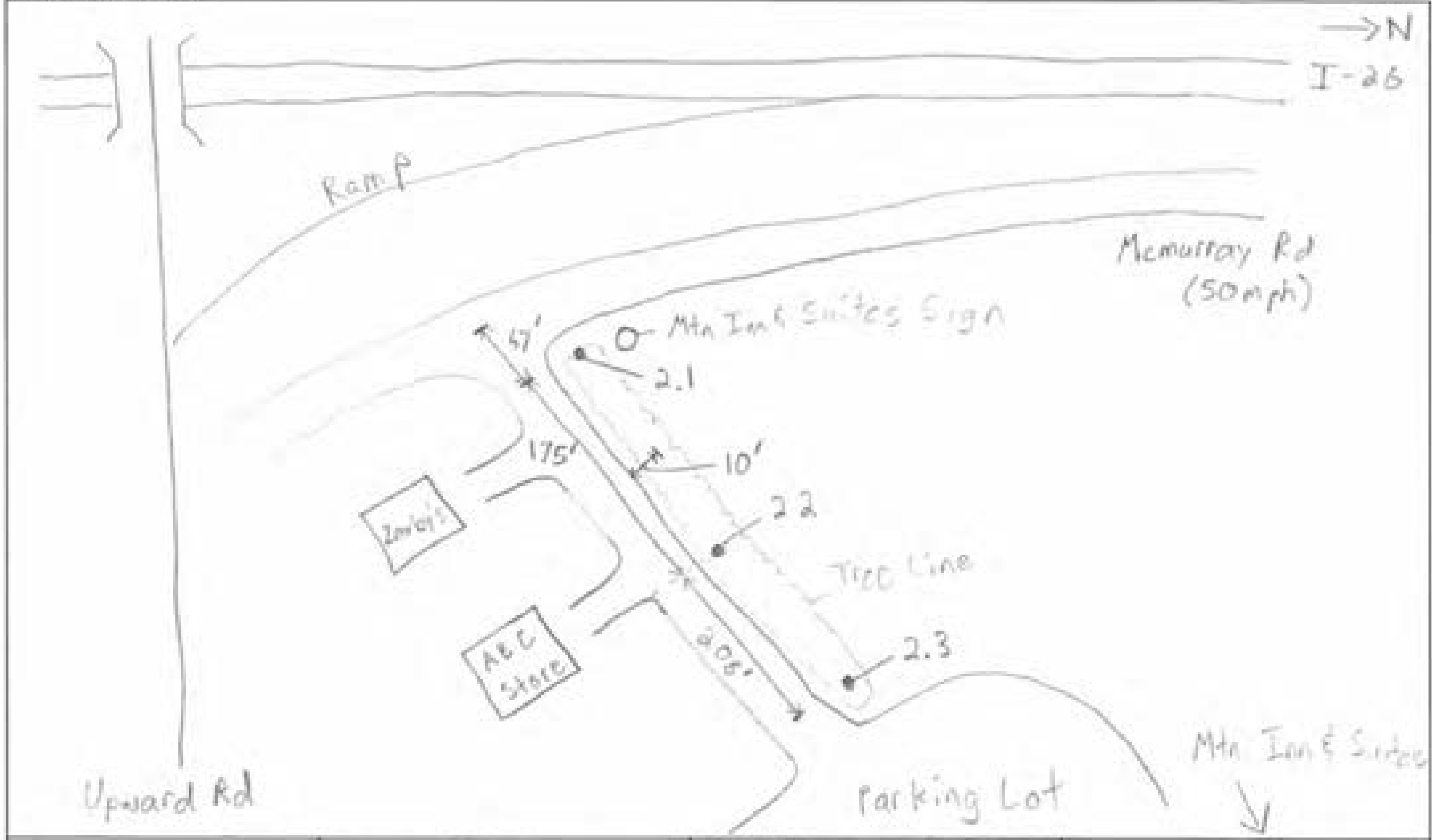
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

Mcmurray		TRAFFIC DATA		RAMP
	ROAD (Name/Dir)	Upward Rd	I-26	
17	AUTOS	90 EB 132 WB	333 NB 271 SB	86
2	MED TRKS	3 EB 2 WB	15 NB 18 SB	1
0	HVY TRKS	3 EB 2 WB	70 NB 71 SB	3
0	BUS	0 EB 0 WB	1 NB 1 SB	0
0	MOTORCYCLE	0 EB 0 WB	3 NB 2 SB	1
50	SPEED	35	65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 59.7, 58.3, 56.7	

WEATHER DATA WIND SPEED (MPH) 5 DIR. NE TEMP. 72° HUMIDITY 78% CLOUD COVER Partly

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Car (4'), Heavy Truck (10-11'), Car (13'), 2 cars (19')

OTHER NOTES

Pictures - 2.3, 2.2, 2.1

Note - Upward WB includes turns onto ramp

Noise Monitoring Site 2

McMurray Rd – Commercial

Noise Meter 2.1 Looking West

Noise Meter 2.2 Looking East

Noise Meter 2.3 Looking Northeast

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 3.1-3.3 DATE: 6/5/14 TIME: 8:50-9:10

CALIBRATION: 94.0 dB.

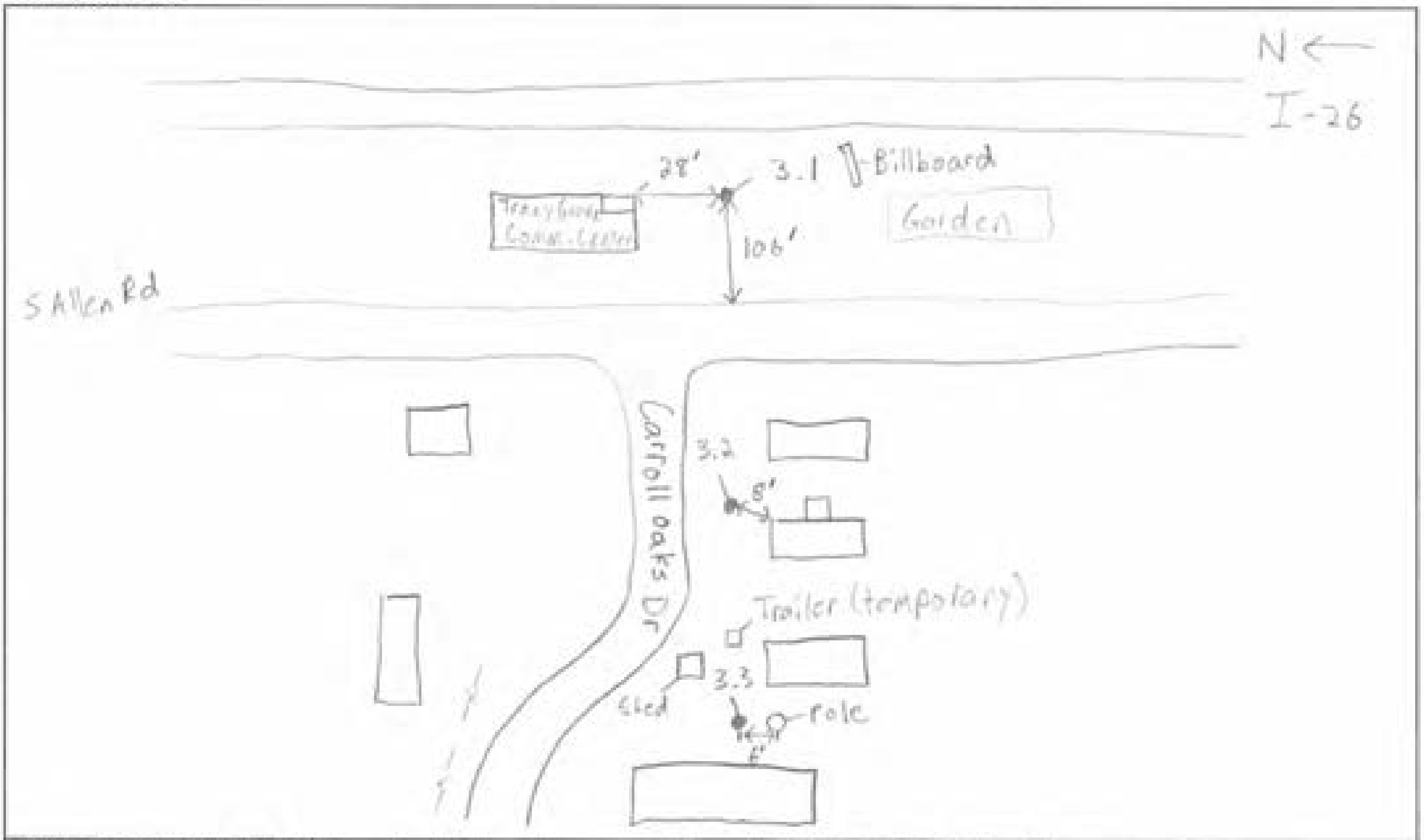
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)	S Allen Rd	I-26
AUTOS	21 NB EB 35 SB WB	420 NB 346 SB
MED TRKS	0 EB 0 WB	15 NB 23 SB
HVY TRKS	2 EB 0 WB	68 NB 68 SB
BUS	0 EB 0 WB	0 NB 0 SB
MOTORCYCLE	0 EB 0 WB	1 NB 0 SB
SPEED	45	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA | Duration 20 min | Leq (dB) 62.0, 56.7, 52.0

WEATHER DATA WIND SPEED (MPH) 3 DIR. E TEMP. 72° HUMIDITY 81% CLOUD COVER Scattered Clouds

BACKGROUND NOISE Rooster crowing, Birds

MAJOR SOURCES

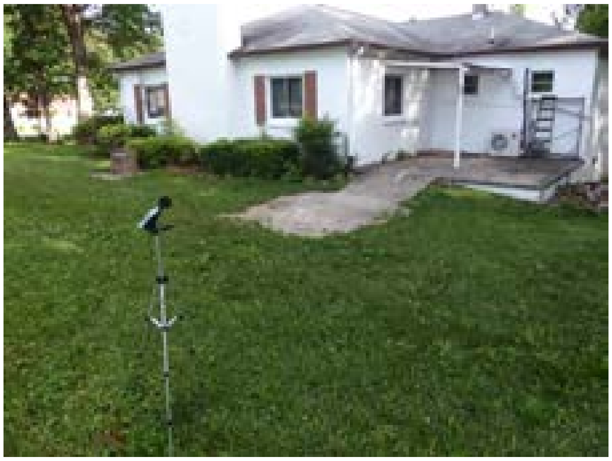
UNUSUAL EVENTS Heavy truck in garden (8')-3.1

OTHER NOTES

Pictures: 3.1, 3.2, 3.3

Noise Monitoring Site 3

Carroll Oaks Dr – Single Family Residential



Noise Meter 3.1 Looking North

Noise Meter 3.2 Looking Southeast

Noise Meter 3.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 4.1-3 DATE: 6/4/14 TIME: 16:30-16:50

CALIBRATION: 94.0 dB.

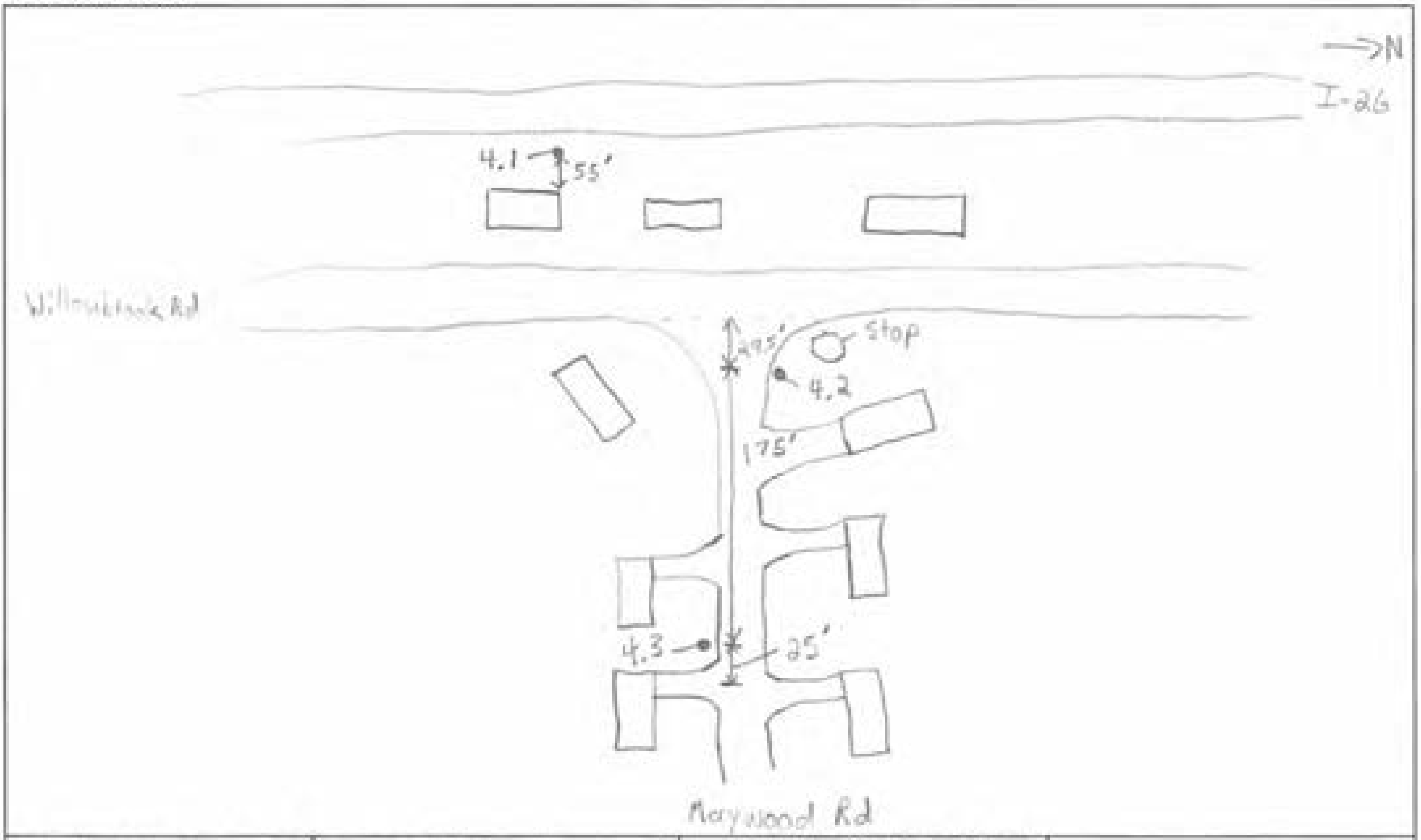
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)	Willowbrook Rd	I-26
AUTOS	5 ~~EB~~ NE 4 ~~WB~~ SB	508 NB 514 SB
MED TRKS	0 EB 0 WB	6 NB 19 SB
HVY TRKS	0 EB 0 WB	71 NB 61 SB
BUS	0 EB 0 WB	0 NB 0 SB
MOTORCYCLE	0 EB 0 WB	2 NB 1 SB
SPEED	25	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 63.9, 55.1, 51.9	

WEATHER DATA WIND SPEED (MPH) 1 DIR. NW TEMP. 82° HUMIDITY 66% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Car (2', 11', 13') Motorized Bicycles (12')

OTHER NOTES

Noise Monitoring Site 4

Maywood Rd – Single Family Residential

Noise Meter 4.1 Looking Southeast

Noise Meter 4.2 Looking West

Noise Meter 4.3 Looking West

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 5.1-3 DATE: 6/4/14 TIME: 15:35-15:55

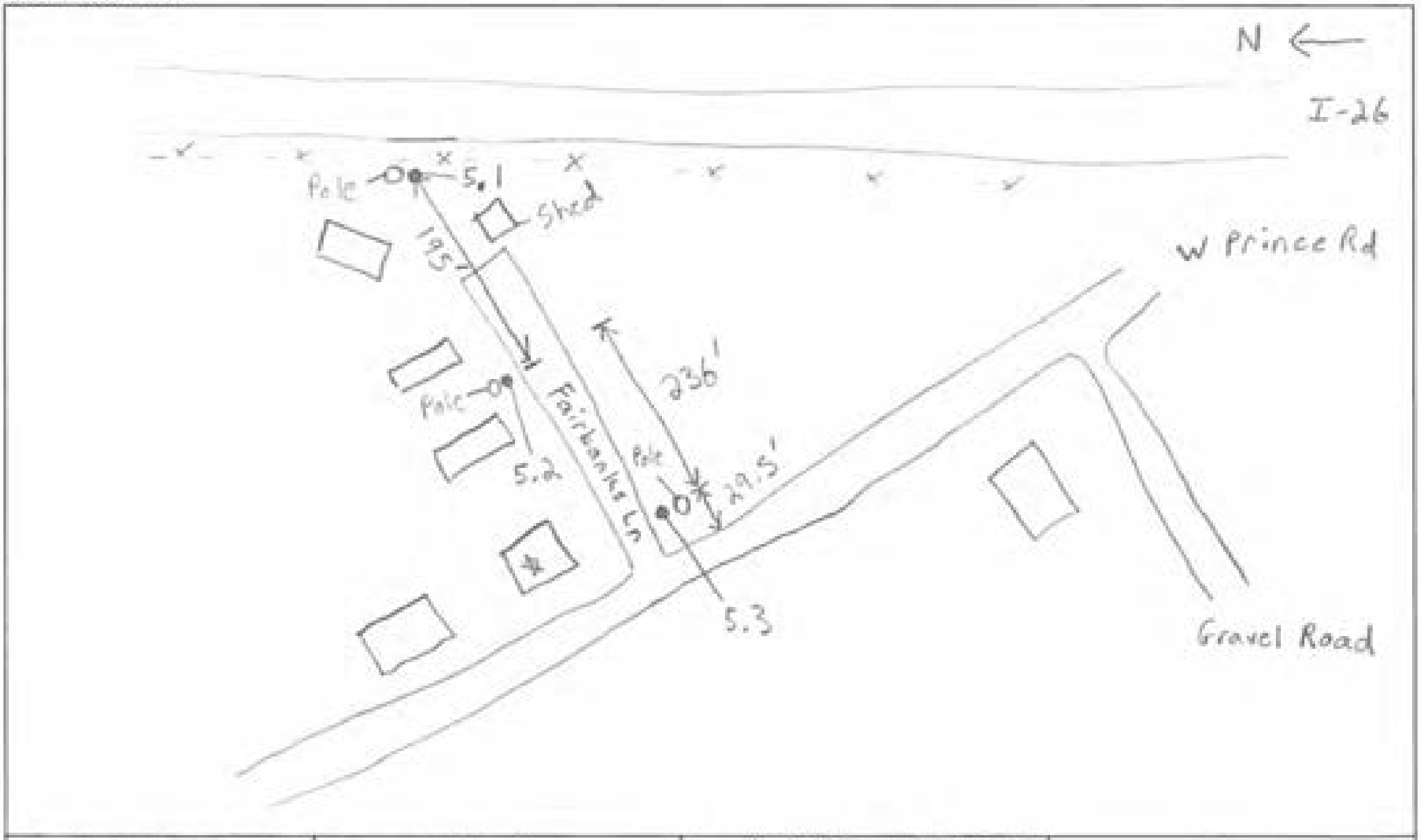
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	504 NB 495 SB
MED TRKS	___EB ___WB	11 NB 19 SB
HVY TRKS	___EB ___WB	74 NB 60 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	2 NB 4 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site D1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 65.0, 60.2, 55.2	

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 82° HUMIDITY 65% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Car(4', 16', 17', 20') Dog (17') Bird (19') - 5.3 Bus (12', 13')

OTHER NOTES

Noise Monitoring Site 5

Fairbanks Ln – Single Family Residential

Noise Meter 5.1 Looking Northeast

Noise Meter 5.2 Looking West

Noise Meter 5.3 Looking Northeast

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 6.1-3 DATE: 6/4/14 TIME: 17:10-17:30

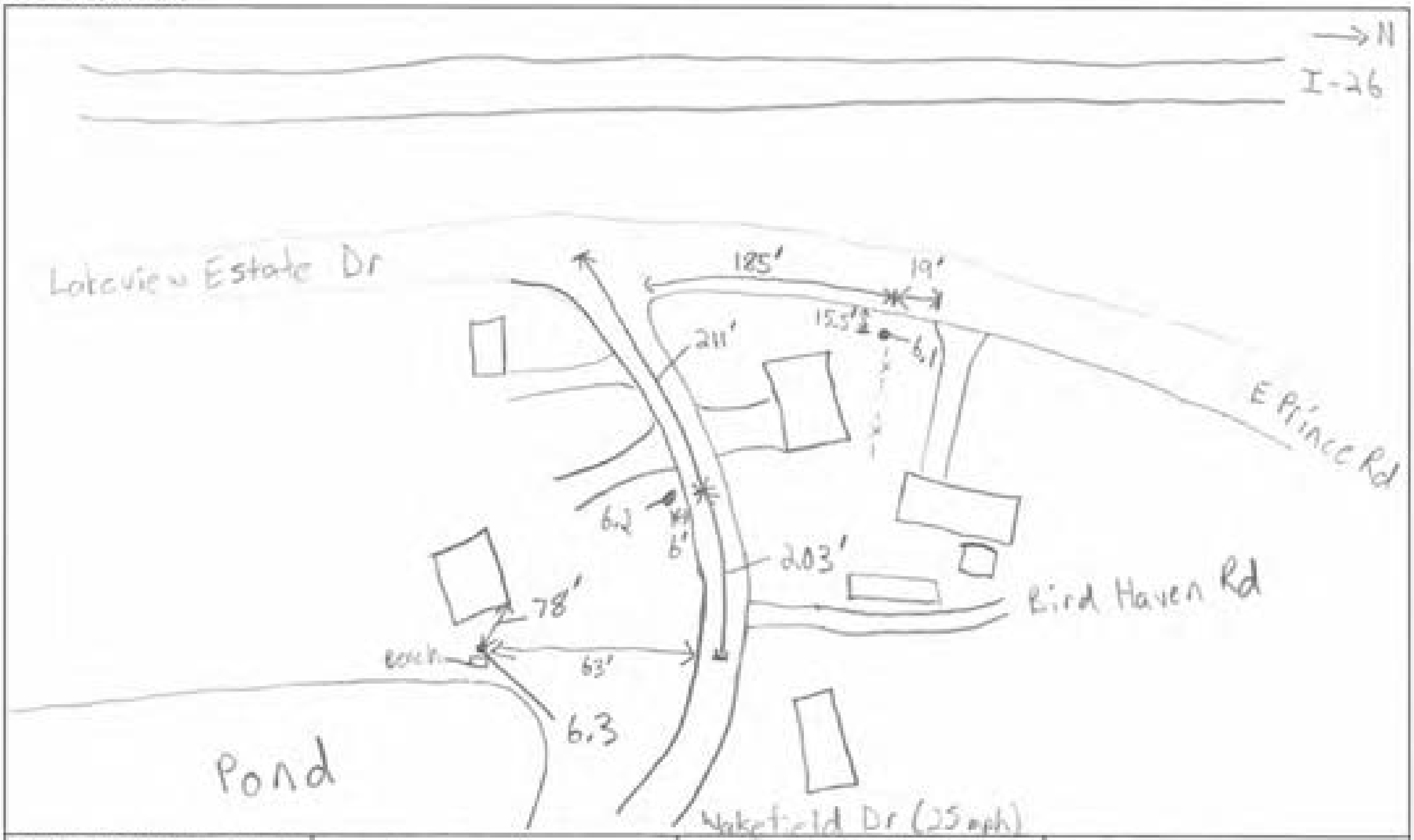
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

	TRAFFIC DATA			
Prince	ROAD (Name/Dir)	Lakeview Estate	Wakefield	I-26
5	AUTOS	26 EB	21 WB	507 NB 547 SB
0	MED TRKS	1 EB	1 WB	7 NB 11 SB
1	HVY TRKS	1 EB	0 WB	91 NB 61 SB
0	BUS	0 EB	0 WB	1 NB 0 SB
0	MOTORCYCLE	2 EB	2 WB	2 NB 7 SB
	SPEED		25	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 69.4, 61.6, 58.2

WEATHER DATA WIND SPEED (MPH) 5 DIR. S/SW TEMP. 82° HUMIDITY 72% CLOUD COVER Scattered Cloud-

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES

Note - Prince traffic = Lakeview Estate - Wakefield

Noise Monitoring Site 6

Wakefield Dr – Single Family Residential

Noise Meter 6.1 Looking Northeast

Noise Meter 6.2 Looking Southwest

Noise Meter 6.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 7.1-7.3 DATE: 6/4/14 TIME: 14:00-14:20

CALIBRATION: 94.0 dB.

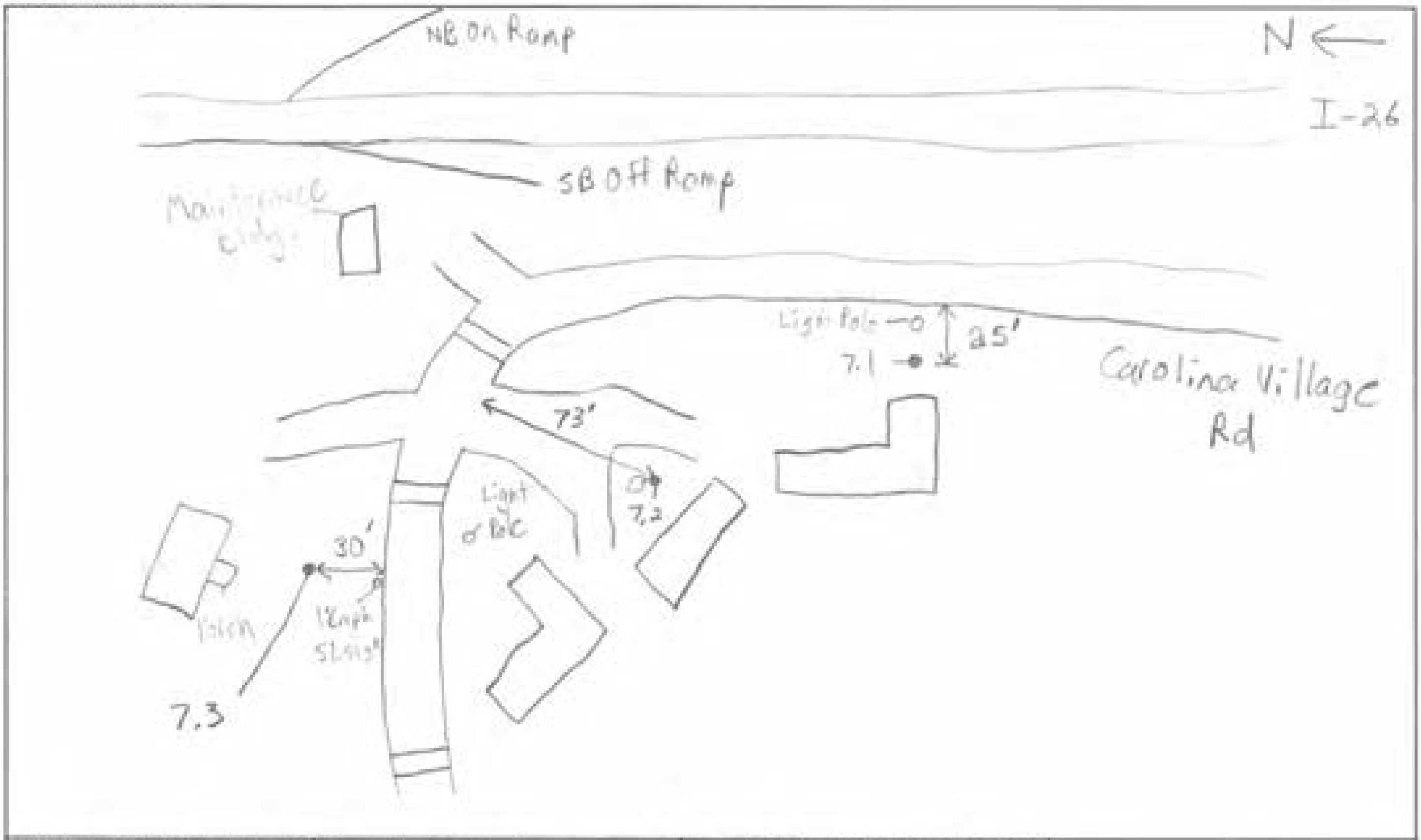
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

NB RAMP	TRAFFIC DATA			SB RAMP
	ROAD (Name/Dir)		I-25	
82	AUTOS	29 EB 22 WB	439 NB 372 SB	64
2	MED TRKS	0 EB 0 WB	16 NB 22 SB	2
5	HVY TRKS	0 EB 0 WB	85 NB 54 SB	0
3	BUS	0 EB 0 WB	0 NB 0 SB	0
3	MOTORCYCLE	0 EB 0 WB	5 NB 0 SB	0
	SPEED	20	65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 62.8, 56.3, 54.1	

WEATHER DATA WIND SPEED (MPH) 1 DIR. V TEMP. 84° HUMIDITY 60% CLOUD COVER Mostly Cloudy

BACKGROUND NOISE AC Unit (7.3)

MAJOR SOURCES

UNUSUAL EVENTS Talking (18-20') - 7.3

OTHER NOTES

Noise Monitoring Site 7

Carolina Village Rd – Multi-Family Residential

Noise Meter 7.1 Looking Southwest

Noise Meter 7.2 Looking North

Noise Meter 7.3 Looking Northwest

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 8.1 DATE: 6/4/14 TIME: 11:25-11:45

CALIBRATION: 94.0 dB.

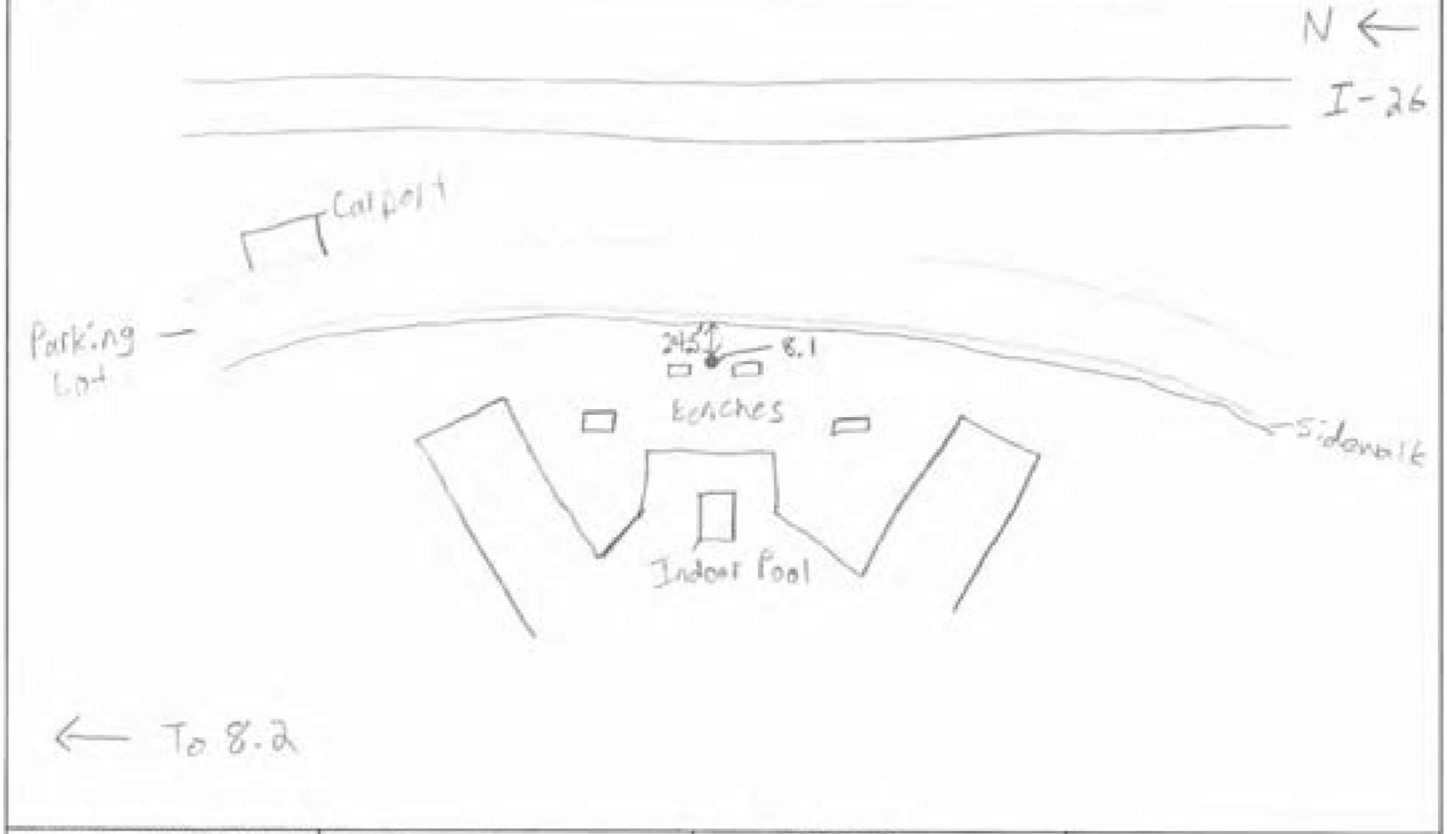
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	527 NB 420 SB
MED TRKS	___EB ___WB	11 NB 22 SB
HVY TRKS	___EB ___WB	133 NB 57 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	1 NB 4 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	
SLM MANUFACTURER	Rion
SLM MODEL	NL-32
SLM	01161900
PREAMPLIFIER – Type ~~1206~~ NH-21	21933
MICROPHONE – Type ~~1225~~ UC-53A	311130
CALIBRATOR – Type ~~1251~~ NC-74	34536122

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq 59.9 dB

WEATHER DATA WIND SPEED (MPH) 2 DIR. SE TEMP. 79° HUMIDITY 69% CLOUD COVER Clear

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Loud talking (6'), Loud Car (10')

OTHER NOTES

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 8.2 DATE: 6/4/14 TIME: 11:25-11:45

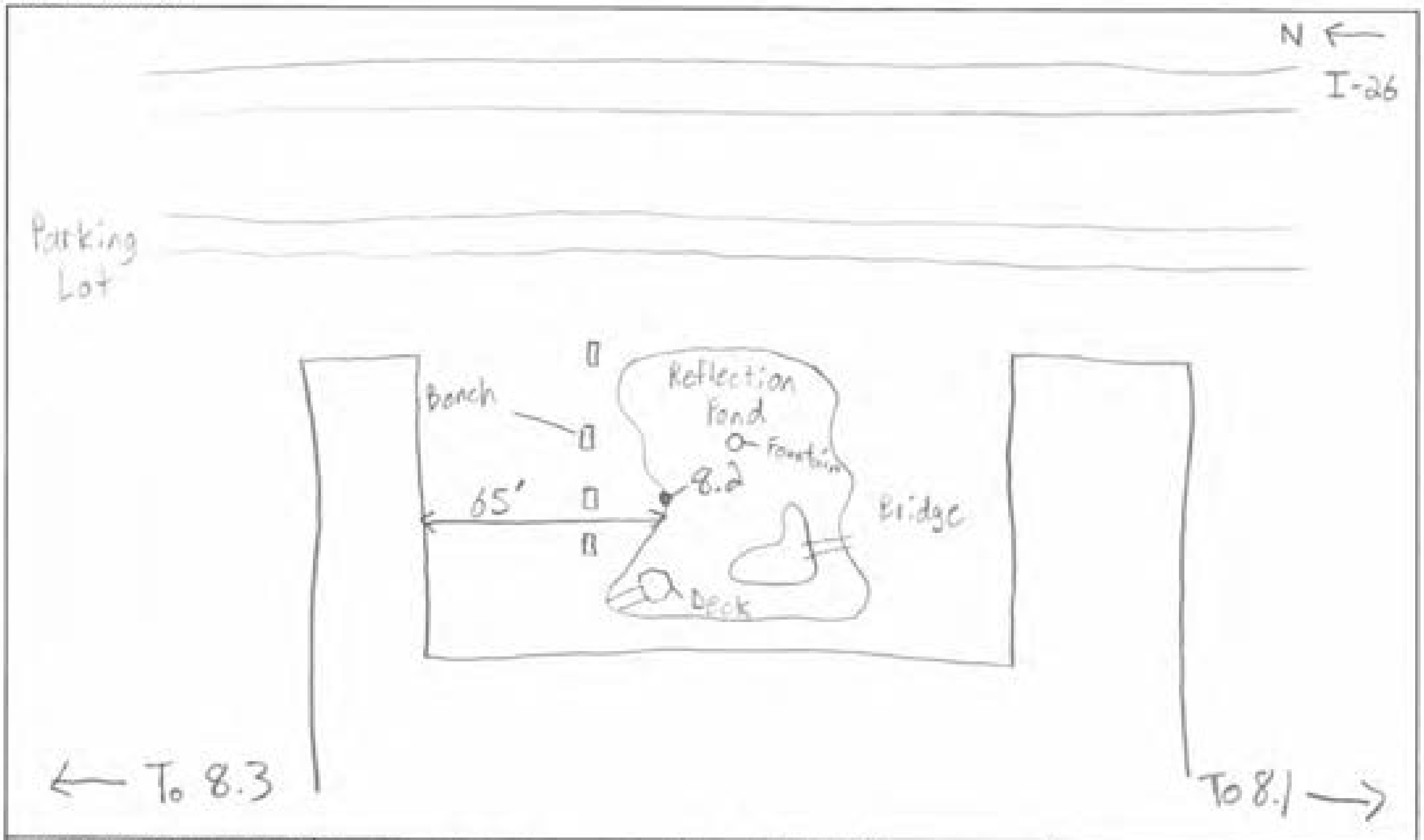
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	527 NB 420 SB
MED TRKS	___EB ___WB	11 NB 22 SB
HVY TRKS	___EB ___WB	133 NB 57 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	1 NB 4 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	
SLM MANUFACTURER	Rion
SLM MODEL	NL-32
SLM	00282514
PREAMPLIFIER – Type ~~1206~~ NH-21	26713
MICROPHONE – Type ~~1225~~ UC-53A	313875
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq 61.1 dB	

WEATHER DATA WIND SPEED (MPH) 2 DIR. SE TEMP. 79° HUMIDITY 69% CLOUD COVER Clear

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Fountain On and Off (10')

OTHER NOTES

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 8.3 DATE: 6/4/14 TIME: 11:25 - 11:45

CALIBRATION: 94.0 dB.

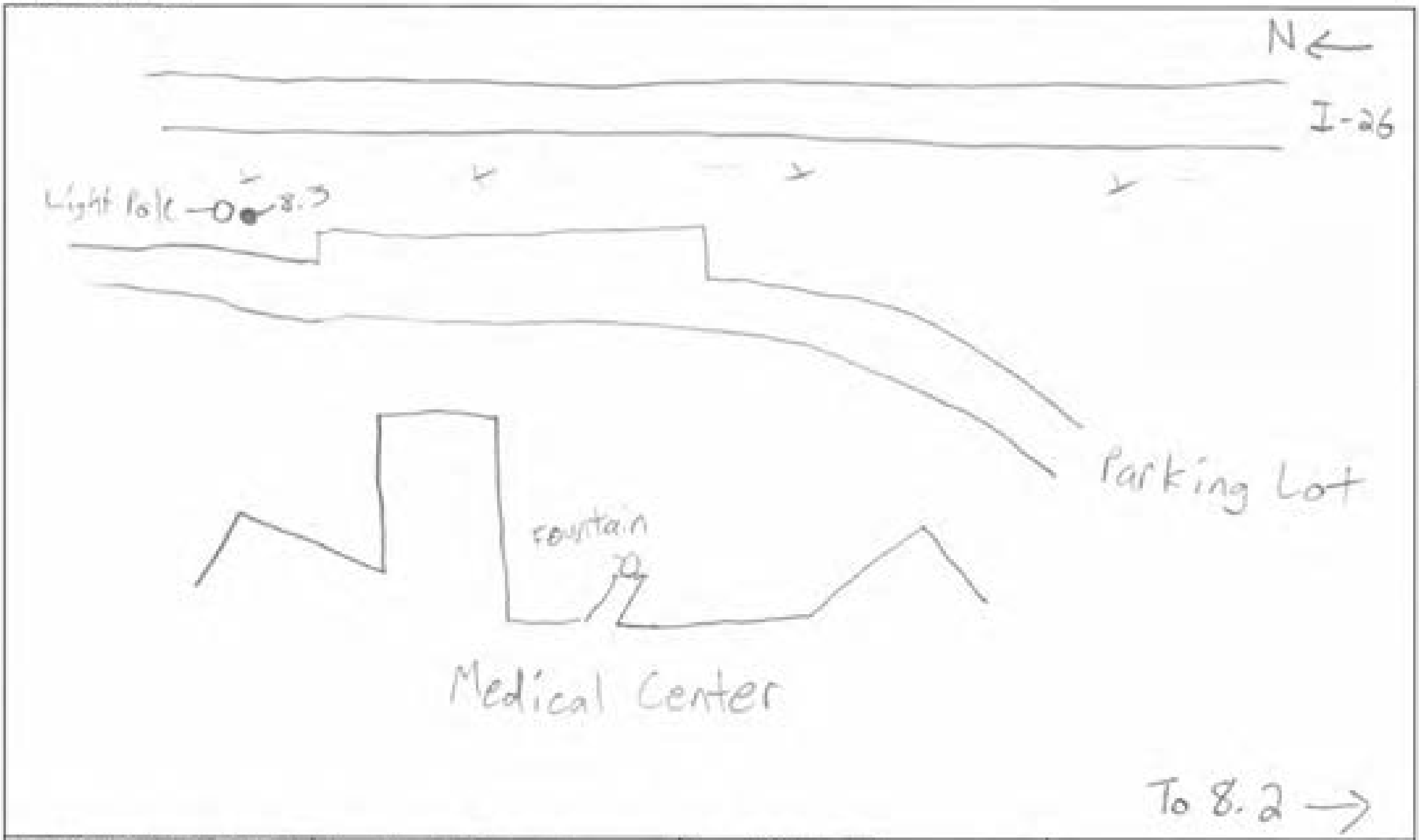
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		
AUTOS	___EB ___WB	___NB ___SB
MED TRKS	___EB ___WB	___NB ___SB
HVY TRKS	___EB ___WB	___NB ___SB
BUS	___EB ___WB	___NB ___SB
MOTORCYCLE	___EB ___WB	___NB ___SB
SPEED		

EQUIPMENT	
INSTRUMENT	
SLM MANUFACTURER	Rion
SLM MODEL	NL-32
SLM	01161899
PREAMPLIFIER – Type ~~1206~~ NH-21	21932
MICROPHONE – Type ~~1225~~ UC-53A	311127
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq 69.1 dB	

WEATHER DATA WIND SPEED (MPH) 2 DIR. SE TEMP. 79° HUMIDITY 69% CLOUD COVER Clear

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES

Noise Monitoring Site 8

Carolina Village Rd – Multi-Family Residential

Noise Meter 8.1 Looking West

Noise Meter 8.2 Looking Southwest

Noise Meter 8.3 Looking Southeast

HNTB

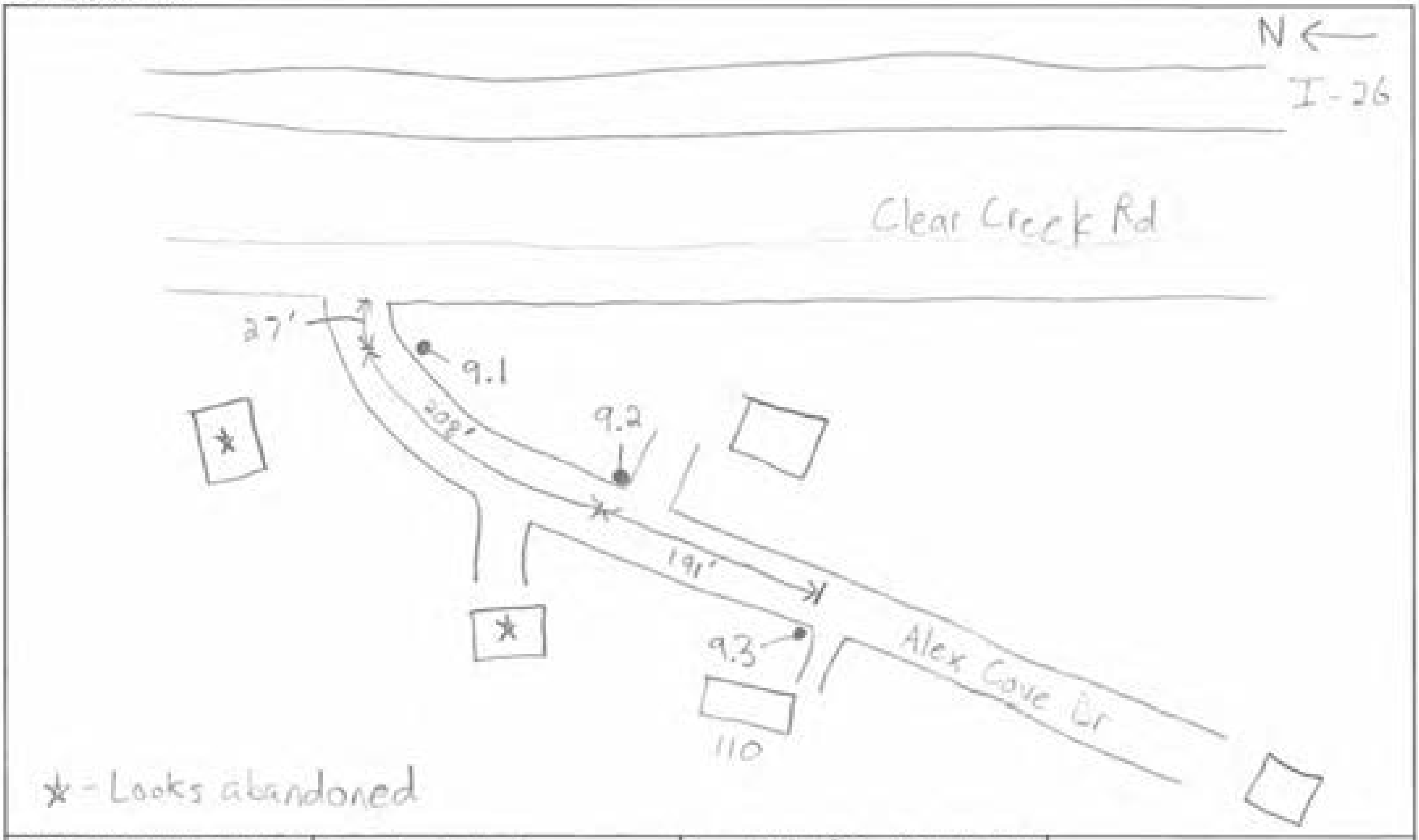
NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan
SITE: 9.1-9.3 DATE: 6/4/14 TIME: 9:50-10:10
CALIBRATION: 94.0 dB.
RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	420 NB 429 SB
MED TRKS	___EB ___WB	20 NB 11 SB
HVY TRKS	___EB ___WB	70 NB 87 SB
BUS	___EB ___WB	0 NB 2 SB
MOTORCYCLE	___EB ___WB	6 NB 1 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 69.2, 62.1, 59.2	

WEATHER DATA WIND SPEED (MPH) 1 DIR. SW TEMP. 72° HUMIDITY 86% CLOUD COVER Clear
BACKGROUND NOISE
MAJOR SOURCES
UNUSUAL EVENTS
OTHER NOTES

Pictures: 9.1, 9.2, 9.3

Noise Monitoring Site 9

Alex Cove Dr – Single Family Residential

Noise Meter 9.1 Looking North

Noise Meter 9.2 Looking Southeast

Noise Meter 9.3 Looking Southwest

HNTB

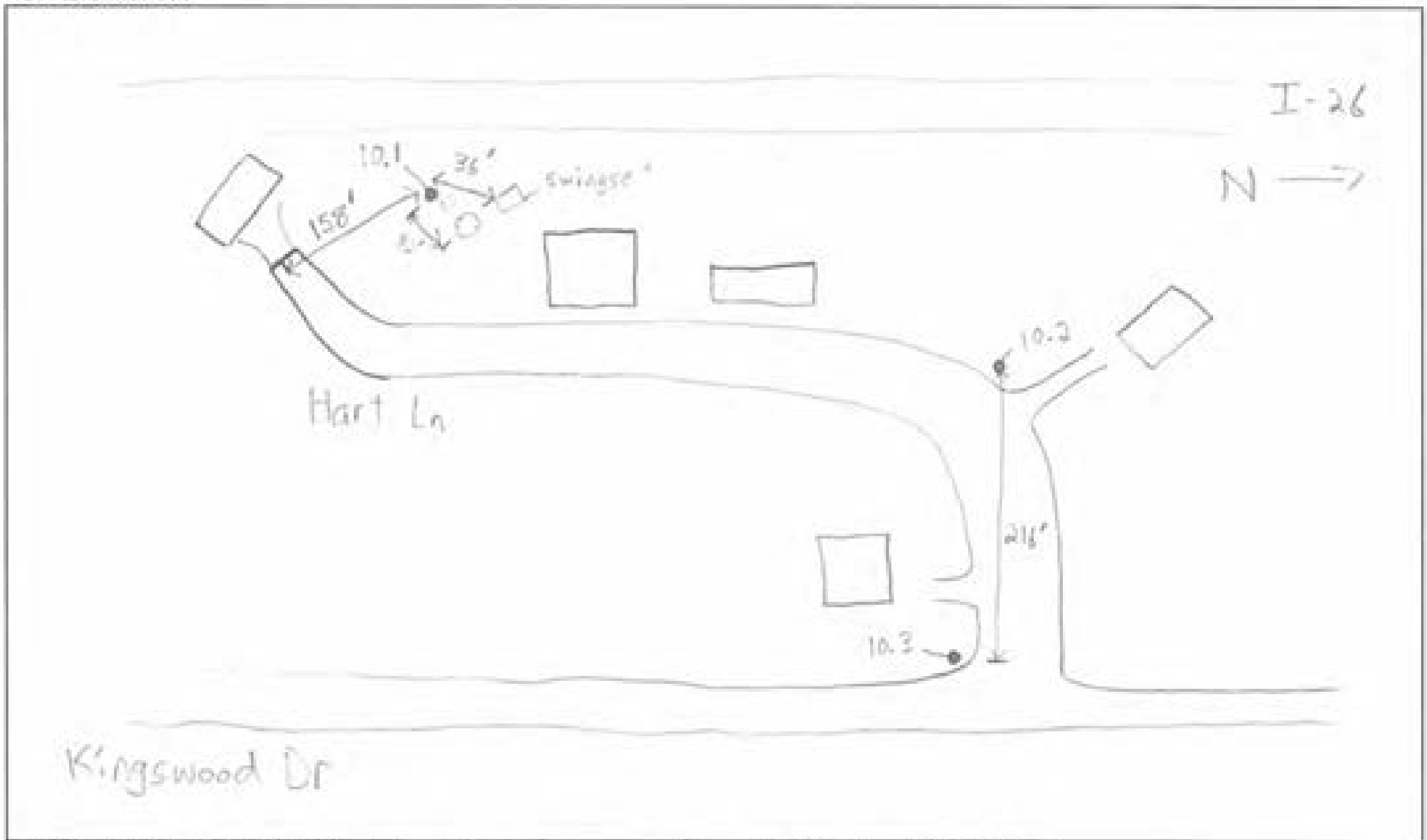
NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan
SITE: 10.1-3 DATE: 6/4/14 TIME: 9:00-9:20
CALIBRATION: 94.0 dB.
RESPONSE: FAST / [✓ SLOW]
WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	435 NB 383 SB
MED TRKS	___EB ___WB	22 NB 18 SB
HVY TRKS	___EB ___WB	72 NB 75 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	2 NB 2 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 64.6, 63.1, 59.1

WEATHER DATA WIND SPEED (MPH) 1 DIR. SW TEMP. 66° HUMIDITY 97% CLOUD COVER Clear
BACKGROUND NOISE
MAJOR SOURCES
UNUSUAL EVENTS Dog (2') - 10.3, 2 Cars (15') - 10.2 & 10.3
OTHER NOTES

Pictures: 10.3, 10.2, 10.1

Noise Monitoring Site 10

Hart Ln – Single Family Residential

Noise Meter 10.1 Looking Southwest

Noise Meter 10.2 Looking West

Noise Meter 10.3 Looking Southwest

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 11.1-3 DATE: 6/13/14 TIME: 17:30-17:50

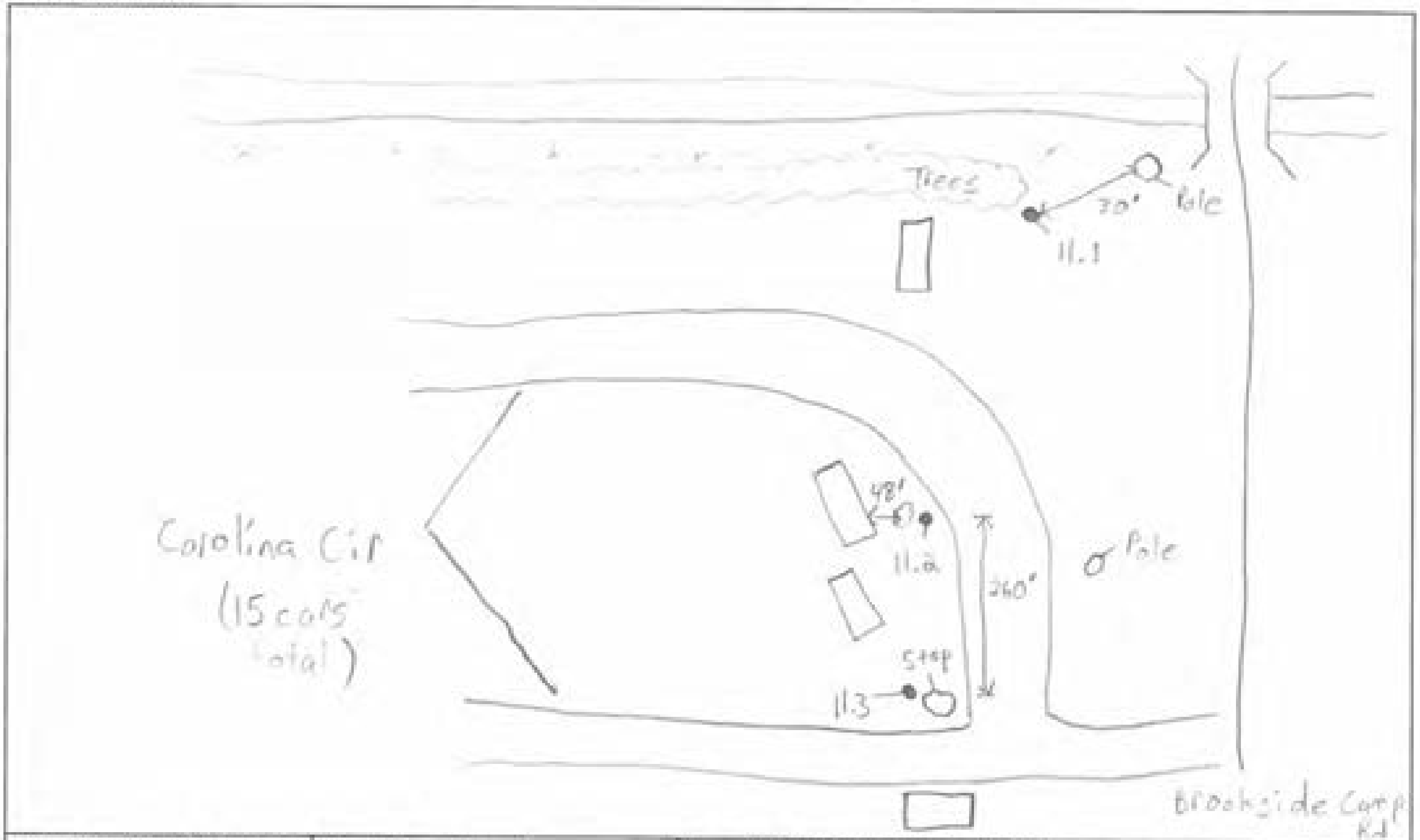
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)	Brookside Camp Rd	I-26
AUTOS	55 EB 53 WB	653 NB 545 SB
MED TRKS	EB WB	11 NB 12 SB
HVY TRKS	EB WB	69 NB 63 SB
BUS	EB WB	0 NB 1 SB
MOTORCYCLE	EB WB	0 NB 5 SB
SPEED	45	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 65.9, 59.9, 60.3

WEATHER DATA WIND SPEED (MPH) 4 DIR. E TEMP. 81° HUMIDITY 61% CLOUD COVER Partly Cloudy

BACKGROUND NOISE Roosters Crowing (11.3)

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES

Noise Monitoring Site 11

Carolina Cir – Single Family Residential

Noise Meter 11.1 Looking Northeast

Noise Meter 11.2 Looking Southwest

Noise Meter 11.3 Looking Northeast

HNTB

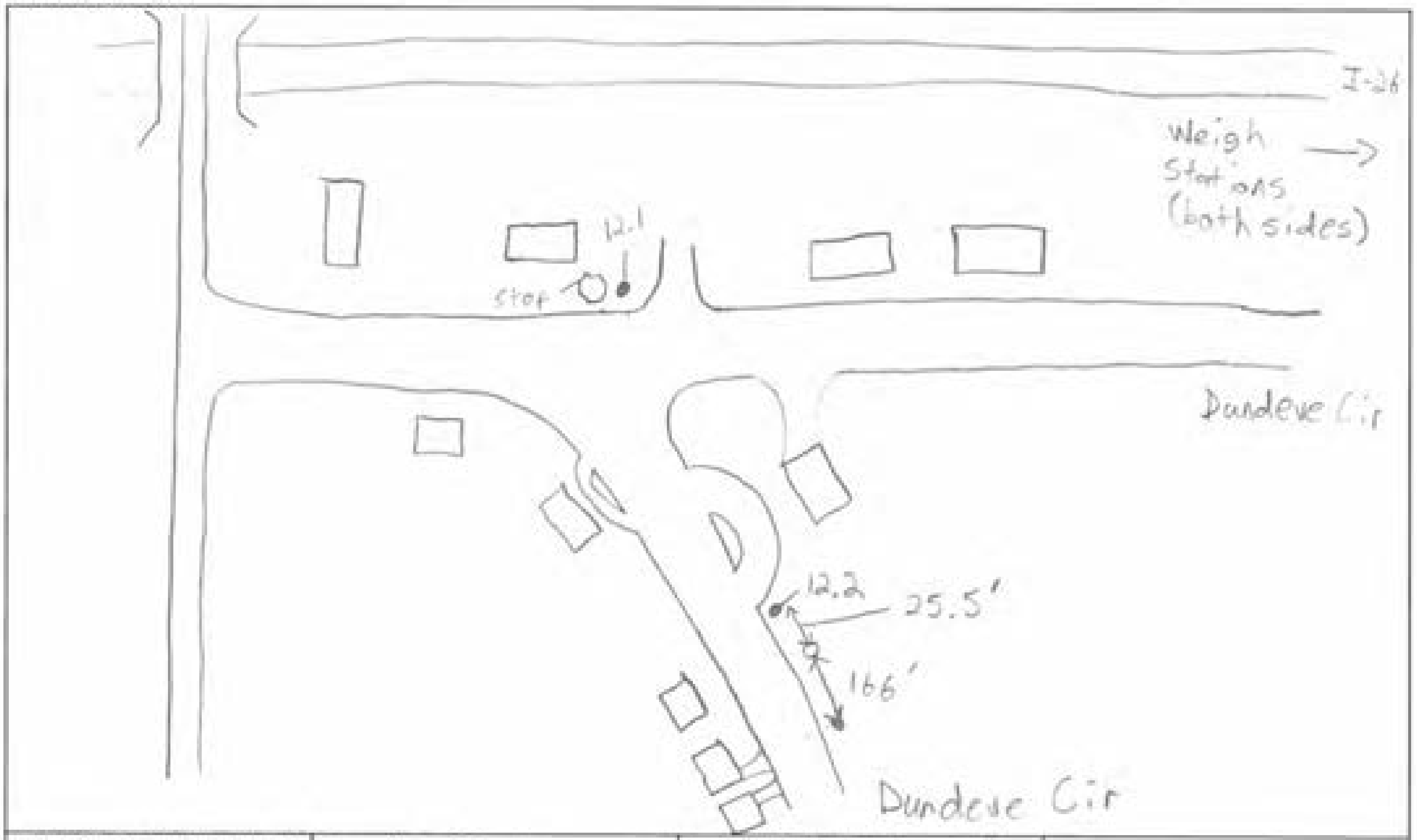
NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan
SITE: 12.1-3 DATE: 6/3/14 TIME: 16:45-17:05
CALIBRATION: 94.0 dB.
RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	531 NB 675 SB
MED TRKS	___EB ___WB	16 NB 15 SB
HVY TRKS	___EB ___WB	82 NB 56 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	4 NB 1 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 62.4, 58.5, 54.0	

WEATHER DATA WIND SPEED (MPH) 3 DIR. S/SE TEMP. 77° HUMIDITY 70% CLOUD COVER Partly Cloudy
BACKGROUND NOISE
MAJOR SOURCES
UNUSUAL EVENTS
OTHER NOTES

Noise Monitoring Site 12

Dundeve Cir – Single Family Residential

Noise Meter 12.1 Looking Southwest

Noise Meter 12.2 Looking West

Noise Meter 12.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 13.1-3 DATE: 6/3/14 TIME: 16:00-16:20

CALIBRATION: 94.0 dB.

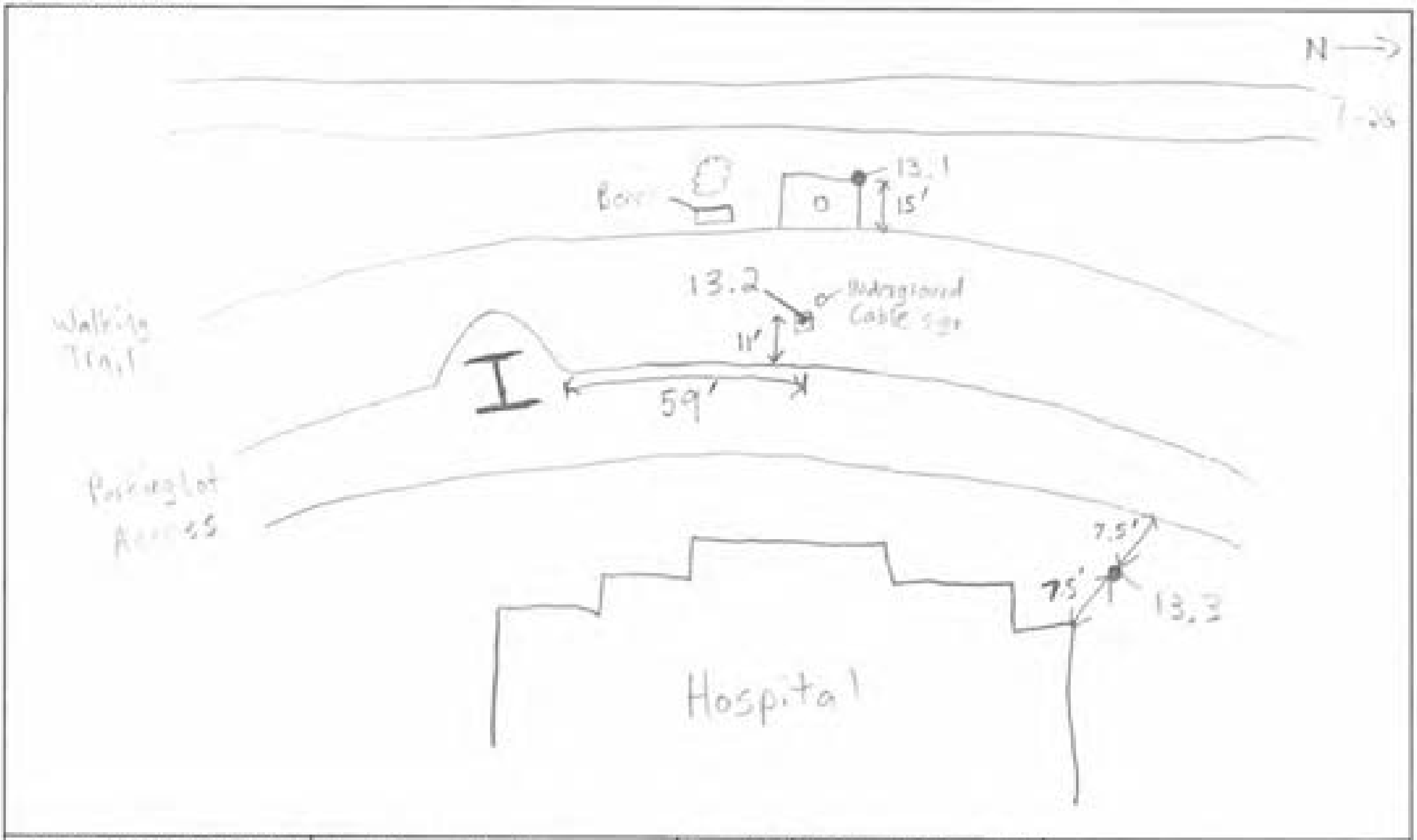
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		
AUTOS	___EB ___WB	513 NB 640 SB
MED TRKS	___EB ___WB	12 NB 15 SB
HVY TRKS	___EB ___WB	79 NB 60 SB
BUS	___EB ___WB	1 NB 0 SB
MOTORCYCLE	___EB ___WB	2 NB 0 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 67.4, 69.2, 64.1	

WEATHER DATA WIND SPEED (MPH) 4 DIR. E TEMP. 76° HUMIDITY 71% CLOUD COVER Mostly Cloudy

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES

Noise Monitoring Site 13

Park Ridge Health – Commercial (Medical)

Noise Meter 13.1 Looking East

Noise Meter 13.2 Looking West

Noise Meter 13.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 14.1-3 DATE: 6/5/14 TIME: 14:30-14:50

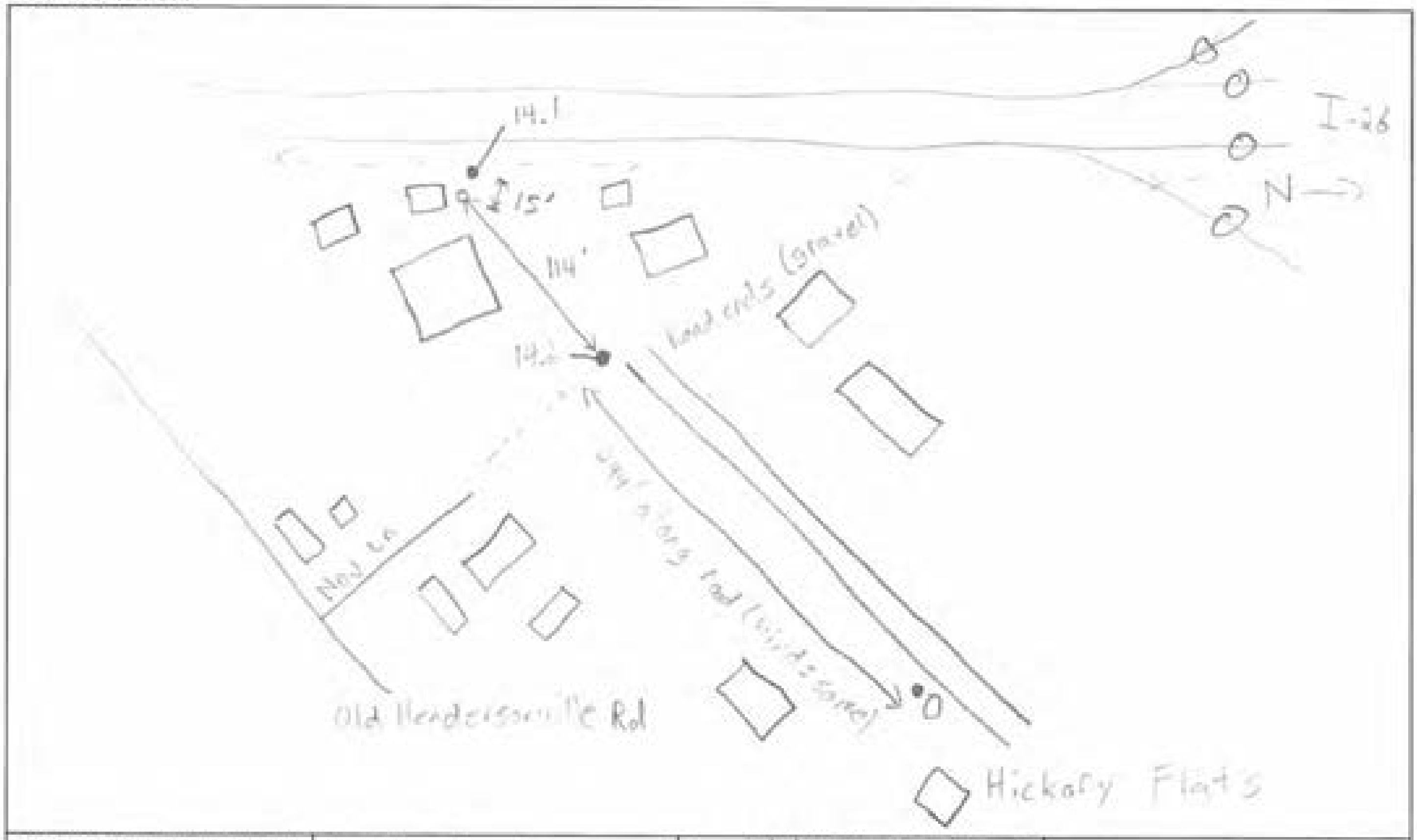
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

NB RAMP	TRAFFIC DATA			SB RAMP
	ROAD (Name/Dir)		I-26	
118	AUTOS	___ EB ___ WB	349 NB 410 SB	117
6	MED TRKS	___ EB ___ WB	7 NB 12 SB	2
5	HVY TRKS	___ EB ___ WB	70 NB 67 SB	9
0	BUS	___ EB ___ WB	3 NB 0 SB	0
0	MOTORCYCLE	___ EB ___ WB	0 NB 1 SB	2
	SPEED		65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 62.6, 60.3, 55.8	

WEATHER DATA WIND SPEED (MPH) 5 DIR. E TEMP. 76° HUMIDITY 70% CLOUD COVER Mostly Cloudy

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Dogs (1')

OTHER NOTES

Noise Monitoring Site 14

Hickory Flats Dr – Single Family Residential

Noise Meter 14.1 Looking Southeast

Noise Meter 14.2 Looking South

Noise Meter 14.3 Looking South

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/I-4700 JOB #: 41470 BY: T. J.

SITE: M15.1-3 DATE: 6-2-2014 TIME: 11:00-11:20

CALIBRATION: 94.0 dB.

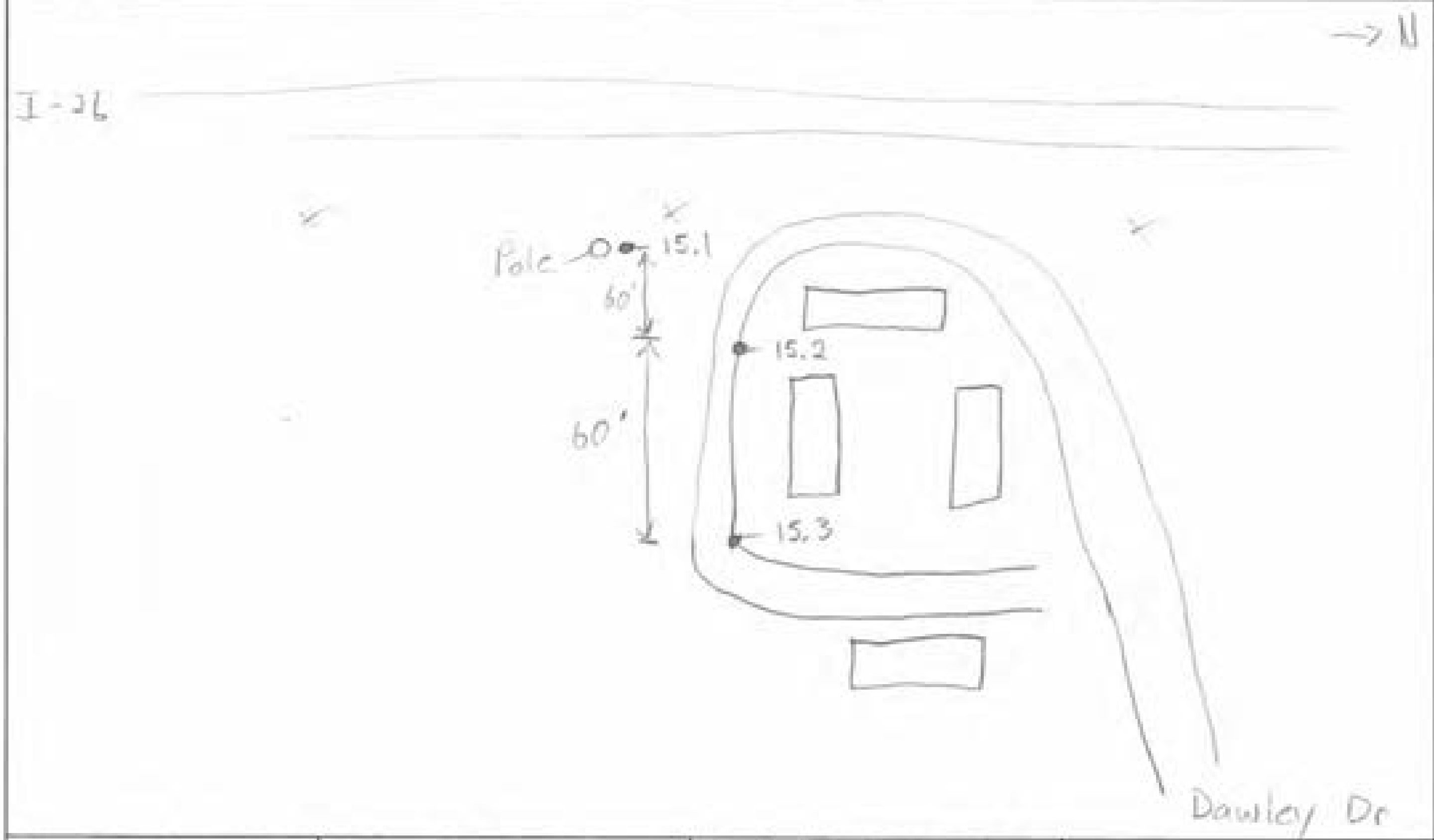
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	463 NB 489 SB
MED TRKS	___EB ___WB	27 NB 12 SB
HVY TRKS	___EB ___WB	60 NB 75 SB
BUS	___EB ___WB	0 NB 1 SB
MOTORCYCLE	___EB ___WB	2 NB 3 SB
SPEED		

EQUIPMENT	
INSTRUMENT	See Site 0-1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min.	Leq (dB) 61.6, 58.1, 56.0	

WEATHER DATA WIND SPEED (MPH) calm DIR. TEMP. 70° HUMIDITY 41% CLOUD COVER Scattered clouds

BACKGROUND NOISE Birds

MAJOR SOURCES

UNUSUAL EVENTS Car door shutting (16') Dog (17') Loud bird (20')

OTHER NOTES

Pictures: 15.1, 15.2, 15.3

Noise Monitoring Site 15

Dawley Dr – Single Family Residential

Noise Meter 15.1 Looking Southwest

Noise Meter 15.2 Looking West

Noise Meter 15.3 Looking Southwest

HNTB NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/I-4700 JOB #: 41470 BY: T. J.

SITE: M16.1 - 16.3 DATE: 6-2-2014 TIME: 9:40 - 10:00

CALIBRATION: 94.0 dB.

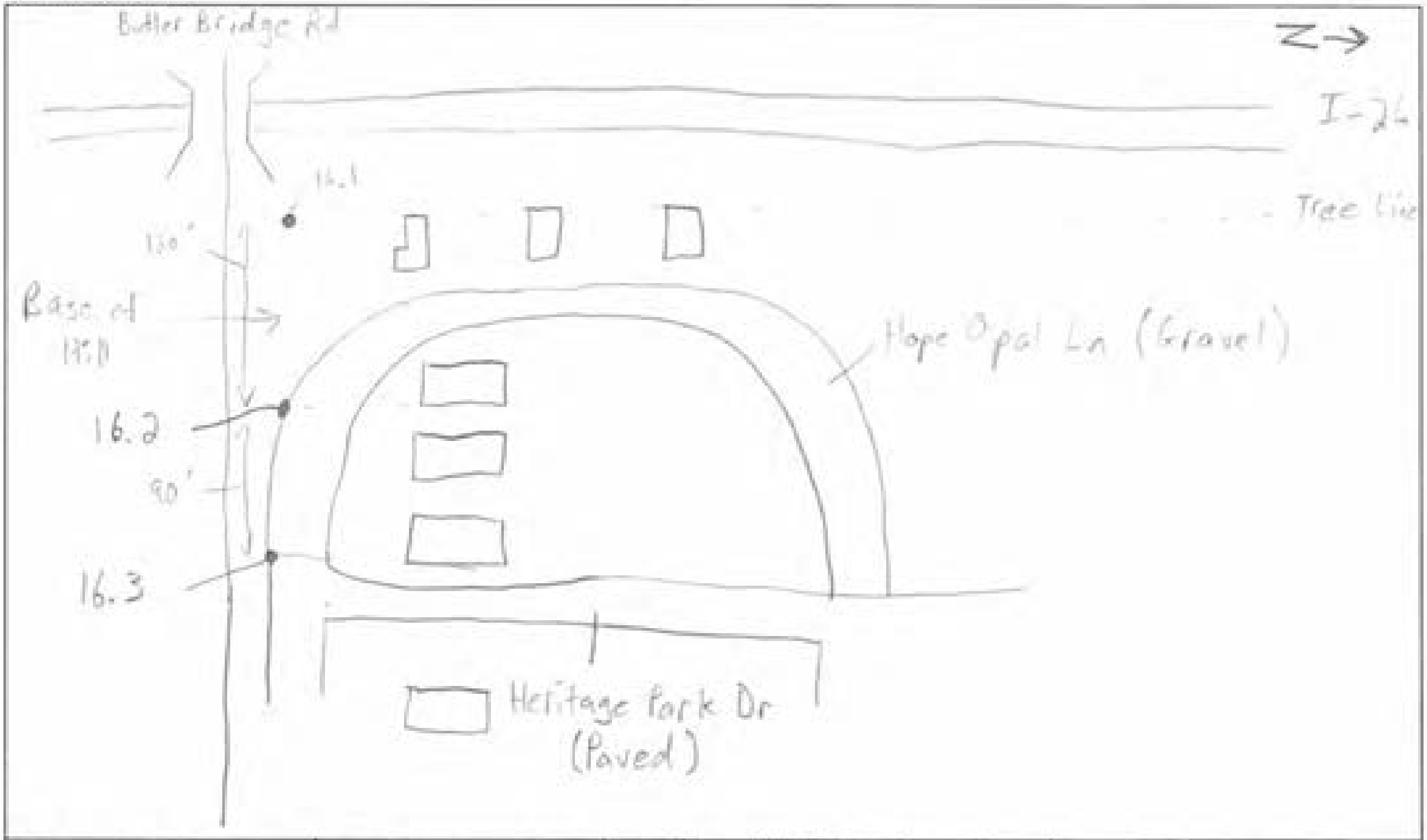
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)	Butler Bridge Rd	I-26
AUTOS	69 EB 57 WB	369 NB 388 SB
MED TRKS	1 EB 2 WB	6 NB 7 SB
HVY TRKS	2 EB 2 WB	83 NB 52 SB
BUS	0 EB 0 WB	2 NB 2 SB
MOTORCYCLE	2 EB 0 WB	0 NB 5 SB
SPEED	35mph	65mph

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA | Duration 20 minutes | Leq (dB) 69.3, 63.3, 62.3

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 60° HUMIDITY 55% CLOUD COVER Scattered clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Airplane flyover (16')

OTHER NOTES

Picture order: 16.3, 16.2, 16.1

Noise Monitoring Site 16

Hope Opal Ln – Single Family Residential

Noise Meter 16.1 Looking West

Noise Meter 16.2 Looking West

Noise Meter 16.3 Looking West

HNTB

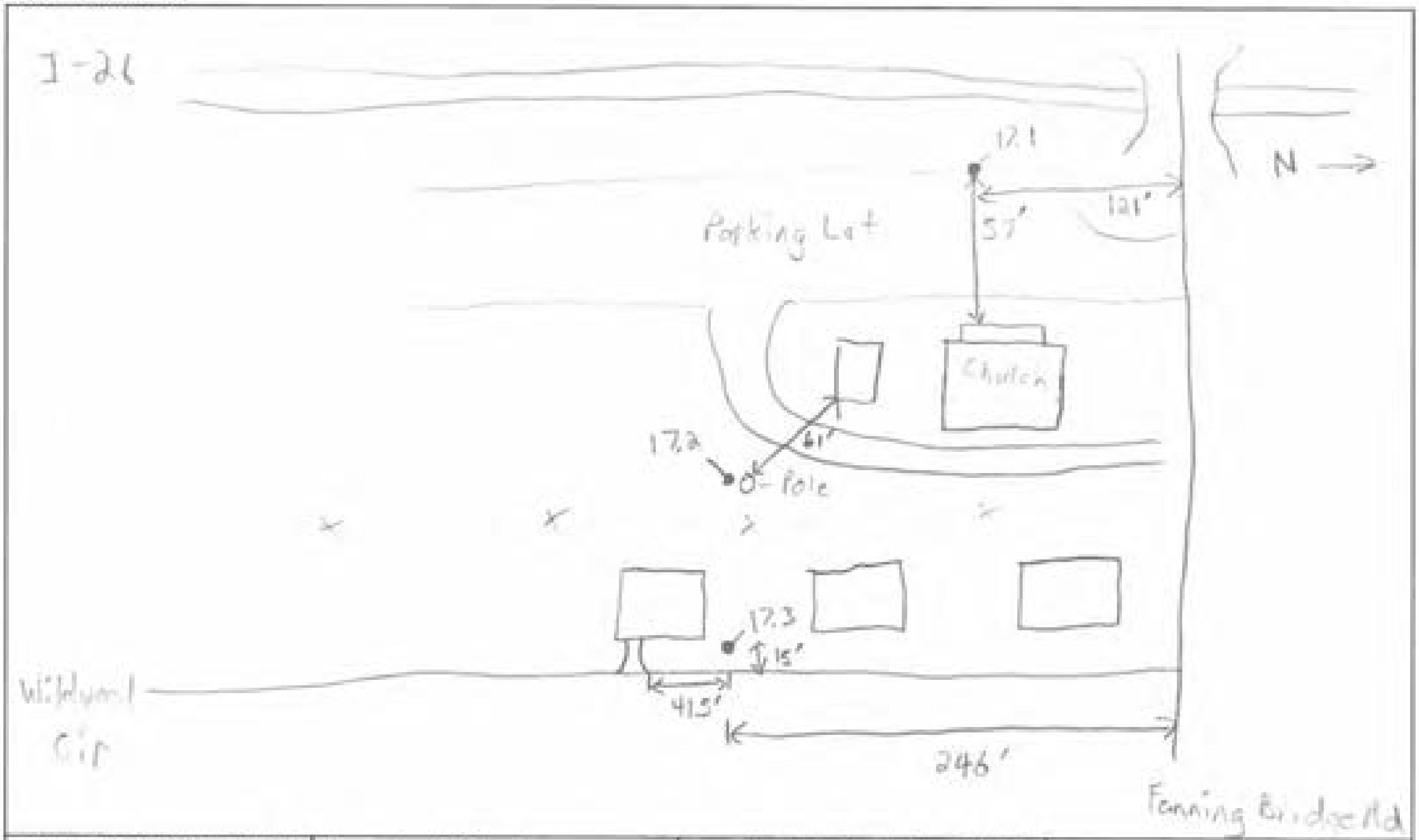
NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan
SITE: 17.1 - 17.3 DATE: 6/2/14 TIME: 14:35 - 14:55
CALIBRATION: 94.0 dB.
RESPONSE: FAST / [✓ SLOW]
WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)	Fanning Bridge Rd	I-26
AUTOS	59 EB 53 WB	520 NB 561 SB
MED TRKS	0 EB 1 WB	19 NB 12 SB
HVY TRKS	0 EB 0 WB	84 NB 75 SB
BUS	0 EB 0 WB	0 NB 0 SB
MOTORCYCLE	0 EB 0 WB	2 NB 3 SB
SPEED	35	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 68.6, 61.8, 54.6

WEATHER DATA WIND SPEED (MPH) 1 DIR. SE TEMP. 75° HUMIDITY 68% CLOUD COVER Scattered Clouds
BACKGROUND NOISE
MAJOR SOURCES
UNUSUAL EVENTS
OTHER NOTES

Picture order: 17.1, 17.2, 17.3

Noise Monitoring Site 17

Wildwood Cir – Single Family Residential

Noise Meter 17.1 Looking Northwest

Noise Meter 17.2 Looking Northwest

Noise Meter 17.3 Looking West

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: M 18.1-18.3 DATE: 6/2/14 TIME: 13:30-13:50

CALIBRATION: 94.0 dB.

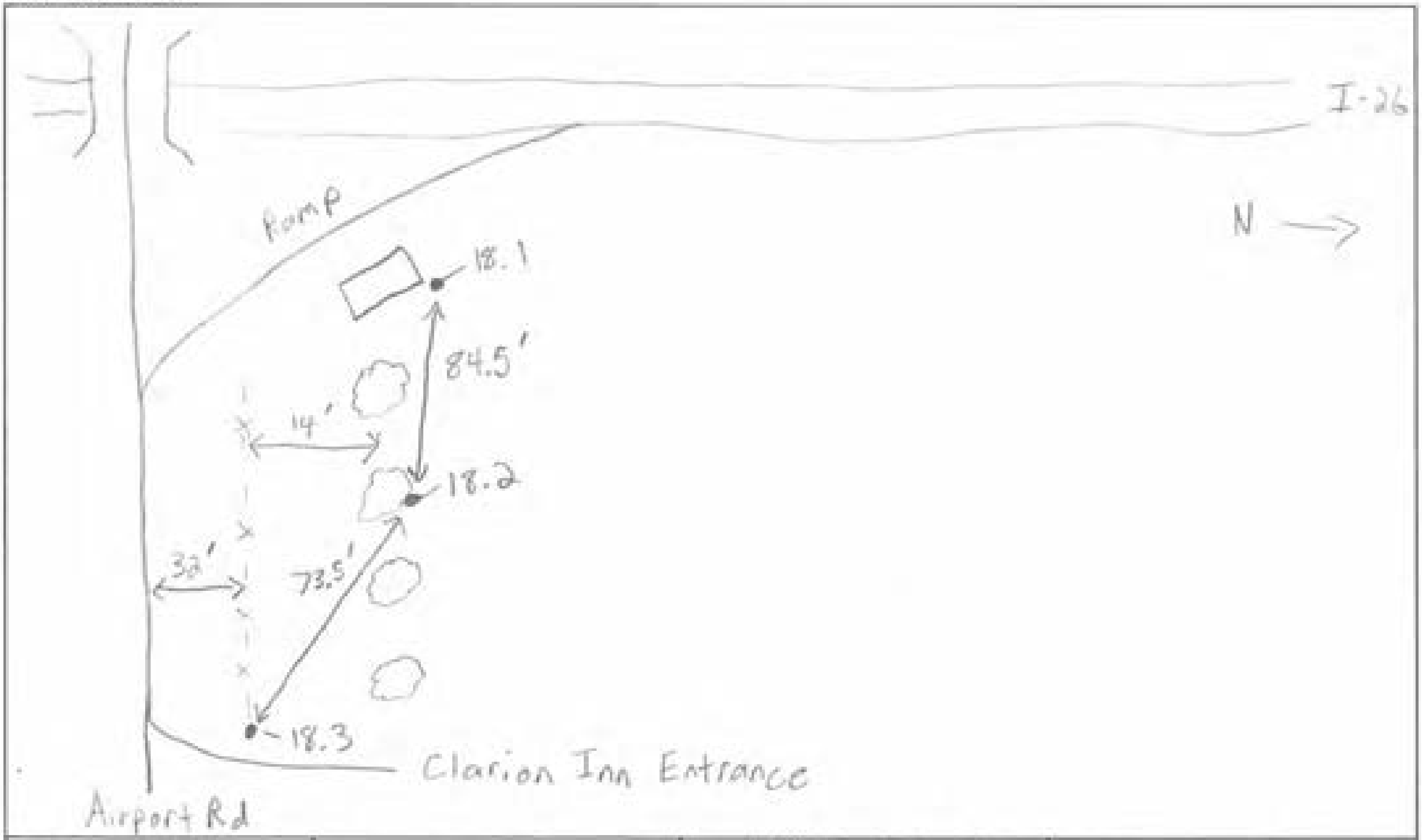
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA			RAP
ROAD (Name/Dir)	Airport Rd	I-26	
AUTOS	370 EB 312 WB	367 NB 365 SB	206
MED TRKS	8 EB 12 WB	21 NB 17 SB	9
HVY TRKS	12 EB 12 WB	87 NB 35 SB	9
BUS	1 EB 1 WB	0 NB 0 SB	2
MOTORCYCLE	0 EB 2 WB	3 NB 5 SB	1
SPEED			

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA Duration 20 min Leq (dB) 67.9, 65.8, 68.0

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 73° HUMIDITY 74 %, CLOUD COVER Scattered Clo

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES New hotel construction nearby

Noise Monitoring Site 18

Airport Rd – Commercial

Noise Meter 18.1 Looking South

Noise Meter 18.2 Looking Southwest

Noise Meter 18.3 Looking Southwest

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 19.1-3 DATE: 6/2/14 TIME: 15:50-16:10

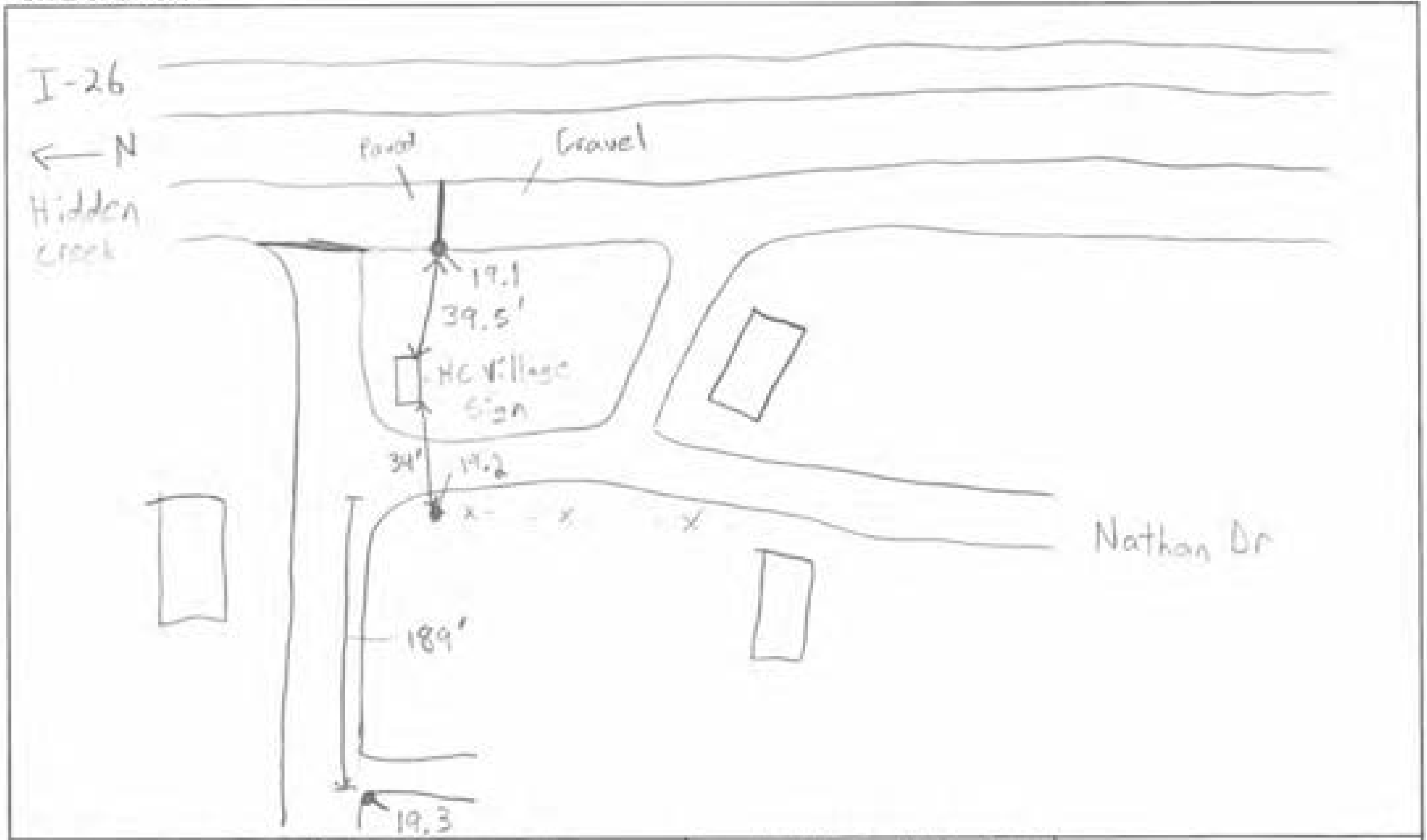
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	800 NB 745 SB
MED TRKS	___EB ___WB	20 NB 15 SB
HVY TRKS	___EB ___WB	104 NB 65 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	5 NB 5 SB
SPEED		

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 67.5, 66.0, 62.0	

WEATHER DATA WIND SPEED (MPH) 3 mph DIR. NE TEMP. 77° HUMIDITY 37% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Go Kart (4'), Dog Barking (13'), Loud Car (18')

OTHER NOTES

Noise Monitoring Site 19

Hidden Creek Dr – Single Family Residential

06/02/2014

Noise Meter 19.1 Looking West

06/02/2014

Noise Meter 19.2 Looking East

06/02/2014

Noise Meter 19.3 Looking East

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 20.1-3 DATE: 6/2/14 TIME: 16:55 - 17:15

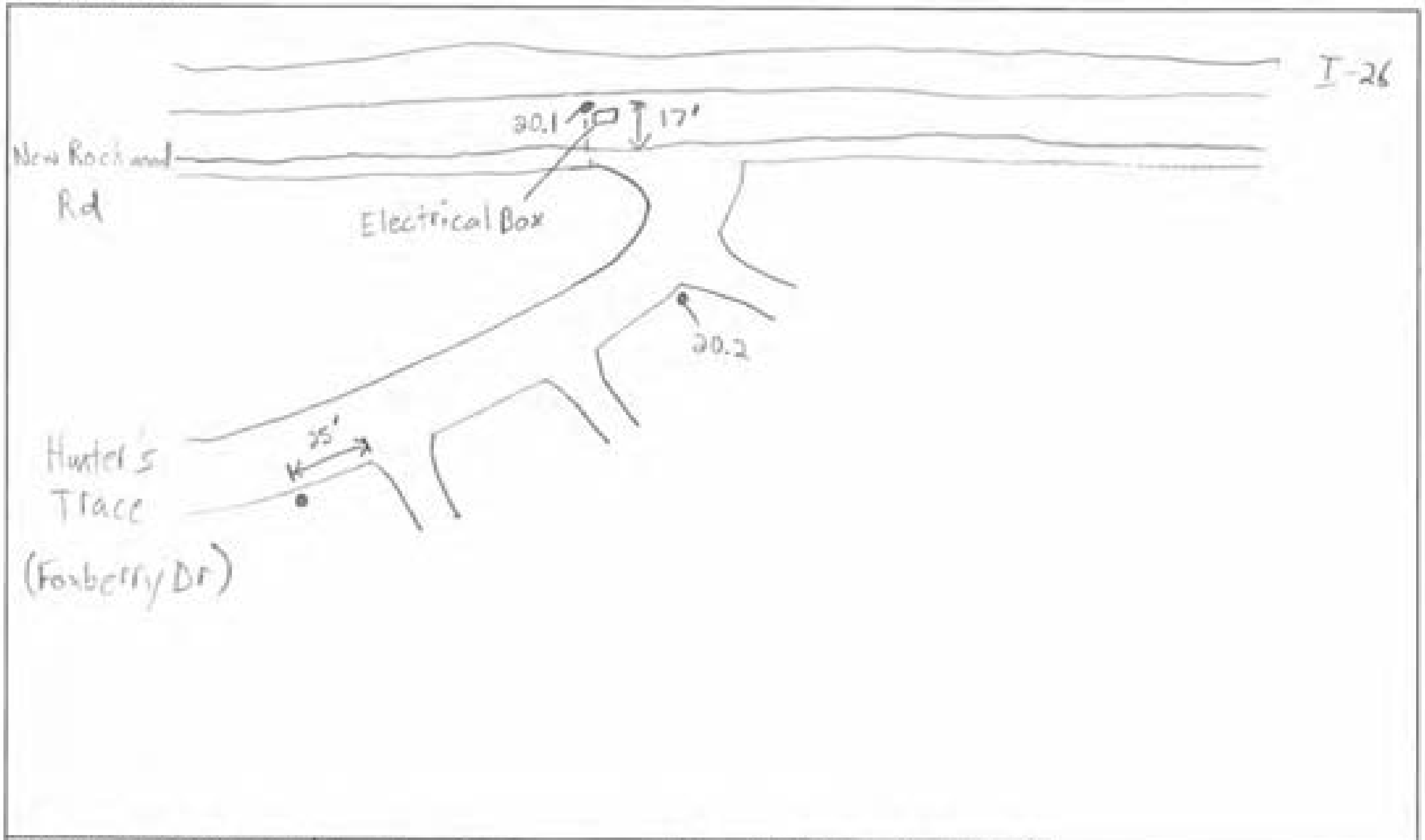
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	22 EB NB 10 WB	831 NB 858 SB
MED TRKS	2 EB 0 WB	16 NB 17 SB
HVY TRKS	3 EB 0 WB	110 NB 52 SB
BUS	0 EB 0 WB	0 NB 0 SB
MOTORCYCLE	2 EB 0 WB	2 NB 2 SB
SPEED	35	65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA | Duration 20 min | Leq (dB) 76.0, 66.4, 62.3

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 78° HUMIDITY 37% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Motorcycle (7'), Truck Idling (14')

OTHER NOTES

Noise Monitoring Site 20

Foxberry Dr – Single Family Residential

Noise Meter 20.1 Looking West

Noise Meter 20.2 Looking West

Noise Meter 20.3 Looking Northwest

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 21.1-3 DATE: 6/2/14 TIME: 18:05 - 18:25

CALIBRATION: 94.0 dB.

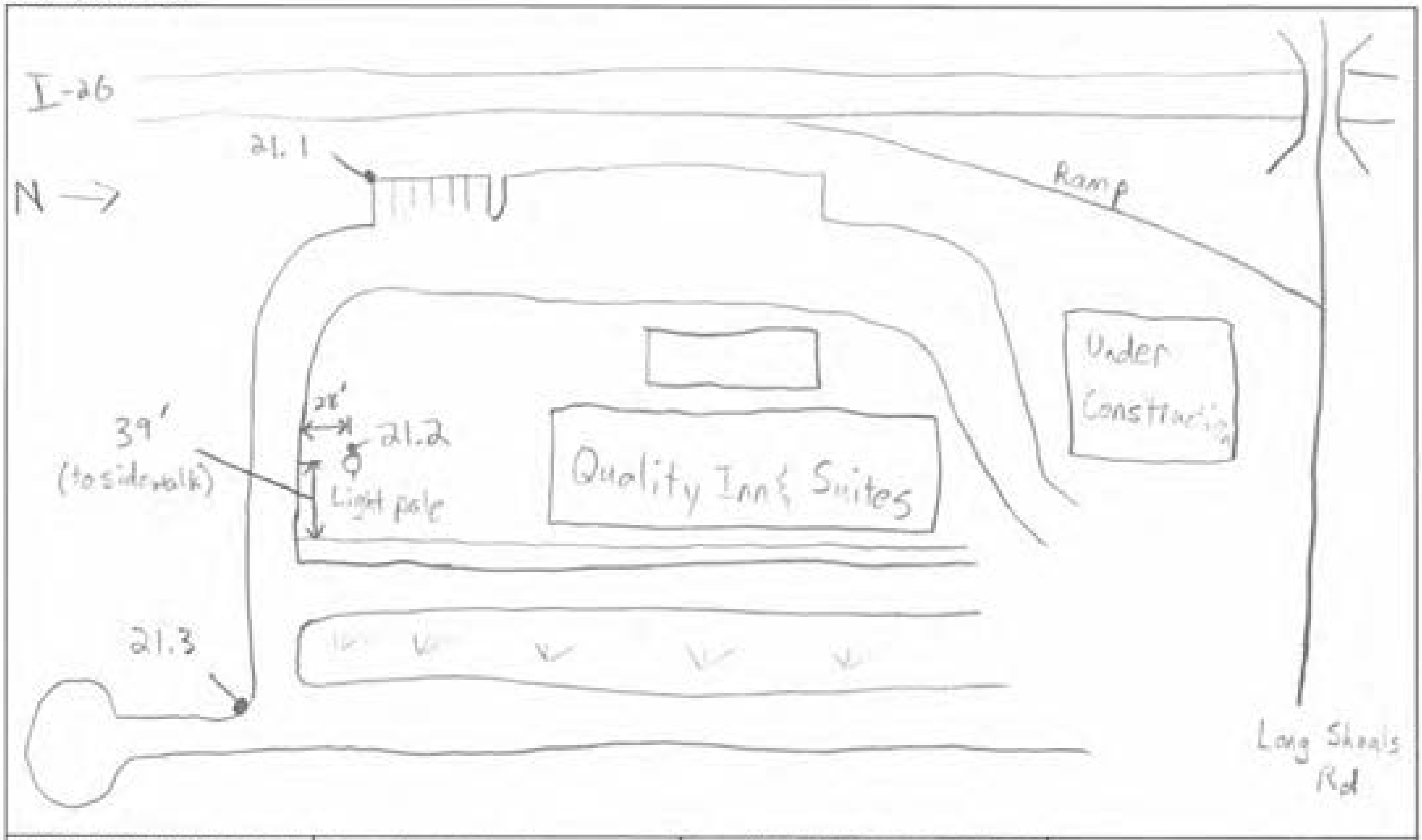
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA			RAMP
ROAD (Name/Dir)		I-26	
AUTOS	___ EB ___ WB	520 NB 494 SB	152
MED TRKS	___ EB ___ WB	16 NB 27 SB	1
HVY TRKS	___ EB ___ WB	74 NB 60 SB	0
BUS	___ EB ___ WB	0 NB 0 SB	1
MOTORCYCLE	___ EB ___ WB	2 NB 1 SB	0
SPEED		65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 66.8, 59.1, 54.5	

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 76° HUMIDITY 37% CLOUD COVER Clear

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS People chatting (11')

OTHER NOTES New health center construction nearby

Noise Monitoring Site 21

Skyland Inn Dr – Commercial

Noise Meter 21.1 Looking West

Noise Meter 21.2 Looking West

Noise Meter 21.3 Looking West

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 22.1-3 DATE: 6/3/14 TIME: 9:05-9:25

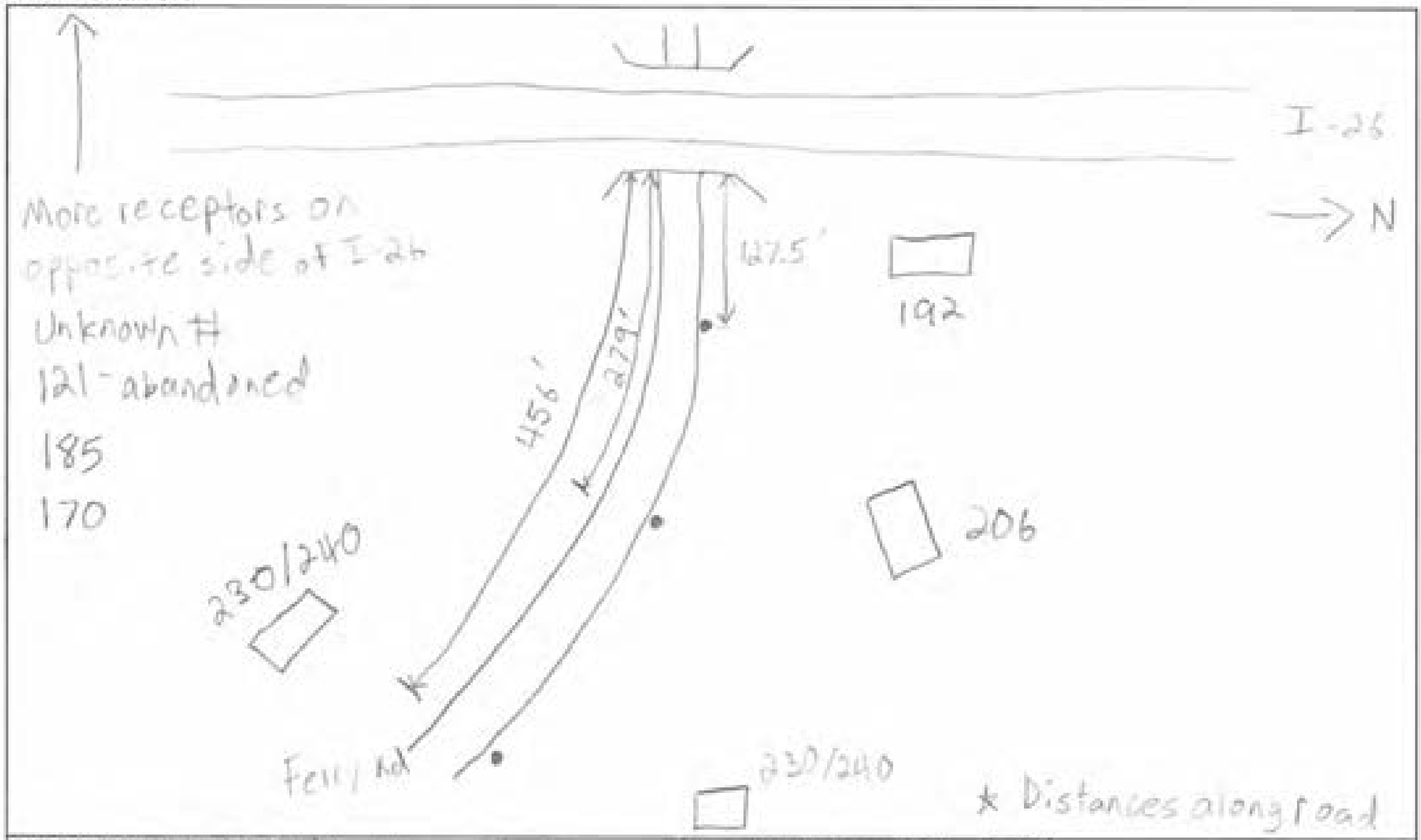
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	572 NB 544 SB
MED TRKS	___EB ___WB	27 NB 26 SB
HVY TRKS	___EB ___WB	68 NB 48 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	1 NB 0 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 62.1, 59.4, 56.6

WEATHER DATA WIND SPEED (MPH) Calm DIR. TEMP. 70° HUMIDITY 41% CLOUD COVER Overcast

BACKGROUND NOISE

MAJOR SOURCES I-26

UNUSUAL EVENTS Car (8') Car (14' - 22.1 only)

OTHER NOTES

Noise Monitoring Site 22

Ferry Rd – Single Family Residential

Noise Meter 22.1 Looking Southwest

Noise Meter 22.2 Looking North

Noise Meter 22.3 Looking West

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 23.1-3 DATE: 6/13/14 TIME: 10:15 - 10:35

CALIBRATION: 94.0 dB.

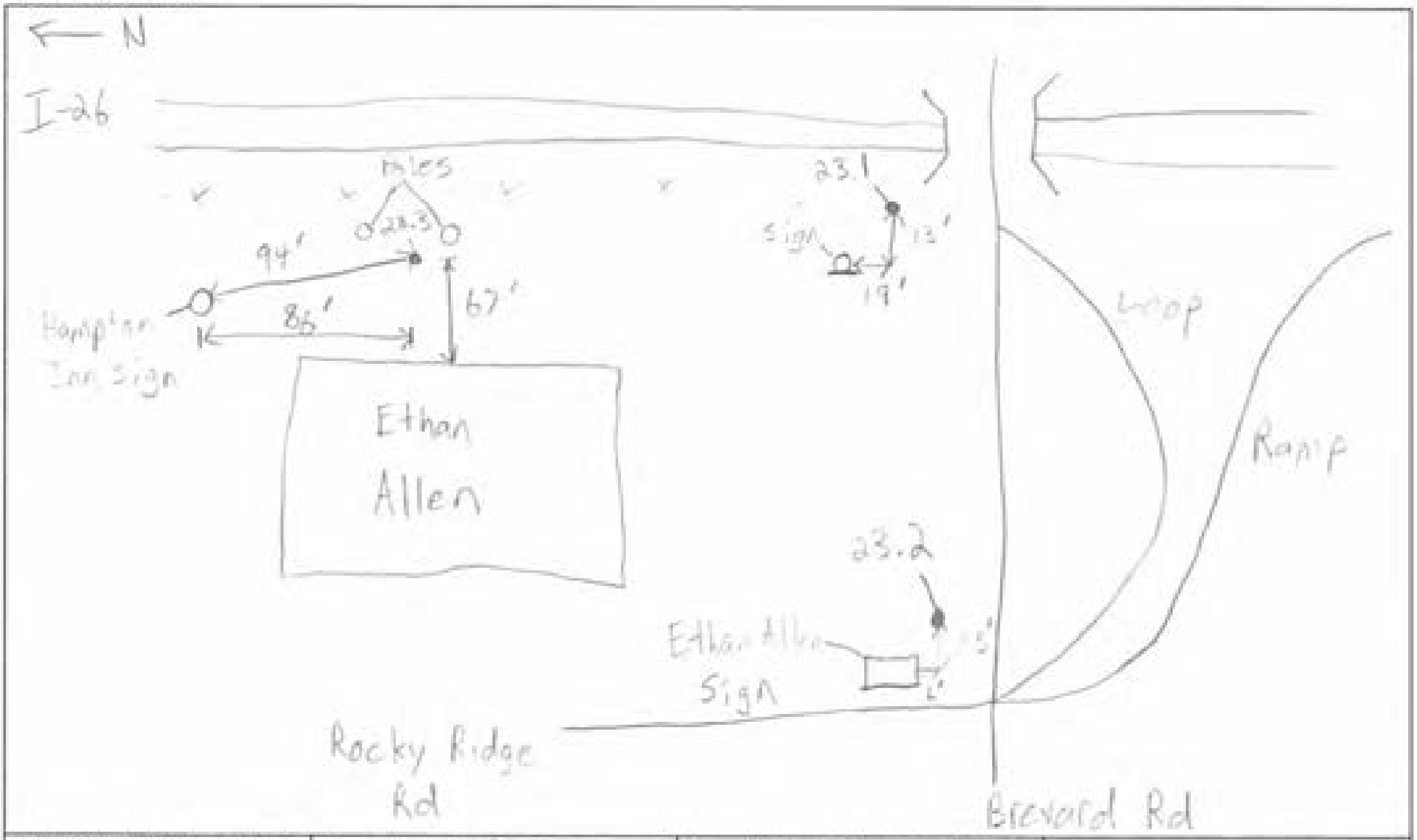
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

Loop	TRAFFIC DATA			Ramp
	ROAD (Name/Dir)	Brevard Rd	I-26	
151	AUTOS	231 EB 162 WB	551 NB 483 SB	71
2	MED TRKS	11 EB 4 WB	27 NB 16 SB	3
1	HVY TRKS	6 EB 8 WB	81 NB 84 SB	1
1	BUS	0 EB 0 WB	6 NB 0 SB	0
2	MOTORCYCLE	0 EB 0 WB	1 NB 1 SB	1
	SPEED	45	65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA | Duration 20 min | Leq (dB) 70.3, 69.0, 65.2

WEATHER DATA WIND SPEED (MPH) 3 DIR. NE TEMP. 70° HUMIDITY 76% CLOUD COVER Mostly Cloudy

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS

OTHER NOTES

Picture order: 23.3, 23.2, 23.1

Noise Monitoring Site 23

Brevard Rd – Commercial

Noise Meter 23.1 Looking Southeast

Noise Meter 23.2 Looking Northeast

Noise Meter 23.3 Looking Northwest

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 24.1-3 DATE: 6/3/14 TIME: 11:55 - 12:15

CALIBRATION: 94.0 dB.

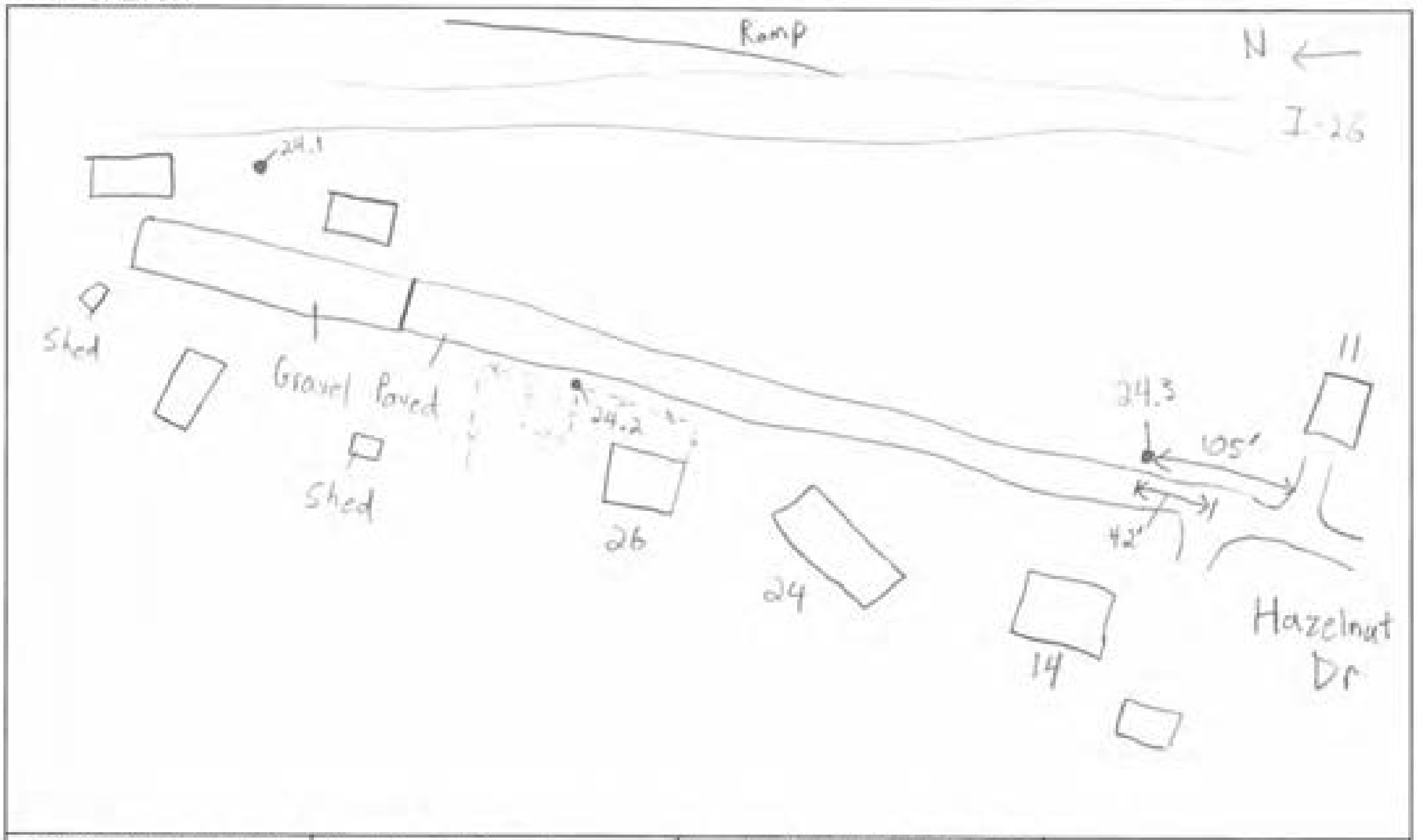
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA			
ROAD (Name/Dir)		I-26	RAMP
AUTOS	___ EB ___ WB	468 NB 600 SB	98
MED TRKS	___ EB ___ WB	16 NB 26 SB	5
HVY TRKS	___ EB ___ WB	69 NB 88 SB	6
BUS	___ EB ___ WB	1 NB 0 SB	1
MOTORCYCLE	___ EB ___ WB	3 NB 3 SB	0
SPEED		65	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 63.9, 64.3, 60.2

WEATHER DATA WIND SPEED (MPH) 3 DIR. SE TEMP. 72° HUMIDITY 75% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Car (18'/19')

OTHER NOTES

Noise Monitoring Site 24

Hazelnut Dr – Single Family Residential

Noise Meter 24.1 Looking Southeast

Noise Meter 24.2 Looking Southwest

Noise Meter 24.3 Looking North

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 25.1-3 DATE: 6/5/14 TIME: 14:40 - 15:00

CALIBRATION: 94.0 dB.

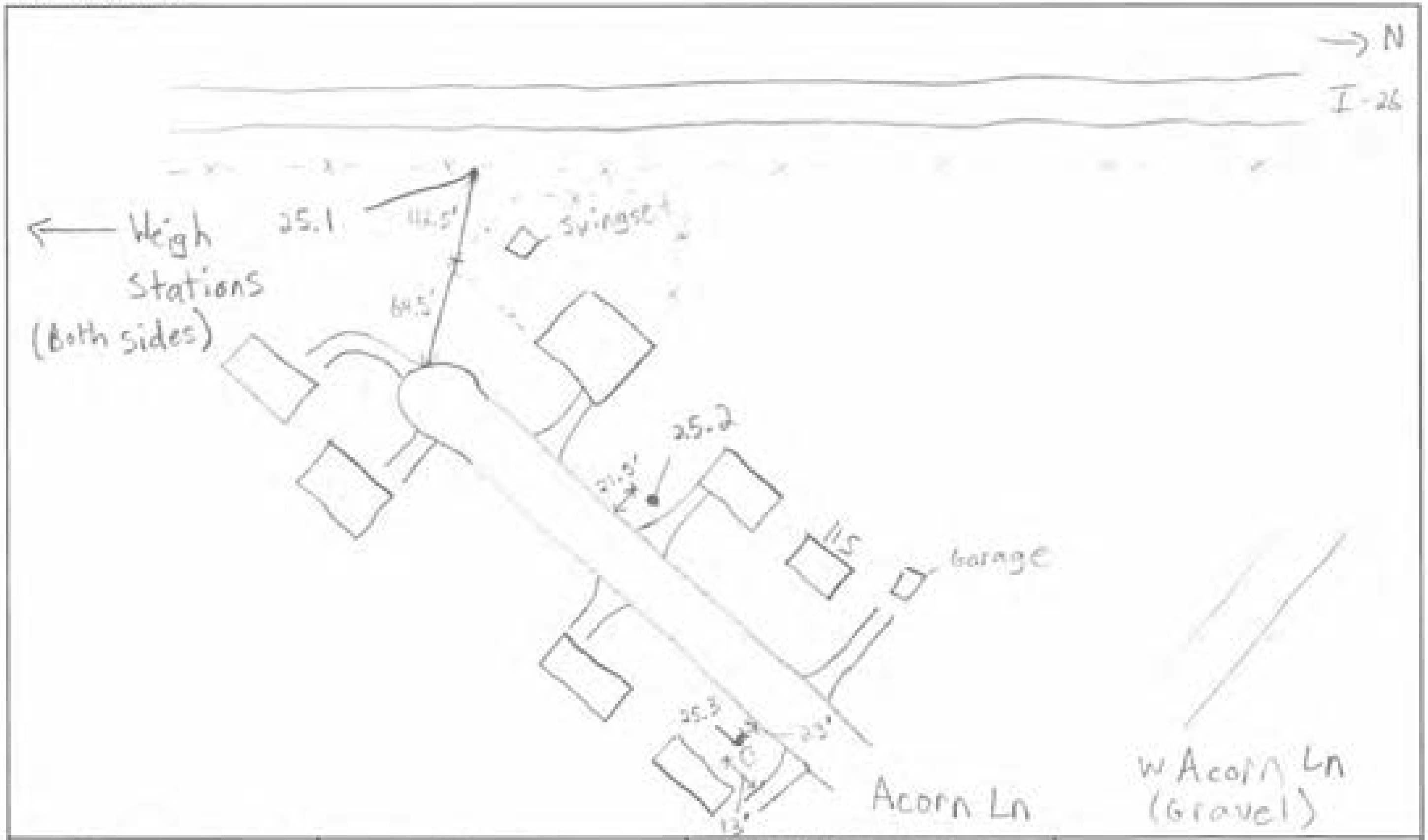
RESPONSE: FAST / [✓ SLOW]

WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA		
ROAD (Name/Dir)		I-26
AUTOS	___EB ___WB	578 NB 574 SB
MED TRKS	___EB ___WB	21 NB 15 SB
HVY TRKS	___EB ___WB	64 NB 63 SB
BUS	___EB ___WB	0 NB 0 SB
MOTORCYCLE	___EB ___WB	3 NB 0 SB
SPEED		65

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 69.5, 61.9, 60.0	

WEATHER DATA WIND SPEED (MPH) 5 DIR. SE TEMP. 81° HUMIDITY 59% CLOUD COVER Scattered Cloud

BACKGROUND NOISE Birds

MAJOR SOURCES

UNUSUAL EVENTS Siren (7')

OTHER NOTES

Pictures: 25.1, 25.2, 25.3

Noise Monitoring Site 25

Acorn Dr – Single Family Residential

Noise Meter 25.1 Looking Northwest

Noise Meter 25.2 Looking South

Noise Meter 25.3 Looking Southeast

HNTB

NOISE MEASUREMENT DATA SHEET

PROJECT: I-4400/4700 JOB #: 41470 BY: Trey Jordan

SITE: 26.1-3 DATE: 6/5/14 TIME: 16:10-16:30

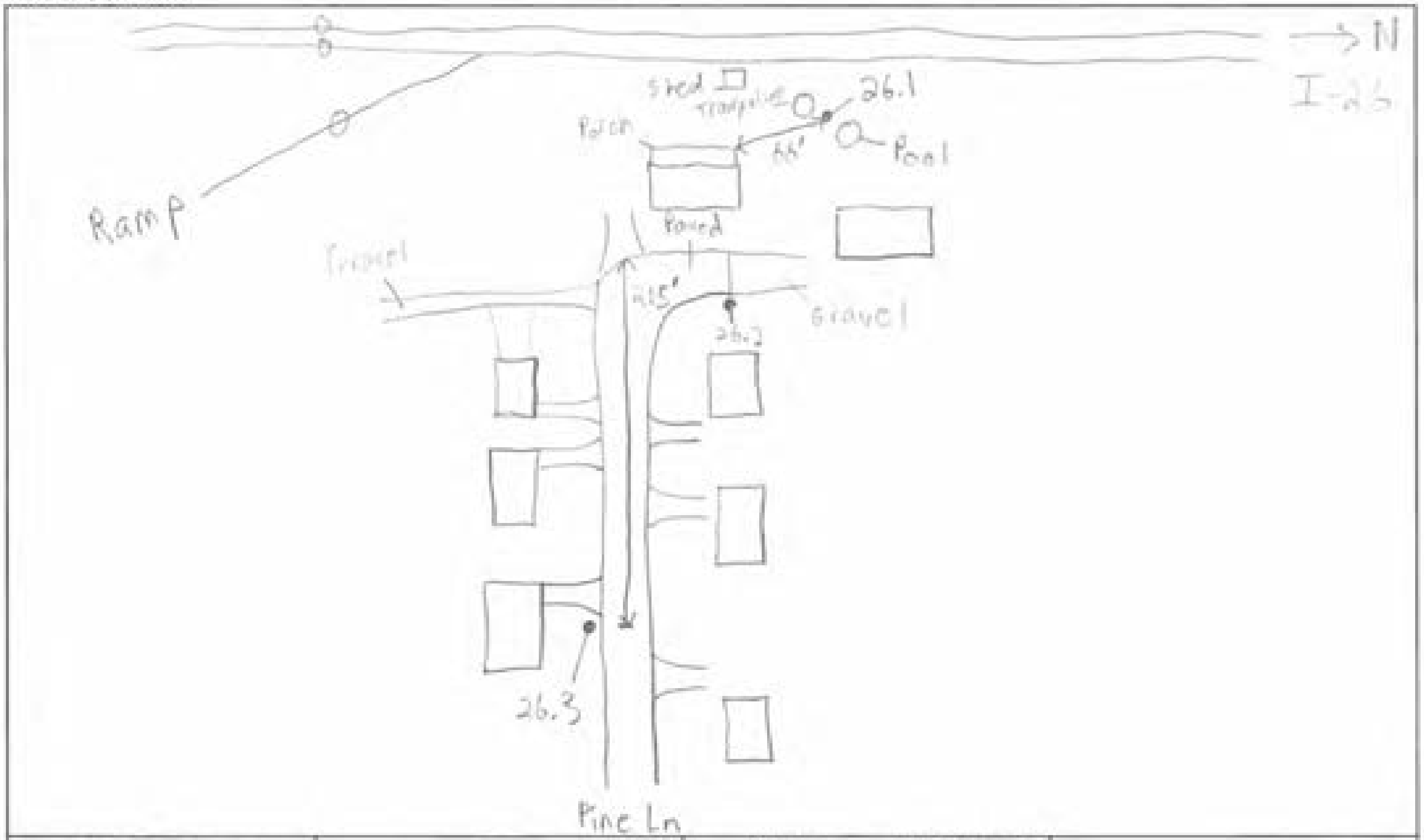
CALIBRATION: 94.0 dB.

RESPONSE: FAST / [✓ SLOW] WEIGHTING: [✓ A] / C / LIN.

TRAFFIC DATA			
ROAD (Name/Dir)		I-26	NB RAMP
AUTOS	___EB ___WB	837 NB 892 SB	145
MED TRKS	___EB ___WB	17 NB 30 SB	4
HVY TRKS	___EB ___WB	62 NB 65 SB	4
BUS	___EB ___WB	0 NB 1 SB	0
MOTORCYCLE	___EB ___WB	4 NB 5 SB	0
SPEED		60	

EQUIPMENT	
INSTRUMENT	See Site 0.1-3
SLM MANUFACTURER	
SLM MODEL	
SLM	
PREAMPLIFIER – Type 1206	
MICROPHONE – Type 1225	
CALIBRATOR – Type 1251	

SITE SKETCH



MEASUREMENT DATA	Duration 20 min	Leq (dB) 64.0, 61.5, 56.5	

WEATHER DATA WIND SPEED (MPH) 2 DIR. S TEMP. 76° HUMIDITY 74% CLOUD COVER Scattered Clouds

BACKGROUND NOISE

MAJOR SOURCES

UNUSUAL EVENTS Man shouting (3'), Dog (10'), Dog (16'), Kids talking (19-20')

OTHER NOTES

Pictures: Wrong, 26.3, 26.2, 26.1

Noise Monitoring Site 26

Pine Ln – Single Family Residential

Noise Meter 26.1 Looking Southeast

Noise Meter 26.2 Looking Northwest

Noise Meter 26.3 Looking West

Scantek, Inc.
CALIBRATION LABORATORY
ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®
NVLAP Lab Code: 200625-0

Calibration Certificate No.30299

Instrument: **Sound Level Meter**
Model: **NL32**
Manufacturer: **Rion**
Serial number: **01161899**
Tested with: **Microphone UC53A s/n 311127**
Preamplifier NH21 s/n 21932
Type (class): **1**
Customer: **Scantek, Inc.**
Tel/Fax: **410-290-7726 / 410-290-9167**

Date Calibrated: **1/7/2014** *Cal Due:* **1/7/2015**

Status:	**Received**	**Sent**
In tolerance:	**X**	**X**
Out of tolerance:		
See comments:		

Contains non-accredited tests: __ **Yes** _X_ **No**
Calibration service: __ **Basic** _X_ **Standard**
Address: **6430 Dobbin Road, Suite C,**
Columbia, MD 21045

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	Cal. Due
				Cal. Lab / Accreditation	
4838-Norsonic	SME Cal Unit	31052	Oct 7, 2013	Scantek, Inc./ NVLAP	Oct 7, 2014
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2014
HM30-Thommen	Meteo Station	1040170/39633	Sep 30,2013	ACR Env./ A2LA	Sep 30, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
24.2 °C	101.06 kPa	30.0 %RH

Calibrated by:	Lydon Dawkins	**Authorized signatory:**	Mariana Buzduga
Signature		Signature	
Date	01/7/2014	Date	1/8/2014

Results summary: Device complies with following clauses of mentioned specifications:

CLAUSES[1] FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT[2,3]	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
CALIBRATION OF SOUND LEVEL METER - ANSI S1.4 CLAUSE 3.2	Passed	0.2
INPUT AMPLIFIER TEST: GAIN TEST / ATTENUATOR SETTING - ANSI S1.4-1983 CLAUSE 5.3	Passed	0.25
LEVEL LINEARITY TEST - ANSI S1.4-1983, CLAUSE 6.9 & 6.10	Passed	0.25
WEIGHTING NETWORK TEST: A NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: C NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: LINEAR NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
OVERLOAD DETECTOR TEST: A-NETWORK - ANSI S1.4-1983 CLAUSE 8.3.1	Passed	0.25
F/S/I/PEAK TEST: STEADY STATE RESPONSE - ANSI S1.4 1983 CLAUSE 6.4	Passed	0.25
FAST-SLOW TEST: OVERSHOOT TEST - ANSI S1.4 1983 CLAUSE 8.4.1	Passed	0.25
FAST-SLOW TEST: SINGLE SINE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.1 & 8.4.3	Passed	0.25
PEAK DETECTOR TEST, SINGLE SQUARE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.4	Passed	0.25
RMS DETECTOR TEST: CREST FACTOR TEST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
RMS DETECTOR TEST: CONTINUOUS SINE WAVE BURST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
TIME AVERAGING TEST: AVERAGING FUNCTIONS - ANSI S1.43 CLAUSE 9.3.2	Passed	0.25
LINEARITY TEST - ANSI S1.43 CLAUSE 9.3.3	Passed	0.15
SUMMATION OF ACOUSTIC TESTS - ANSI S1.4 CLAUSE 5 USING ACTUATOR	Passed	0.2-0.5

[1] The results of this calibration apply only to the instrument type with serial number identified in this report.

[2] Parameters are certified at actual environmental conditions.

[3] The tests marked with (*) are not covered by the current NVLAP accreditation.

Comments: The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.
Compliance with any standard cannot be claimed based solely on the periodic tests.

Tests made with the following attachments to the instrument:

Microphone: Rion UC53A s/n 311127 for acoustical test
Preamplifier: Rion NH21 s/n 21932 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests
Accompanying acoustical calibrator: none
Windscreen: none

Measured Data: in Test Report # 30299 of 8 + 1 pages.

Place of Calibration: Scantek, Inc.
6430 Dobbin Road, Suite C
Columbia, MD 21045 USA
Ph/Fax: 410-290-7726/ -9167
callab@scantekinc.com

Scantek, Inc.
CALIBRATION LABORATORY

ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®

NVLAP Lab Code: 200625-0

Calibration Certificate No.30373

Instrument:	**Sound Level Meter**
Model:	**NL32**
Manufacturer:	**Rion**
Serial number:	**01161900**
Tested with:	**Microphone UC53A s/n 311130** **Preamplifier NH21 s/n 21933**
Type (class):	**1**
Customer:	**Scantek, Inc.**
Tel/Fax:	**410-290-7726 / 410-290-9167**

Date Calibrated: **1/20/2014** *Cal Due:* **1/20/2015**

Status:	**Received**	**Sent**
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __**Yes** **X** **No**

Calibration service: __ **Basic** **X** **Standard**

Address: **6430 Dobbin Road, Suite C,**
Columbia, MD 21045

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
483B-Norsonic	SME Cal Unit	31052	Oct 7, 2013	Scantek, Inc./ NVLAP	Oct 7, 2014
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2014
HM30-Thommen	Meteo Station	1040170/39633	Sep 30,2013	ACR Env./ A2LA	Sep 30, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.3 °C	99.570 kPa	33.3 %RH

Calibrated by:	Lydon Dawkins	**Authorized signatory:**	Mariana Buzduga
Signature	Lydon Dawkins	Signature	
Date	01/21/2014	Date	1/22/2014

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Results summary: Device complies with following clauses of mentioned specifications:

CLAUSES[1] FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT[2,3]	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
CALIBRATION OF SOUND LEVEL METER - ANSI S1.4 CLAUSE 3.2	Passed	0.2
INPUT AMPLIFIER TEST: GAIN TEST / ATTENUATOR SETTING - ANSI S1.4-1983 CLAUSE 5.3	Passed	0.25
LEVEL LINEARITY TEST - ANSI S1.4-1983, CLAUSE 6.9 & 6.10	Passed	0.25
WEIGHTING NETWORK TEST: A NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: C NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: LINEAR NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
OVERLOAD DETECTOR TEST: A-NETWORK - ANSI S1.4-1983 CLAUSE 8.3.1	Passed	0.25
F/S/I/PEAK TEST: STEADY STATE RESPONSE - ANSI S1.4 1983 CLAUSE 6.4	Passed	0.25
FAST-SLOW TEST: OVERSHOOT TEST - ANSI S1.4 1983 CLAUSE 8.4.1	Passed	0.25
FAST-SLOW TEST: SINGLE SINE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.1 & 8.4.3	Passed	0.25
PEAK DETECTOR TEST, SINGLE SQUARE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.4	Passed	0.25
RMS DETECTOR TEST: CREST FACTOR TEST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
RMS DETECTOR TEST: CONTINUOUS SINE WAVE BURST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
TIME AVERAGING TEST: AVERAGING FUNCTIONS - ANSI S1.43 CLAUSE 9.3.2	Passed	0.25
LINEARITY TEST - ANSI S1.43 CLAUSE 9.3.3	Passed	0.15
SUMMATION OF ACOUSTIC TESTS - ANSI S1.4 CLAUSE 5 USING ACTUATOR	Passed	0.2-0.5

[1] The results of this calibration apply only to the instrument type with serial number identified in this report.

[2] Parameters are certified at actual environmental conditions.

[3] The tests marked with (*) are not covered by the current NVLAP accreditation.

Comments: The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.
Compliance with any standard cannot be claimed based solely on the periodic tests.

Tests made with the following attachments to the instrument:

Microphone: Rion UC53A s/n 311130 for acoustical test
Preamplifier: Rion NH21 s/n 21933 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests
Accompanying acoustical calibrator: none
Windscreen: none

Measured Data: in Test Report # 30373 of 8 + 1 pages.

Place of Calibration: Scantek, Inc.
6430 Dobbin Road, Suite C
Columbia, MD 21045 USA

Ph/Fax: 410-290-7726/ -9167
callab@scantekinc.com

Scantek, Inc.
CALIBRATION LABORATORY
ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1
ACCREDITED by NVLAP (an ILAC MRA signatory)

NVLAP®

NVLAP Lab Code: 200625-0

Calibration Certificate No.30375

Instrument: **Sound Level Meter**
Model: **NL32**
Manufacturer: **Rion**
Serial number: **00282514**
Tested with: **Microphone UC53A s/n 313875**
Preamplifier NH21 s/n 26713
Type (class): **1**
Customer: **Scantek, Inc.**
Tel/Fax: **410-290-7726 / 410-290-9167**

Date Calibrated: **1/21/2014** *Cal Due:* **1/21/2015**

Status:	**Received**	**Sent**
In tolerance:	X	X
Out of tolerance:		
See comments:		

Contains non-accredited tests: __Yes X No
Calibration service: __ Basic X Standard
Address: **6430 Dobbin Road, Suite C,**
Columbia, MD 21045

Tested in accordance with the following procedures and standards:
Calibration of Sound Level Meters, Scantek Inc., Rev. 6/22/2012
SLM & Dosimeters – Acoustical Tests, Scantek Inc., Rev. 7/6/2011

Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence Cal. Lab / Accreditation	Cal. Due
4838-Norsonic	SME Cal Unit	31052	Oct 7, 2013	Scantek, Inc./ NVLAP	Oct 7, 2014
DS-360-SRS	Function Generator	33584	Sep 30, 2013	ACR Env./ A2LA	Sep 30, 2015
34401A-Agilent Technologies	Digital Voltmeter	US36120731	Sep 30, 2013	ACR Env. / A2LA	Sep 30, 2014
HM30-Thommen	Meteo Station	1040170/39633	Sep 30,2013	ACR Env./ A2LA	Sep 30, 2014
PC Program 1019 Norsonic	Calibration software	v.5.2	Validated Mar 2011	Scantek, Inc.	-
1251-Norsonic	Calibrator	30878	Nov 8, 2013	Scantek, Inc./ NVLAP	Nov 8, 2014

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

Environmental conditions:

Temperature (°C)	Barometric pressure (kPa)	Relative Humidity (%)
23.4 °C	99.280 kPa	32.6 %RH

Calibrated by:	Lydon Dawkins	**Authorized signatory:**	Mariana Buzduga
Signature	Lydon Dawkins	Signature	
Date	01/21/2014	Date	1/22/2014

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory.
This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.
Document stored Z:\Calibration Lab\SLM 2014\RIONL32_00282514_M1.doc

Page 1 of 2

Results summary: Device complies with following clauses of mentioned specifications:

CLAUSES[1] FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	RESULT[2,3]	EXPANDED UNCERTAINTY (coverage factor 2) [dB]
CALIBRATION OF SOUND LEVEL METER - ANSI S1.4 CLAUSE 3.2	Passed	0.2
INPUT AMPLIFIER TEST: GAIN TEST / ATTENUATOR SETTING - ANSI S1.4-1983 CLAUSE 5.3	Passed	0.25
LEVEL LINEARITY TEST - ANSI S1.4-1983, CLAUSE 6.9 & 6.10	Passed	0.25
WEIGHTING NETWORK TEST: A NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: C NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
WEIGHTING NETWORK TEST: LINEAR NETWORK - ANSI S1.4-1983 CLAUSE 8.2.1	Passed	0.25
OVERLOAD DETECTOR TEST: A-NETWORK - ANSI S1.4-1983 CLAUSE 8.3.1	Passed	0.25
F/S/I/PEAK TEST: STEADY STATE RESPONSE - ANSI S1.4 1983 CLAUSE 6.4	Passed	0.25
FAST-SLOW TEST: OVERSHOOT TEST - ANSI S1.4 1983 CLAUSE 8.4.1	Passed	0.25
FAST-SLOW TEST: SINGLE SINE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.1 & 8.4.3	Passed	0.25
PEAK DETECTOR TEST, SINGLE SQUARE WAVE BURST - ANSI S1.4 1983 CLAUSE 8.4.4	Passed	0.25
RMS DETECTOR TEST: CREST FACTOR TEST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
RMS DETECTOR TEST: CONTINUOUS SINE WAVE BURST - ANSI S1.4-1983 CLAUSE 8.4.2	Passed	0.25
TIME AVERAGING TEST: AVERAGING FUNCTIONS - ANSI S1.43 CLAUSE 9.3.2	Passed	0.25
LINEARITY TEST - ANSI S1.43 CLAUSE 9.3.3	Passed	0.15
SUMMATION OF ACOUSTIC TESTS - ANSI S1.4 CLAUSE 5 USING ACTUATOR	Passed	0.2-0.5

[1] The results of this calibration apply only to the instrument type with serial number identified in this report.

[2] Parameters are certified at actual environmental conditions.

[3] The tests marked with (*) are not covered by the current NVLAP accreditation.

Comments: The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger.
Compliance with any standard cannot be claimed based solely on the periodic tests.

Tests made with the following attachments to the instrument:

Microphone: Rion UC53A s/n 313875 for acoustical test
Preamplifier: Rion NH21 s/n 26713 for all tests
Other: line adaptor ADP005 (18pF) for electrical tests
Accompanying acoustical calibrator: none
Windscreen: none

Measured Data: in Test Report # 30375 of 8 + 1 pages.

Place of Calibration: Scantek, Inc.
6430 Dobbin Road, Suite C
Columbia, MD 21045 USA

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Appendix B

Hourly Equivalent Traffic Noise Levels

Table B-1: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 1

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-001	Res.	B	1	418 Felmet Rd	62	63	64	2
R-002	Res.	B	1	400 Felmet Rd	61	63	63	2
R-003	Res.	B	1	276 Felmet Rd	61	63	63	2
R-004	Res.	B	1	27 Bennison Ln	61	63	63	2
R-005	Res.	B	1	59 Bennison Ln	63	65	65	2
R-006	Res.	B	1	79 Bennison Ln	68	70	**70**	2
R-007	Res.	B	1	107 Bennison Ln	69	71	**71**	2
R-008	Res.	B	1	30 Bennison Ln	60	62	63	3
R-009	Res.	B	1	70 Bennison Ln	63	65	65	2
R-010	Res.	B	1	96 Bennison Ln	66	68	**68**	2
R-011	Res.	B	1	106 Bennison Ln	71	73	**73**	2
R-012	Res.	B	1	612 Crest Rd	67	68	**68**	1
R-013	Res.	B	1	622 Crest Rd	60	61	60	0
R-014	Res.	B	1	620 Crest Rd	65	66	**66**	1
Predicted NSA 1 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							6[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 1 = 6.

Table B-2: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 2

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-015	Res.	B	1	364 Mcmurray Rd	63	63	64	1
R-016	Res.	B	1	412 Mcmurray Rd	60	61	61	1
R-017	Res.	B	1	819 Mcmurray Rd	63	64	64	1
R-018	Res.	B	1	823 Mcmurray Rd	70	70	71	1
R-019	Res.	B	1	35 Justus Acres Ln	62	63	63	1
R-020	Res.	B	1	28 Randolph Ave	63	63	63	0
R-021	Res.	B	1	30 Justus Acres Ln	64	65	65	1
R-022	Res.	B	1	19 Justus Acres Ln	65	65	66	1
R-023	Res.	B	1	818 Tracy Grove Rd	67	67	68	1
R-024	Res.	B	1	824 Tracy Grove Rd	65	65	66	1
R-025	Res.	B	1	821 Tracy Grove Rd	64	64	65	1
R-026	Res.	B	1	809 Mid Allen Rd	76	76	77	1
R-027	Res.	B	1	837 Mid Allen Rd	66	66	67	1
R-028	Res.	B	1	282 Katie Dr	64	64	65	1
R-029	Res.	B	1	33 Springside Dr	66	66	67	1
R-030	Res.	B	1	31 Springside Dr	65	65	66	1
R-031	Res.	B	1	29 Springside Dr	63	63	64	1
R-032	Res.	B	1	27 Springside Dr	61	61	62	1
R-033	Res.	B	1	25 Springside Dr	60	60	61	1
R-034	Res.	B	1	16 Springside Dr	60	61	62	2
R-035	Res.	B	1	18 Springside Dr	61	61	62	1
R-036	Res.	B	1	20 Springside Dr	62	62	64	2
R-037	Res.	B	1	22 Springside Dr	63	63	64	1
R-038	Res.	B	1	24 Springside Dr	64	64	65	1
R-039	Res.	B	1	26 Springside Dr	66	66	67	1
R-040	Res.	B	1	28 Springside Dr	69	69	70	1
R-041	Res.	B	1	30 Springside Dr	70	70	70	0
R-042	Res.	B	1	32 Springside Dr	69	69	69	0
R-043	Res.	B	1	34 Springside Dr	66	66	67	1
R-044	Res.	B	1	36 Springside Dr	65	66	66	1
R-045	Res.	B	1	38 Springside Dr	65	66	66	1
R-046	Res.	B	1	40 Springside Dr	64	64	65	1
R-047	Res.	B	1	42 Springside Dr	61	62	62	1
R-048	Res.	B	1	44 Springside Dr	57	57	58	1

Table B-2: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 2

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-049	Res.	B	1	46 Springside Dr	56	56	57	1
R-050	Res.	B	1	43 Springside Dr	76	76	**75**	-1[5]
R-051	Res.	B	1	45 Springside Dr	76	76	**76**	0
R-052	Res.	B	1	47 Springside Dr	72	72	**73**	1
R-053	Res.	B	1	49 Springside Dr	70	71	**71**	1
R-054	Res.	B	1	152 Willowbrook Rd	67	68	**69**	2
R-055	Res.	B	1	150 Willowbrook Rd	72	73	**73**	1
R-056	Res.	B	1	148 Willowbrook Rd	73	74	**76**	3
R-057	Res.	B	1	146 Willowbrook Rd	72	73	**75**	3
R-058	Res.	B	1	144 Willowbrook Rd	70	70	**71**	1
R-059	Res.	B	1	142 Willowbrook Rd	71	71	**71**	0
R-060	Res.	B	1	138 Willowbrook Rd	68	69	**70**	2
R-061	Res.	B	1	134 Willowbrook Rd	67	67	**71**	4
R-062	Res.	B	1	130 Willowbrook Rd	70	71	**74**	4
R-063	Res.	B	1	126 Willowbrook Rd	71	71	**74**	3
R-064	Res.	B	1	122 Willowbrook Rd	70	71	**73**	3
R-065	Res.	B	1	118 Willowbrook Rd	73	73	**76**	3
R-066	Res.	B	1	114 Willowbrook Rd	70	71	**74**	4
R-067	Res.	B	1	110 Willowbrook Rd	70	71	**74**	4
R-068	Res.	B	1	106 Willowbrook Rd	71	71	**75**	4
R-069	Res.	B	1	102 Willowbrook Rd	71	71	**75**	4
R-070	Res.	B	1	59 Springside Dr	60	61	62	2
R-071	Res.	B	1	57 Springside Dr	50	51	53	3
R-072	Res.	B	1	55 Springside Dr	57	58	59	2
R-073	Res.	B	1	53 Springside Dr	65	65	**67**	2
R-074	Res.	B	1	147 Willowbrook Rd	63	63	65	2
R-075	Res.	B	1	145 Willowbrook Rd	62	62	65	3
R-076	Res.	B	1	131 Maywood Rd	59	59	62	3
R-077	Res.	B	1	127 Maywood Rd	55	55	58	3
R-078	Res.	B	1	123 Maywood Rd	52	53	56	4
R-079	Res.	B	1	119 Maywood Rd	57	57	59	2
R-080	Res.	B	1	116 Maywood Rd	51	51	54	3
R-081	Res.	B	1	120 Maywood Rd	47	47	49	2
R-082	Res.	B	1	124 Maywood Rd	50	50	53	3

Table B-2: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 2

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-083	Res.	B	1	133 Willowbrook Rd	57	57	60	3
R-084	Res.	B	1	129 Willowbrook Rd	58	58	61	3
R-085	Res.	B	1	121 Willowbrook Rd	58	58	62	4
R-086	Res.	B	1	117 Willowbrook Rd	62	63	65	3
R-087	Res.	B	1	113 Willowbrook Rd	62	62	65	3
R-088	Res.	B	1	109 Willowbrook Rd	63	63	65	2
R-089	Res.	B	1	105 Willowbrook Rd	64	65	**66**	2
R-090	Res.	B	1	710 Dana Rd	57	57	60	3
R-091	Res.	B	1	714 Dana Rd	56	57	59	3
R-092	Res.	B	1	703 Dana Rd	61	62	63	2
R-093	Res.	B	1	410 Lakeview Estate Rd	60	60	61	1
R-094	Res.	B	1	420 Lakeview Estate Rd	61	62	63	2
R-095	Res.	B	1	422 Lakeview Estate Rd	62	63	64	2
R-096	Res.	B	1	424 Lakeview Estate Rd	63	63	64	1
R-097	Res.	B	1	426 Lakeview Estate Rd	64	65	**66**	2
R-098	Res.	B	1	102 Wakefield Dr	62	63	64	2
R-099	Res.	B	1	99 Wakefield Dr	73	74	**75**	2
R-099	Res.	B	1	99 Wakefield Dr	73	74	**71**	2
R-100	Res.	B	1	418 E Prince Rd	69	70	**69**	2
R-101	Res.	B	1	419 Bird Haven Rd	67	67	65	2
R-102	Res.	B	1	417 Bird Haven Rd	63	64	61	2
R-103	Res.	B	1	414 Bird Haven Rd	59	59	60	2
R-104	Res.	B	1	416 Bird Haven Rd	58	59	60	2
R-105	Res.	B	1	25 Dove Valley Ln	58	58	59	1
R-106	Res.	B	1	23 Dove Valley Ln	58	58	62	1
R-107	Res.	B	1	81 Dove Valley Ln	61	62	**67**	2
R-108	Res.	B	1	420 Bird Haven Rd	65	66	**67**	2
R-109	Res.	B	1	424 Bird Haven Rd	65	66	**67**	2
R-110	Res.	B	1	411 Pine Hill Ln	65	66	**72**	2
R-111	Res.	B	1	508 E Prince Rd	70	70	**68**	2
R-112	Res.	B	1	510 E Prince Rd	66	66	63	2
R-113	Res.	B	1	520 E Prince Rd	61	62	64	2
R-114	Res.	B	1	518 E Prince Rd	62	62	62	2
R-115	Res.	B	1	524 E Prince Rd	60	60	**69**	1

Table B-2: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 2

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-116	Res.	B	1	527 E Prince Rd	68	68	65	1
R-117	Res.	B	1	529 E Prince Rd	64	64	62	1
R-118	Res.	B	1	539 E Prince Rd	61	61	60	1
R-119	Res.	B	1	601 E Prince Rd	59	59	**66**	2
R-120	Res.	B	1	635 E Prince Rd	64	64	**69**	2
R-121	Res.	B	1	641 E Prince Rd	67	68	**69**	2
Predicted NSA 2 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							50[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 2 = 50.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-3: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 3

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-122	Res.	B	1	54 Francis Rd	67	68	**69**	2
R-123	Res.	B	1	68 Francis Rd	62	62	64	2
R-124	Res.	B	1	76 Francis Rd	63	63	65	2
R-125	Res.	B	1	82 Francis Rd	61	61	63	2
R-126	Res.	B	1	51 High Country Ln	64	64	65	1
R-127	Res.	B	1	65 High Country Ln	64	64	65	1
R-128	Res.	B	1	75 High Country Ln	63	64	65	2
R-129	Res.	B	1	66 High Country Ln	58	58	59	1
R-130	Res.	B	1	121 High Country Ln	62	62	63	1
R-131	Res.	B	1	125 Francis Rd	63	63	64	1
R-132	Res.	B	1	129 Francis Rd	63	63	64	1
R-133	Res.	B	1	1713 Clear Creek Rd	71	71	**71**	0
R-134	Res.	B	1	1733 Clear Creek Rd	71	71	**71**	0
R-135	Res.	B	1	1803 Clear Creek Rd	74	74	**75**	1
R-136	Res.	B	1	1845 Clear Creek Rd	72	72	**72**	0
R-137	Res.	B	1	1869 Clear Creek Rd	69	69	**69**	0
R-138	Res.	B	1	1959 Clear Creek Rd	66	66	**66**	0
R-139	Res.	B	1	1982 Clear Creek Rd	63	64	64	1
Predicted NSA 3 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							7[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 3 = 7.

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-140	Res.	B	1	170 Hart Ln	69	69	**69**	0
R-141	Res.	B	1	32 Hart Ln	71	71	**72**	1
R-142	Res.	B	1	28 Hart Ln	71	72	**72**	1
R-143	Res.	B	1	22 Hart Ln	71	71	**72**	1
R-144	Res.	B	1	39 Keeneland Dr	65	66	**66**	1
R-145	Res.	B	1	23 Keeneland Dr	64	64	65	1
R-146	Res.	B	1	20 Keeneland Dr	67	68	**69**	2
R-147	Res.	B	1	171 Kingswood Dr	67	67	**68**	1
R-148	Res.	B	1	195 Kingswood Dr	66	67	**68**	2
R-149	Res.	B	1	10 Hart Ln	73	73	**75**	2
R-150	Res.	B	1	223 Kingswood Dr	66	66	**67**	1
R-151	Res.	B	1	192 Kingswood Dr	60	60	62	2
R-152	Res.	B	1	216 Kingswood Dr	62	63	64	2
R-153	Res.	B	1	240 Kingswood Dr	62	63	64	2
R-154	Res.	B	1	262 Kingswood Dr	62	62	64	2
R-155	Res.	B	1	282 Kingswood Dr	62	62	64	2
R-156	Res.	B	1	261 Kingswood Dr	65	66	**67**	2
R-157	Res.	B	1	275 Kingswood Dr	64	64	**66**	2
R-158	Res.	B	1	283 Kingswood Dr	66	66	**68**	2
R-159	Res.	B	1	339 Kingswood Dr	66	66	**68**	2
R-160	Res.	B	1	299 Kingswood Dr	66	66	**68**	2
R-161	Res.	B	1	345 Kingswood Dr	68	68	**70**	2
R-162	Res.	B	1	134 Wendy Ln	57	57	59	2
R-163	Res.	B	1	138 Wendy Ln	62	63	64	2
R-164	Res.	B	1	142 Wendy Ln	72	72	**73**	1
R-165	Res.	B	1	146 Wendy Ln	71	72	**73**	2
R-166	Res.	B	1	150 Wendy Ln	74	74	**76**	2
R-167	Res.	B	1	154 Wendy Ln	76	76	**78**	2
R-168	Res.	B	1	149 Wendy Ln	61	61	63	2
R-169	Res.	B	1	151 Wendy Ln	67	68	**70**	3
R-170	Res.	B	1	153 Wendy Ln	66	66	**69**	3
R-171	Res.	B	1	155 Wendy Ln	63	64	**66**	3
R-172	Res.	B	1	157 Wendy Ln	67	68	**70**	3
R-173	Res.	D	1	132 Shelly Dr	52	53	54	2

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-174	Res.	B	1	142 Shelly Dr	50	52	52	2
R-175	Res.	B	1	144 Shelly Dr	50	52	52	2
R-176	Res.	B	1	160 Wendy Ln	74	75	**77**	3
R-177	Res.	B	1	2026 Howard Gap Rd	65	65	**67**	2
R-178	Res.	B	1	2020 Howard Gap Rd	66	67	**68**	2
R-179	Res.	B	1	335 Carolina Cir	77	77	**78**	1
R-180	Res.	B	1	315 Carolina Cir	71	71	**71**	0
R-181	Res.	B	1	289 Carolina Cir	67	67	**67**	0
R-182	Res.	B	1	257 Carolina Cir	58	59	59	1
R-183	Res.	B	1	251 Carolina Cir	58	58	59	1
R-184	Res.	B	1	223 Carolina Cir	58	58	59	1
R-185	Res.	B	1	205 Carolina Cir	59	60	60	1
R-186	Res.	B	1	185 Carolina Cir	58	59	60	2
R-187	Res.	B	1	165 Carolina Cir	58	59	60	2
R-188	Res.	B	1	145 Carolina Cir	60	61	62	2
R-189	Res.	B	1	125 Carolina Cir	62	63	63	1
R-190	Res.	B	1	113 Carolina Cir	62	63	63	1
R-191	Res.	B	1	93 Carolina Cir	61	62	63	2
R-192	Res.	B	1	73 Carolina Cir	60	61	62	2
R-193	Res.	B	1	55 Carolina Cir	60	61	62	2
R-194	Res.	B	1	35 Carolina Cir	59	60	61	2
R-195	Res.	B	1	512 Brookside Camp Rd	60	62	63	3
R-196	Res.	B	1	270 Carolina Cir	64	65	65	1
R-197	Res.	B	1	254 Carolina Cir	64	64	65	1
R-198	Res.	B	1	226 Carolina Cir	64	65	65	1
R-199	Res.	B	1	212 Carolina Cir	61	61	62	1
R-200	Res.	B	1	192 Carolina Cir	62	63	63	1
R-201	Res.	B	1	172 Carolina Cir	61	62	62	1
R-202	Res.	B	1	152 Carolina Cir	61	61	62	1
R-203	Res.	B	1	132 Carolina Cir	61	62	63	2
R-204	Res.	B	1	112 Carolina Cir	60	61	62	2
R-205	Res.	B	1	100 Carolina Cir	59	60	61	2
R-206	Res.	B	1	74 Carolina Cir	57	58	59	2
R-207	Res.	B	1	60 Carolina Cir	60	61	62	2

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-208	Res.	B	1	42 Carolina Cir	61	62	63	2
R-209	Res.	B	1	322 Carolina Cir	74	74	**75**	1
R-210	Res.	B	1	374 Carolina Cir	74	74	**74**	0
R-211	Res.	B	1	380 Carolina Cir	72	72	**72**	0
R-212	Res.	E	1	210 Carolina Cir	69	69	**68**	-1[5]
R-213	Res.	E	1	426 Carolina Cir	69	69	**69**	0
R-214	Res.	E	1	446 Carolina Cir	67	67	**68**	1
R-215	Res.	B	1	518 Carolina Cir	63	64	65	2
R-216	Res.	B	1	536 Carolina Cir	63	64	65	2
R-217	Res.	B	1	556 Carolina Cir	62	63	64	2
R-218	Res.	B	1	576 Carolina Cir	63	64	**66**	3
R-219	Res.	B	1	464 Carolina Cir	70	70	**71**	1
R-220	Res.	B	1	472 Carolina Cir	75	75	**76**	1
R-221	Res.	B	1	505 Carolina Cir	76	76	**76**	0
R-222	Res.	B	1	537 Carolina Cir	75	76	**76**	1
R-223	Res.	B	1	557 Carolina Cir	74	74	**76**	2
R-224	Res.	B	1	202 Kimberly Ann Dr	74	75	**75**	1
R-225	Res.	B	1	206 Dundeve Cir	74	75	**74**	0
R-226	Res.	B	1	208 Dundeve Cir	74	75	**75**	1
R-227	Res.	B	1	212 Dundeve Cir	74	76	**76**	2
R-228	Res.	B	1	216 Dundeve Cir	73	75	**75**	2
R-229	Res.	B	1	509 Brookside Camp Rd	59	60	61	2
R-230	Res.	B	1	203 Kimberly Ann Dr	62	64	64	2
R-231	Res.	B	1	207 Kimberly Ann Dr	62	64	63	1
R-232	Res.	B	1	211 Kimberly Ann Dr	61	63	63	2
R-233	Res.	B	1	217 Kimberly Ann Dr	60	63	62	2
R-234	Res.	B	1	206 Kimberly Ann Dr	64	66	**66**	2
R-235	Res.	B	1	209 Dundeve Cir	67	69	**68**	1
R-236	Res.	B	1	213 Dundeve Cir	63	65	65	2
R-237	Res.	B	1	237 Dundeve Cir	56	59	58	2
R-238	Res.	B	1	224 Dundeve Cir	69	72	**71**	2
R-239	Res.	B	1	228 Dundeve Cir	65	68	**67**	2
R-240	Res.	B	1	232 Dundeve Cir	61	64	62	1
R-241	Res.	B	1	236 Dundeve Cir	58	62	59	1

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-242	Res.	B	1	201 Sheneman Dr	69	72	**71**	2
R-243	Res.	B	1	213 Sheneman Dr	61	64	63	2
R-244	Res.	B	1	217 Sheneman Dr	58	62	60	2
R-245	Res.	B	1	204 Sheneman Dr	73	76	**74**	1
R-246	Res.	B	1	212 Sheneman Dr	66	70	**68**	2
R-247	Res.	B	1	214 Sheneman Dr	61	66	63	2
R-248	Res.	B	1	300 Whispering Hills Dr	60	65	61	1
R-249	Res.	B	1	312 Whispering Hills Dr	69	73	**71**	2
R-250	Res.	B	1	319 Whispering Hills Dr	62	66	64	2
R-251	Res.	B	1	325 Whispering Hills Dr	62	65	64	2
R-252	Res.	B	1	329 Whispering Hills Dr	62	64	64	2
R-253	Res.	B	1	318 Whispering Hills Dr	69	72	**70**	1
R-254	Res.	B	1	320 Whispering Hills Dr	70	73	**72**	2
R-255	Res.	B	1	324 Whispering Hills Dr	69	71	**71**	2
R-256	Res.	B	1	326 Whispering Hills Dr	65	67	**67**	2
R-257	Res.	B	1	328 Whispering Hills Dr	63	65	65	2
R-258	Res.	B	1	330 Whispering Hills Dr	61	62	63	2
R-259	Res.	B	1	336 Whispering Hills Dr	60	61	62	2
R-260	Res.	B	1	185 Acorn Dr	76	78	**77**	1
R-261	Res.	B	1	120 Acorn Dr	71	72	**72**	1
R-262	Res.	B	1	112 Acorn Dr	66	68	**68**	2
R-263	Res.	B	1	108 Acorn Dr	64	65	65	1
R-264	Res.	B	1	40 Acorn Dr	63	65	65	2
R-265	Res.	B	1	181 Acorn Dr	76	78	**77**	1
R-266	Res.	B	1	119 Acorn Dr	73	75	**74**	1
R-267	Res.	B	1	115 Acorn Dr	71	72	**72**	1
R-268	Res.	B	1	105 W Acorn Dr	68	69	**69**	1
R-269	Res.	B	1	131 W Acorn Dr	71	73	**71**	0
R-270	Res.	B	1	188 W Acorn Dr	67	69	**69**	2
R-271	Res.	B	1	107 Acorn Dr	63	65	65	2
R-272	Res.	B	1	45 Acorn Dr	60	62	61	1
R-273	Res.	B	1	402 Silver Loop Dr	60	62	62	2
R-274	Res.	B	1	294 Pjs Pl	65	65	**66**	1
R-275	Medical Facility	B	1	100 Hospital Dr	78	78	**79**	1

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-276	Res.	B	1	185 Tulip Trl	61	62	63	2
R-277	Res.	B	1	32 Lavender Ln	62	63	64	2
R-278	Res.	B	1	42 Lavender Ln	62	63	64	2
R-279	Res.	B	1	187 Tulip Trl	57	58	59	2
R-280	Res.	B	1	193 Tulip Trl	61	61	62	1
R-281	Res.	B	1	50 Lavender Ln	61	61	62	1
R-282	Res.	B	1	197 Tulip Trl	60	60	61	1
R-283	Res.	B	1	195 Tulip Trl	48	49	50	2
R-284	Res.	B	1	18 Sunset Vista Rd	74	74	**75**	1
R-285	Res.	B	1	46 Sunset Vista Rd	66	66	**67**	1
R-286	Res.	B	1	72 Sunset Vista Rd	65	65	**67**	2
R-287	Res.	B	1	108 Sunset Vista Rd	63	64	65	2
R-288	Res.	B	1	126 Sunset Vista Rd	63	63	64	1
R-289	Res.	B	1	25 Sunset Vista Rd	69	70	**70**	1
R-290	Res.	B	1	91 Sunset Vista Rd	70	70	**72**	2
R-291	Res.	B	1	145 Sunset Vista Rd	68	69	**70**	2
R-292	Res.	B	1	56 Holly Oak Dr	61	61	63	2
R-293	Res.	B	1	67 Holly Oak Dr	59	59	61	2
R-294	Res.	B	1	25 Holly Oak Dr	72	72	**74**	2
R-295	Res.	B	1	104 Twin Springs Rd	69	69	**71**	2
R-296	Res.	B	1	118 Twin Springs Rd	66	66	**68**	2
R-297	Res.	B	1	146 Twin Springs Rd	66	66	**67**	1
R-298	Res.	B	1	141 Twin Springs Rd	74	74	**75**	1
R-299	Res.	B	1	90 Community Rd	62	63	64	2
R-300	Res.	B	1	80 Community Rd	63	64	65	2
R-301	Res.	B	1	68 Community Rd	63	64	65	2
R-302	Res.	B	1	89 Community Rd	63	63	64	1
R-303	Res.	B	1	51 Community Rd	60	61	62	2
R-304	Res.	B	1	61 Community Rd	63	63	64	1
R-305	Res.	B	1	58 Community Rd	60	61	62	2
R-306	Res.	B	1	42 Community Rd	60	60	61	1
R-307	Res.	B	1	49 Community Rd	59	60	61	2
R-308	Res.	B	1	33 Community Rd	56	57	58	2
R-309	Res.	B	1	3 Community Rd	58	59	60	2

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-310	Res.	B	1	5 Community Rd	59	60	61	2
R-311	Res.	B	1	11 Community Rd	58	59	60	2
R-312	Res.	B	1	521 Old Hendersonville Rd	70	70	**70**	0
R-313	Res.	B	1	525 Old Hendersonville Rd	69	70	**70**	1
R-314	Res.	B	1	20 Pleasant Row Dr	66	67	**67**	1
R-315	Res.	B	1	15 Pleasant Row Dr	64	65	**66**	2
R-316	Res.	B	1	45 Pleasant Row Dr	64	65	**66**	2
R-317	Res.	B	1	105 Fender Dr	62	62	63	1
R-318	Res.	B	1	87 Fender Dr	59	60	61	2
R-319	Res.	B	1	80 Fender Dr	60	61	62	2
R-320	Res.	B	1	71 Fender Dr	60	60	61	1
R-321	Res.	B	1	46 Fender Dr	58	59	60	2
R-322	Res.	B	1	526 Old Hendersonville Rd	66	67	**67**	1
R-323	Res.	B	1	522 Old Hendersonville Rd	66	66	**67**	1
R-324	Res.	B	1	19 November Ln	65	66	**66**	1
R-325	Res.	B	1	39 November Ln	64	65	**66**	2
R-326	Res.	B	1	37 November Ln	65	66	**67**	2
R-327	Res.	B	1	65 November Ln	67	68	**70**	3
R-328	Res.	B	1	244 Hickory Flats Dr	69	69	**70**	1
R-329	Res.	B	1	146 Hickory Flats Dr	64	65	65	1
R-330	Res.	B	1	60 November Ln	63	64	65	2
R-331	Res.	B	1	42 November Ln	63	64	64	1
R-332	Res.	B	1	434 Old Hendersonville Rd	62	63	64	2
R-333	Res.	B	1	414 Old Hendersonville Rd	59	60	62	3
R-334	Res.	B	1	372 Old Hendersonville Rd	57	58	60	3
R-335	Res.	B	1	362 Old Hendersonville Rd	57	58	59	2
R-336	Res.	B	1	352 Old Hendersonville Rd	56	57	59	3
R-337	Res.	B	1	211 Hickory Flats Dr	62	63	64	2
R-338	Res.	B	1	97 Hickory Flats Dr	64	65	**66**	2
R-339	Res.	B	1	71 Hickory Flats Dr	64	65	65	1
R-340	Res.	B	1	87 Hickory Flats Dr	62	63	63	1
R-341	Res.	B	1	67 Maxwell Dr	60	61	62	2
R-342	Res.	B	1	53 Maxwell Dr	58	59	60	2
R-343	Res.	B	1	54 Hickory Flats Dr	62	63	64	2

Table B-4: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 4

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-344	Res.	B	1	143 Maxwell Dr	67	68	**69**	2
R-345	Res.	B	1	109 Maxwell Dr	63	65	65	2
R-346	Res.	B	1	70 Maxwell Dr	63	64	65	2
R-347	Res.	B	1	54 Maxwell Dr	62	63	64	2
R-348	Res.	B	1	50 Maxwell Dr	58	59	59	1
R-349	Res.	B	1	48 Maxwell Dr	63	65	65	2
R-350	Res.	B	1	46 Maxwell Dr	66	67	**68**	2
Predicted NSA 4 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							96[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 4 = 96.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-5: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 5

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-351	Res.	B	1	23 Halliburton Rd	63	64	64	1
R-352	Res.	B	1	123 Halliburton Rd	73	73	**77**	4
R-353	Res.	B	1	118 Halliburton Rd	65	65	**66**	1
R-354	Res.	B	1	124 Halliburton Rd	64	64	65	1
R-355	Res.	B	1	54 Dawley Dr	61	61	64	3
R-356	Res.	B	1	46 Dawley Dr	65	65	**67**	2
R-357	Res.	B	1	44 Dawley Dr	61	61	64	3
R-358	Res.	B	1	55 Dawley Dr	57	57	60	3
R-359	Res.	B	1	15 Dawley Dr	65	66	**70**	5
R-360	Res.	B	1	103 Dawley Dr	60	60	62	2
R-361	Res.	B	1	100 Halliburton Rd	62	63	64	2
R-362	Res.	B	1	102 Halliburton Rd	62	63	63	1
R-363	Res.	B	1	104 Halliburton Rd	59	60	60	1
R-364	Res.	B	1	62 Dawley Dr	57	58	58	1
R-365	Res.	B	1	99 Dawley Dr	55	56	57	2
R-366	Res.	B	1	64 Halliburton Rd	63	64	64	1
R-367	Res.	B	1	128 Kennerly Dr	61	62	62	1
R-368	Res.	B	1	110 Kennerly Dr	59	60	60	1
R-369	Res.	B	1	96 Kennerly Dr	58	59	59	1
R-370	Res.	B	1	127 Kennerly Dr	65	66	**66**	1
R-371	Res.	B	1	46 Royal Oaks Dr	65	66	**66**	1
R-372	Res.	B	1	106 Dawley Dr	65	65	**68**	3
R-373	Res.	B	1	76 Dawley Dr	55	55	56	1
R-374	Res.	B	1	120 Dawley Dr	73	73	**77**	4
R-375	Res.	B	1	24 Kennerly Dr	59	60	61	2
R-376	Res.	B	1	6077 Asheville Hwy	59	59	62	3
R-377	Res.	B	1	6075 Asheville Hwy	56	56	58	2
R-378	Res.	D	1	6073 Asheville Hwy	60	61	62	2
R-379	Res.	E	1	46 Hope Opal Ln	74	74	R/W	R/W
R-380	Res.	C	3	38 Hope Opal Ln	75	75	R/W	R/W
R-381	Res.	B	1	34 Hope Opal Ln	74	74	**77**	3
R-382	Res.	B	1	28 Hope Opal Ln	74	74	**77**	3
R-383	Res.	B	1	22 Hope Opal Ln	73	73	**76**	3
R-384	Res.	B	1	14 Hope Opal Ln	72	72	**74**	2

Table B-5: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 5

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-385	Res.	B	1	41 Hope Opal Ln	66	66	**69**	3
R-386	Res.	B	1	65 Hope Opal Ln	65	66	**68**	3
R-387	Res.	B	1	23 Hope Opal Ln	63	63	65	2
R-388	Res.	B	1	73 Hope Opal Ln	65	66	**67**	2
R-389	Res.	B	1	9 Hope Opal Ln	63	64	65	2
R-390	Res.	B	1	120 S Thomas St	69	69	**71**	2
R-391	Res.	B	1	60 Jim Mills Dr	67	67	**69**	2
R-392	Res.	B	1	52 Jim Mills Dr	66	66	**69**	3
R-393	Res.	B	1	36 Jim Mills Dr	65	65	**67**	2
R-394	Res.	B	1	20 Jim Mills Dr	64	64	**66**	2
R-395	Res.	B	1	109 S Thomas St	64	64	**66**	2
R-396	Res.	B	1	112 S Thomas St	64	64	**66**	2
R-397	Res.	B	1	98 S Thomas St	62	63	64	2
R-398	Res.	B	1	41 Lantern Walk Ln	63	63	65	2
R-399	Res.	B	1	42 Lantern Walk Ln	61	62	63	2
R-400	Res.	B	1	33 Jim Mills Dr	61	61	63	2
R-401	Res.	B	1	23 Lantern Walk Ln	63	64	65	2
R-402	Res.	B	1	38 S Thomas St	62	63	63	1
R-403	Res.	B	1	55 Darity Rd	60	61	62	2
R-404	Res.	B	1	75 Darity Rd	60	61	62	2
R-405	Res.	B	1	11 Collins Rd	61	61	62	1
R-406	Res.	B	1	21 Collins Rd	61	62	63	2
R-407	Res.	B	1	51 Collins Rd	61	61	62	1
R-408	Res.	B	1	1212 The Carriage Rd	63	63	65	2
R-409	Res.	E	1	31 Wildwood Cir	57	57	59	2
R-410	Res.	E	1	33 Wildwood Cir	58	59	60	2
R-411	Res.	B	1	35 Wildwood Cir	62	62	64	2
R-412	Res.	B	1	37 Wildwood Cir	66	66	**68**	2
R-413	Res.	E	1	39 Wildwood Cir	69	70	**71**	2
R-414	Res.	B	1	41 Wildwood Cir	73	73	**75**	2
R-415	Res.	B	1	45 Wildwood Cir	73	73	**75**	2
R-416	Res.	B	1	47 Wildwood Cir	73	73	**75**	2
R-417	Res.	C	3	49 Wildwood Cir	73	73	**76**	3
R-418	Res.	B	1	51 Wildwood Cir	74	74	**77**	3

Table B-5: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 5

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-419	Res.	B	1	53 Wildwood Cir	74	74	76	2
R-420	Res.	B	1	55 Wildwood Cir	70	70	74	4
R-421	Res.	B	1	57 Wildwood Cir	64	64	67	3
R-422	Place of Worship	B	1	1291 Fanning Bridge Rd	40	40	42	2
R-423	Res.	B	1	59 Wildwood Cir	62	62	65	3
R-424	Res.	B	1	61 Wildwood Cir	60	60	63	3
R-425	Res.	B	1	63 Wildwood Cir	59	59	62	3
R-426	Res.	B	1	65 Wildwood Cir	59	60	61	2
R-427	Res.	B	1	67 Wildwood Cir	60	61	62	2
R-428	Res.	B	1	32 Wildwood Cir	52	52	54	2
R-429	Res.	B	1	34 Wildwood Cir	55	55	57	2
R-430	Res.	B	1	36 Wildwood Cir	59	59	61	2
R-431	Res.	B	1	38 Wildwood Cir	64	65	67	3
R-432	Res.	B	1	48 Wildwood Cir	64	65	68	4
R-433	Res.	B	1	50 Wildwood Cir	63	63	67	4
R-434	Res.	B	1	52 Wildwood Cir	62	62	66	4
R-435	Res.	B	1	54 Wildwood Cir	59	59	61	2
R-436	Res.	B	1	56 Wildwood Cir	56	56	59	3
R-437	Res.	B	1	58 Wildwood Cir	51	51	53	2
R-438	Res.	B	1	60 Wildwood Cir	54	54	56	2
R-439	Res.	B	1	62 Wildwood Cir	54	55	57	3
R-440	Res.	B	1	64 Wildwood Cir	54	54	57	3
R-441	Res.	B	1	66 Wildwood Cir	56	58	58	2
R-442	Res.	B	1	21 Wildwood Ln	51	51	53	2
R-443	Res.	B	1	20 Wildwood Ln	57	58	60	3
R-444	Res.	B	1	18 Wildwood Ln	52	52	55	3
R-445	Res.	B	1	16 Wildwood Ln	53	53	55	2
R-446	Res.	B	1	14 Wildwood Ln	51	51	53	2
R-447	Res.	B	1	12 Wildwood Ln	49	50	53	4
R-448	Res.	B	1	10 Wildwood Ln	47	47	50	3
R-449	Res.	B	1	8 Wildwood Ln	51	51	54	3
R-450	Res.	B	1	6 Wildwood Ln	54	54	56	2
R-451	Res.	C	2	4 Wildwood Ln	54	55	57	3
R-452	Res.	B	1	25 Norman Rd	57	59	59	2

Table B-5: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 5

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-453	Res.	B	1	27 Norman Rd	56	57	59	3
R-454	Res.	B	1	29 Norman Rd	55	55	58	3
R-455	Res.	B	1	26 Norman Rd	54	55	57	3
R-456	Res.	B	1	92 Underwood Rd	59	60	63	4
R-457	Res.	B	1	5 Piney Dr	58	58	61	3
R-458	Res.	B	1	6 Piney Dr	55	55	58	3
R-459	Res.	B	1	15 Hickory Dr	55	55	57	2
R-460	Res.	B	1	173 Underwood Rd	69	69	72	3
R-461	Hotel - Pool	B	1	183 Underwood Rd	60	60	64	4
R-462	Hotel - Pool	B	1	196 Underwood Rd	52	53	55	3
Predicted NSA 5 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							37[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 5 = 37.

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-463	Hotel - Pool	B	1	550 New Airport Rd	61	61	62	1
R-464	Res.	B	1	1 101 Flycatcher Way	62	62	65	3
R-465	Res.	B	1	1 201 Flycatcher Way	63	63	**66**	3
R-466	Res.	B	1	1 301 Flycatcher Way	64	64	**66**	2
R-467	Res.	B	1	1 102 Flycatcher Way	63	63	**66**	3
R-468	Res.	B	1	1 202 Flycatcher Way	64	64	**67**	3
R-469	Res.	B	1	1 302 Flycatcher Way	65	65	**68**	3
R-470	Res.	B	1	1 103 Flycatcher Way	63	63	**66**	3
R-471	Res.	B	1	1 203 Flycatcher Way	64	64	**67**	3
R-472	Res.	B	1	1 303 Flycatcher Way	65	65	**69**	4
R-473	Res.	B	1	1 106 Flycatcher Way	63	63	**66**	3
R-474	Res.	B	1	1 206 Flycatcher Way	64	64	**67**	3
R-475	Res.	B	1	1 306 Flycatcher Way	65	65	**68**	3
R-476	Res.	B	1	1 107 Flycatcher Way	62	62	65	3
R-477	Res.	B	1	1 207 Flycatcher Way	64	64	**67**	3
R-478	Res.	B	1	1 307 Flycatcher Way	65	65	**68**	3
R-479	Res.	B	1	1 108 Flycatcher Way	53	53	56	3
R-480	Res.	B	1	1 208 Flycatcher Way	57	57	61	4
R-481	Res.	B	1	1 308 Flycatcher Way	60	60	64	4
R-482	Res.	B	1	13 101 Flycatcher Way	51	51	54	3
R-483	Res.	B	1	13 201 Flycatcher Way	53	53	57	4
R-484	Res.	B	1	13 301 Flycatcher Way	55	55	59	4
R-485	Res.	B	1	13 102 Flycatcher Way	57	57	60	3
R-486	Res.	B	1	13 202 Flycatcher Way	61	61	65	4
R-487	Res.	B	1	13 302 Flycatcher Way	63	63	**66**	3
R-488	Res.	B	1	13 103 Flycatcher Way	56	56	60	4
R-489	Res.	B	1	13 203 Flycatcher Way	61	61	64	3
R-490	Res.	B	1	13 303 Flycatcher Way	63	63	**66**	3
R-491	Res.	B	1	13 106 Flycatcher Way	55	55	58	3
R-492	Res.	B	1	13 206 Flycatcher Way	59	59	63	4
R-493	Res.	B	1	13 306 Flycatcher Way	62	62	**66**	4
R-494	Res.	B	1	13 107 Flycatcher Way	53	53	56	3
R-495	Res.	B	1	13 207 Flycatcher Way	58	58	61	3
R-496	Res.	B	1	13 307 Flycatcher Way	61	61	65	4

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-497	Res.	B	1	13 108 Flycatcher Way	54	54	57	3
R-498	Res.	B	1	13 208 Flycatcher Way	55	55	58	3
R-499	Res.	B	1	13 308 Flycatcher Way	58	58	61	3
R-500	Res.	B	1	12 101 Flycatcher Way	55	55	57	2
R-501	Res.	B	1	12 201 Flycatcher Way	55	56	58	3
R-502	Res.	B	1	12 301 Flycatcher Way	56	56	59	3
R-503	Res.	B	1	12 102 Flycatcher Way	54	54	58	4
R-504	Res.	B	1	12 202 Flycatcher Way	59	59	62	3
R-505	Res.	B	1	12 302 Flycatcher Way	62	62	65	3
R-506	Res.	B	1	12 103 Flycatcher Way	56	56	60	4
R-507	Res.	B	1	12 203 Flycatcher Way	61	61	64	3
R-508	Res.	B	1	12 303 Flycatcher Way	63	63	**66**	3
R-509	Res.	B	1	12 106 Flycatcher Way	58	58	61	3
R-510	Res.	B	1	12 206 Flycatcher Way	62	62	65	3
R-511	Res.	B	1	12 306 Flycatcher Way	64	64	**67**	3
R-512	Res.	B	1	12 107 Flycatcher Way	59	59	62	3
R-513	Res.	B	1	12 207 Flycatcher Way	62	62	**66**	4
R-514	Res.	B	1	12 307 Flycatcher Way	64	64	**67**	3
R-515	Res.	B	1	12 108 Flycatcher Way	55	55	58	3
R-516	Res.	B	1	12 208 Flycatcher Way	59	59	62	3
R-517	Res.	B	1	12 308 Flycatcher Way	62	62	65	3
R-518	Res.	B	1	11 101 Flycatcher Way	55	55	59	4
R-519	Res.	B	1	11 201 Flycatcher Way	60	60	63	3
R-520	Res.	B	1	11 301 Flycatcher Way	62	62	65	3
R-521	Res.	B	1	11 102 Flycatcher Way	61	61	64	3
R-522	Res.	B	1	11 202 Flycatcher Way	64	64	**67**	3
R-523	Res.	B	1	11 302 Flycatcher Way	65	65	**68**	3
R-524	Res.	B	1	11 103 Flycatcher Way	60	60	64	4
R-525	Res.	C	5	11 203 Flycatcher Way	63	63	**66**	3
R-526	Res.	B	1	11 303 Flycatcher Way	64	64	**67**	3
R-527	Res.	B	1	11 106 Flycatcher Way	60	60	63	3
R-528	Res.	B	1	11 206 Flycatcher Way	63	63	**66**	3
R-529	Res.	B	1	11 306 Flycatcher Way	64	64	**67**	3
R-530	Res.	B	1	11 107 Flycatcher Way	59	59	63	4

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-531	Res.	B	1	11 207 Flycatcher Way	62	62	65	3
R-532	Res.	B	1	11 307 Flycatcher Way	63	63	66	3
R-533	Res.	B	1	11 108 Flycatcher Way	52	52	55	3
R-534	Res.	B	1	11 208 Flycatcher Way	52	52	55	3
R-535	Res.	D	1	11 308 Flycatcher Way	53	53	57	4
R-536	Res.	B	1	10 101 Flycatcher Way	53	53	56	3
R-537	Res.	B	1	10 201 Flycatcher Way	55	56	59	4
R-538	Res.	B	1	10 301 Flycatcher Way	57	57	61	4
R-539	Res.	B	1	10 102 Flycatcher Way	60	60	64	4
R-540	Res.	B	1	10 202 Flycatcher Way	63	63	66	3
R-541	Res.	B	1	10 302 Flycatcher Way	64	64	67	3
R-542	Res.	B	1	10 103 Flycatcher Way	61	61	64	3
R-543	Res.	B	1	10 203 Flycatcher Way	63	63	66	3
R-544	Res.	B	1	10 303 Flycatcher Way	64	64	67	3
R-545	Res.	B	1	10 106 Flycatcher Way	62	62	65	3
R-546	Res.	B	1	10 206 Flycatcher Way	63	63	67	4
R-547	Res.	B	1	10 306 Flycatcher Way	64	64	67	3
R-548	Res.	B	1	10 107 Flycatcher Way	62	62	65	3
R-549	Res.	B	1	10 207 Flycatcher Way	63	63	67	4
R-550	Res.	B	1	10 307 Flycatcher Way	64	64	67	3
R-551	Res.	B	1	10 108 Flycatcher Way	59	59	63	4
R-552	Res.	B	1	10 208 Flycatcher Way	61	61	64	3
R-553	Res.	B	1	10 308 Flycatcher Way	61	62	64	3
R-554	Res.	B	1	9 104 Flycatcher Way	52	52	55	3
R-555	Res.	B	1	9 204 Flycatcher Way	54	54	57	3
R-556	Res.	B	1	9 304 Flycatcher Way	55	55	59	4
R-557	Res.	B	1	9 101 Flycatcher Way	61	61	64	3
R-558	Res.	B	1	9 201 Flycatcher Way	62	62	65	3
R-559	Res.	B	1	9 301 Flycatcher Way	63	63	66	3
R-560	Res.	B	1	9 102 Flycatcher Way	62	62	65	3
R-561	Res.	B	1	9 202 Flycatcher Way	63	63	66	3
R-562	Res.	B	1	9 302 Flycatcher Way	64	64	67	3
R-563	Res.	C	1	9 103 Flycatcher Way	61	61	64	3
R-564	Res.	B	1	9 203 Flycatcher Way	62	62	65	3

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-565	Res.	B	1	9 303 Flycatcher Way	63	63	**66**	3
R-566	Res.	B	1	9 106 Flycatcher Way	60	60	63	3
R-567	Res.	B	1	9 206 Flycatcher Way	61	61	65	4
R-568	Res.	B	1	9 306 Flycatcher Way	62	62	65	3
R-569	Res.	B	1	9 107 Flycatcher Way	59	59	63	4
R-570	Res.	B	1	9 207 Flycatcher Way	61	61	64	3
R-571	Res.	B	1	9 307 Flycatcher Way	62	62	65	3
R-572	Res.	B	1	428 Rockwood Rd	64	64	**68**	4
R-573	Res.	B	1	26 Foxberry Dr	61	61	63	2
R-574	Res.	B	1	24 Foxberry Dr	62	63	65	3
R-575	Res.	B	1	22 Foxberry Dr	65	65	**68**	3
R-576	Res.	B	1	18 Foxberry Dr	67	67	**69**	2
R-577	Res.	B	1	16 Foxberry Dr	68	68	**70**	2
R-578	Res.	B	1	14 Foxberry Dr	69	69	**72**	3
R-579	Res.	B	1	10 Foxberry Dr	72	72	**75**	3
R-580	Res.	B	1	8 Foxberry Dr	73	73	**76**	3
R-581	Res.	B	1	4 Foxberry Dr	73	73	**76**	3
R-582	Res.	B	1	27 Foxberry Dr	54	55	58	4
R-583	Res.	B	1	25 Foxberry Dr	59	59	62	3
R-584	Res.	B	1	19 Foxberry Dr	55	55	58	3
R-585	Res.	B	1	15 Foxberry Dr	65	65	**68**	3
R-586	Res.	B	1	9 Foxberry Dr	66	66	**70**	4
R-587	Res.	B	1	7 Foxberry Dr	67	67	**71**	4
R-588	Res.	B	1	5 Foxberry Dr	67	67	**71**	4
R-589	Res.	B	1	3 Foxberry Dr	67	67	**70**	3
R-590	Res.	B	1	54 Winding Oak Dr	54	54	57	3
R-591	Res.	B	1	58 Winding Oak Dr	57	57	60	3
R-592	Res.	B	1	62 Winding Oak Dr	60	60	63	3
R-593	Res.	B	1	66 Winding Oak Dr	64	64	**67**	3
R-594	Res.	B	1	63 Winding Oak Dr	62	62	65	3
R-595	Res.	B	1	57 Winding Oak Dr	59	59	63	4
R-596	Res.	B	1	53 Winding Oak Dr	54	54	58	4
R-597	Res.	B	1	47 Winding Oak Dr	54	54	58	4
R-598	Res.	B	1	37 Winding Oak Dr	55	55	59	4

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-599	Res.	B	1	31 Winding Oak Dr	57	57	60	3
R-600	Res.	B	1	27 Winding Oak Dr	58	58	61	3
R-601	Res.	B	1	102 Wood Glen Ct	57	57	60	3
R-602	Res.	B	1	106 Wood Glen Ct	59	59	63	4
R-603	Res.	B	1	110 Wood Glen Ct	58	58	61	3
R-604	Res.	B	1	114 Wood Glen Ct	63	63	**67**	4
R-605	Res.	B	1	118 Wood Glen Ct	71	71	**74**	3
R-606	Res.	B	1	109 Wood Glen Ct	70	70	**74**	4
R-607	Res.	B	1	105 Wood Glen Ct	64	64	**67**	3
R-608	Res.	B	1	15 Winding Oak Dr	63	63	**66**	3
R-609	Res.	C	1	9 Winding Oak Dr	63	63	**66**	3
R-610	Res.	C	1	5 Winding Oak Dr	62	62	**66**	4
R-611	Res.	B	1	1 Winding Oak Dr	64	64	**67**	3
R-612	Res.	B	1	169 New Rockwood Rd	65	65	**69**	4
R-613	Res.	B	1	173 New Rockwood Rd	69	69	**73**	4
R-614	Res.	B	1	177 New Rockwood Rd	73	73	**76**	3
R-615	Res.	B	1	168 New Rockwood Rd	69	69	**74**	5
R-616	Res.	B	1	167 New Rockwood Rd	66	66	**69**	3
R-617	Res.	B	1	22 Winding Oak Dr	58	58	61	3
R-618	Res.	B	1	18 Winding Oak Dr	60	60	64	4
R-619	Res.	B	1	14 Winding Oak Dr	58	58	61	3
R-620	Res.	B	1	10 Winding Oak Dr	58	58	61	3
R-621	Res.	B	1	6 Winding Oak Dr	58	58	61	3
R-622	Res.	B	1	2 Winding Oak Dr	60	60	64	4
R-623	Res.	B	1	151 New Rockwood Rd	55	55	58	3
R-624	Res.	B	1	150 New Rockwood Rd	55	55	58	3
R-625	Res.	B	1	74 Aberdeen Dr	58	58	61	3
R-626	Res.	B	1	315 Long Shoals Rd	70	70	**73**	3
R-627	Medical Facility	B	1	15 Skyland Inn Dr	40	40	40	0

Table B-6: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 6

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
Predicted NSA 6 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							67[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 6 = 67.

Table B-7: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 7

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-628	Hotel - Restaurant	B	1	43 Town Square Blvd	63	63	66	3
R-629	Trail	B	1	Mountains-To-Sea Trail (East)	68	69	**73**	5
R-630	Res.	B	1	215 Ferry Rd	64	64	**66**	2
R-631	Res.	B	1	218 Ferry Rd	63	63	65	2
R-632	Res.	B	1	200 Ferry Rd	68	68	**70**	2
R-633	Res.	B	1	192 Ferry Rd	68	68	**70**	2
R-634	Res.	B	1	759 Brevard Rd	69	72	**73**	4
R-635	Res.	B	1	757 Old Brevard Rd	59	60	62	3
R-636	Res.	B	1	8 Pine Ln	63	64	R/W	R/W
R-637	Res.	B	1	10 Pine Ln	60	61	R/W	R/W
R-638	Res.	B	1	12 Pine Ln	63	64	R/W	R/W
R-639	Res.	B	1	20 Pine Ln	65	66	R/W	R/W
R-640	Res.	B	1	24 Pine Ln	66	66	**68**	2
R-641	Res.	B	1	26 Pine Ln	67	67	**67**	0
R-642	Res.	B	1	28 Pine Ln	68	68	**66**	-2[5]
R-643	Res.	B	1	50 Pine Ln	69	69	R/W	R/W
R-644	Res.	B	1	40 Pine Ln	69	69	**69**	0
R-645	Res.	B	1	36 Pine Ln	70	70	**71**	1
R-646	Res.	B	1	29 Pine Ln	68	68	**68**	0
R-647	Res.	B	1	27 Pine Ln	65	65	**67**	2
R-648	Res.	B	1	23 Pine Ln	63	63	64	1
R-649	Res.	B	1	19 Pine Ln	61	61	63	2
R-650	Res.	B	1	17 Pine Ln	60	60	62	2
R-651	Res.	B	1	15 Pine Ln	61	61	65	4
R-652	Res.	B	1	13 Pine Ln	58	59	61	3
R-653	Res.	B	1	751 Brevard Rd	58	58	61	3
R-654	Res.	B	1	751 Old Brevard Rd	66	66	**68**	2
R-655	Res.	B	1	36 Dogwood Rd	65	65	**68**	3
R-656	Res.	B	1	50 Dogwood Rd	68	68	**71**	3

Table B-7: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 7

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
Predicted NSA 7 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							15[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 7 = 15.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-8: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 8

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-657	Res.	B	1	33 Rocky Ridge Rd	62	62	63	1
R-658	Hotel - Restaurant	B	1	1 Rocky Ridge Rd - Hampton Inn	62	62	64	2
R-659	Hotel - Pool	B	1	1 Wedgefield Dr	64	65	65	1
R-660	Res.	B	1	13 Wedgefield Dr	51	52	53	2
R-661	Res.	B	1	20 Wedgefield Dr	56	57	57	1
R-662	Hotel - Pool	B	1	845 Brevard Rd	52	53	52	0
R-663	Res.	B	1	184 Ferry Rd	67	67	**69**	2
R-664	Res.	B	1	191 Ferry Rd	73	73	**75**	2
R-665	Res.	B	1	185 Ferry Rd	61	61	65	4
R-666	Trail	B	1	Mountains-To-Sea Trail (West)	71	71	**75**	4
Predicted NSA 8 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							3[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 8 = 3.

Table B-9: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 9

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-667	Res.	B	1	40 Bear Leah Trl	75	75	**77**	2
R-668	Res.	B	1	38 Bear Leah Trl	75	75	**78**	3
R-669	Res.	B	1	36 Bear Leah Trl	71	71	**73**	2
R-670	Res.	B	1	16 Bear Leah Trl	70	70	**67**	-3[5]
R-671	Res.	B	1	404 Glenn Bridge Rd	69	69	**71**	2
R-672	Res.	B	1	406 Glenn Bridge Rd	66	67	**68**	2
R-673	Res.	B	1	1 Hidden Creek Dr	68	68	**70**	2
R-674	Res.	B	1	3 Hidden Creek Dr	66	66	**68**	2
R-675	Res.	B	1	5 Hidden Creek Dr	67	67	**69**	2
R-676	Res.	B	1	7 Hidden Creek Dr	66	66	**68**	2
R-677	Res.	B	1	20 Hidden Creek Dr	64	64	**67**	3
R-678	Res.	B	1	12 Wells Dr	65	65	**67**	2
R-679	Res.	B	1	10 Hidden Creek Dr	67	67	**69**	2
R-680	Res.	C	1	13 Hidden Creek Dr	66	66	**68**	2
R-681	Res.	B	1	2 Hidden Creek Dr	66	66	**69**	3
R-682	Res.	B	1	1 Nathan Dr	65	65	**68**	3
R-683	Res.	B	1	5 Nathan Dr	65	65	**68**	3
R-684	Res.	B	1	105 Hidden Creek Rd	75	75	**78**	3
R-685	Res.	B	1	8 Nathan Dr	68	68	**70**	2
R-686	Res.	B	1	7 Nathan Dr	65	65	**67**	2
R-687	Res.	B	1	15 Nathan Dr	62	62	65	3
R-688	Res.	B	1	14 Wells Dr	65	65	**68**	3
R-689	Res.	B	1	9 Wells Dr	66	66	**69**	3
R-690	Res.	B	1	15 Wells Dr	66	66	**68**	2
R-691	Res.	B	1	17 Wells Dr	65	65	**68**	3
R-692	Res.	B	1	15 Hidden Creek Dr	65	65	**67**	2
R-693	Res.	B	1	17 Hidden Creek Dr	63	63	65	2
R-694	Res.	B	1	101 Hidden Creek Rd	68	68	**72**	4
R-695	Res.	B	1	10 Nathan Dr	64	64	**67**	3
R-696	Res.	B	1	12 Nathan Dr	60	60	63	3
R-697	Res.	C	1	14 Nathan Dr	62	62	65	3
R-698	Res.	B	1	16 Nathan Dr	64	64	**67**	3
R-699	Res.	B	1	18 Hidden Creek Dr	64	64	**66**	2

Table B-9: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 9

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
Predicted NSA 9 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							29[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 9 = 29.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-10: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 10

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-700	Golf Course	B	1	101 French Broad Ln - Golf Course	72	72	**73**	1
R-701	Res.	B	1	98 Vaughn Cir	71	71	**73**	2
R-702	Res.	B	1	91 Vaughn Cir	65	65	**67**	2
R-703	Res.	B	1	289 Butler Bridge Rd	63	63	64	1
R-704	Res.	B	1	247 Butler Bridge Rd	63	63	64	1
R-705	Res.	B	1	65 Dry Hollow Ln	58	58	58	0
R-706	Res.	B	1	2933 N Rugby Rd	58	58	61	3
R-707	Res.	B	1	2911 N Rugby Rd	57	57	60	3
R-708	Res.	B	1	34 Dry Hollow Ln	59	59	61	2
R-709	Res.	B	1	38 Dry Hollow Ln	59	59	61	2
R-710	Res.	B	1	34 Jade Dr	59	59	61	2
R-711	Res.	B	1	26 Jade Dr	57	58	59	2
R-712	Res.	B	1	24 Jade Dr	58	58	60	2
R-713	Res.	B	1	16 Jade Dr	58	58	60	2
R-714	Res.	B	1	14 Jade Dr	58	58	60	2
Predicted NSA 10 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							3[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 10 = 3.

Table B-11: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 11

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-715	Res.	B	1	41 Bicknell Dr	59	60	62	3
R-716	Res.	B	1	68 C Ln	48	49	52	4
R-717	Res.	B	1	71 C Ln	47	48	51	4
R-718	Res.	B	1	65 C Ln	49	50	51	2
R-719	Res.	B	1	48 Cuerton Pl	65	66	**67**	2
R-720	Res.	B	1	26 Bicknell Dr	63	64	64	1
R-721	Res.	B	1	56 Cuerton Pl	62	63	64	2
R-722	Res.	B	1	72 Cuerton Pl	60	61	61	1
R-723	Res.	B	1	76 Cuerton Pl	62	63	63	1
R-724	Res.	B	1	78 Cuerton Pl	60	61	61	1
R-725	Res.	B	1	53 Cuerton Pl	64	66	**66**	2
R-726	Res.	B	1	51 Cuerton Pl	64	66	**66**	2
R-727	Res.	B	1	63 Cuerton Pl	62	64	64	2
R-728	Res.	B	1	61 Cuerton Pl	63	64	64	1
R-729	Res.	B	1	57 Cuerton Pl	63	65	65	2
R-730	Res.	B	1	59 Cuerton Pl	63	64	64	1
R-731	Res.	B	1	73 Cuerton Pl	61	63	63	2
R-732	Res.	B	1	71 Cuerton Pl	63	64	65	2
R-733	Res.	B	1	75 Cuerton Pl	63	64	65	2
R-734	Res.	B	1	77 Cuerton Pl	62	63	63	1
R-735	Res.	B	1	39 Cuerton Pl	67	69	**68**	1
R-736	Res.	B	1	34 Alverson Ln	57	59	59	2
R-737	Res.	B	1	38 Alverson Ln	58	60	60	2
R-738	Res.	B	1	48 Alverson Ln	58	60	60	2
R-739	Res.	B	1	62 Alverson Ln	58	59	60	2
R-740	Res.	B	1	74 Alverson Ln	57	59	59	2
R-741	Res.	B	1	31 Cuerton Pl	65	67	**67**	2
R-742	Res.	B	1	30 Alverson Ln	57	59	59	2
R-743	Res.	C	5	24 Alverson Ln	60	62	63	3
R-744	Res.	B	1	16 Alverson Dr	64	66	**66**	2
R-745	Res.	B	1	53 Alverson Ln	65	67	**67**	2
R-746	Res.	B	1	13 Cuerton Pl	65	67	**67**	2
R-747	Res.	B	1	75 Cuerton Pl	59	60	61	2
R-748	Res.	B	1	399 Naples Rd	65	66	**66**	1

Table B-11: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 11

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-749	Res.	B	1	73 Pack Rd	58	59	59	1
R-750	Res.	B	1	83 Naples Glenn Trl	71	71	**72**	1
R-751	Res.	B	1	168 S Naples Rd	57	58	59	2
R-752	Res.	B	1	288 Old Naples Rd	66	67	**67**	1
R-753	Res.	B	1	284 Old Naples Rd	67	68	**68**	1
R-754	Res.	B	1	15 Canterbury Way	78	78	**79**	1
R-755	Res.	B	1	41 Canterbury Way	70	70	**71**	1
R-756	Res.	B	1	118 Canterbury Way	70	70	**71**	1
R-757	Res.	B	1	121 Canterbury Hill Ln	71	71	**72**	1
R-758	Res.	B	1	304 Canterbury Way	67	67	**69**	2
R-759	Res.	B	1	328 Canterbury Way	65	65	**66**	1
R-760	Res.	B	1	44 Canterbury Hill Ln	72	72	**72**	0
R-761	Res.	B	1	238 Canterbury Way	69	69	**70**	1
R-762	Res.	B	1	299 Canterbury Way	67	67	**68**	1
R-763	Res.	B	1	275 Canterbury Way	61	61	62	1
R-764	Res.	B	1	269 Canterbury Way	63	63	64	1
R-765	Res.	B	1	181 Canterbury Way	60	60	61	1
R-766	Res.	B	1	255 Canterbury Way	66	66	**67**	1
R-767	Res.	B	1	80 Oak Meadow Ln	68	68	**68**	0
R-768	Res.	B	1	73 Oak Meadow Ln	66	66	**68**	2
R-769	Res.	B	1	17 Sujo Trl	68	69	**69**	1
R-770	Res.	B	1	14 Sujo Trl	64	64	65	1
R-771	Res.	B	1	157 Oak Meadow Ln	58	58	59	1
R-772	Res.	B	1	40 Sujo Trl	66	66	**67**	1
R-773	Res.	B	1	281 High Hills Rd	64	65	**66**	2
R-774	Recreation Area	B	1	485 Brookside Camp Rd	73	73	**74**	1
Predicted NSA 11 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							28[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 11 = 28.

Table B-12: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 12

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-775	Res.	B	1	672 Hyder Farm Rd	60	60	62	2
R-776	Res.	B	1	679 Hyder Farm Rd	56	56	58	2
R-777	Res.	B	1	619 Hyder Farm Rd	74	75	**75**	1
R-778	Res.	B	1	104 Alex Cove Dr	71	71	**70**	-1[5]
R-779	Res.	B	1	507 Hyder Farm Rd	69	69	**70**	1
R-780	Res.	B	1	110 Alex Cove Dr	61	61	62	1
R-781	Res.	B	1	114 Alex Cove Dr	58	58	59	1
R-782	Res.	B	1	307 Hyder Farm Rd	64	65	65	1
R-783	Res.	B	1	825 Clear Creek Rd	62	62	63	1
R-784	Medical Facility	B	1	703 Carolina Village Rd	40	40	41	1
R-785	Res.	B	1	1118 Carolina Village Rd	61	61	62	1
R-786	Res.	B	1	1106 Carolina Village Rd	59	60	61	2
R-787	Res.	B	1	1102 Carolina Village Rd	48	48	50	2
R-788	Res.	B	1	1084 Carolina Village Rd	54	54	56	2
R-789	Res.	B	1	1076 Carolina Village Rd	56	56	58	2
R-790	Res.	B	1	1072 Carolina Village Rd	56	56	57	1
R-791	Res.	B	1	1133 Carolina Village Rd	61	61	63	2
R-792	Res.	B	1	1129 Carolina Village Rd	60	61	61	1
R-793	Res.	B	1	1117 Carolina Village Rd	42	42	44	2
R-794	Res.	B	1	1107 Carolina Village Rd	60	60	61	1
R-795	Res.	B	1	1099 Carolina Village Rd	57	57	58	1
R-796	Res.	B	1	1089 Carolina Village Rd	43	44	46	3
R-797	Res.	B	1	1065 Carolina Village Rd	53	53	55	2
R-798	Res.	B	1	1055 Carolina Village Rd	51	51	53	2
R-799	Res.	B	1	1047 Carolina Village Rd	45	45	48	3
R-800	Res.	B	1	1035 Carolina Village Rd	54	55	56	2
R-801	Res.	B	1	1027 Carolina Village Rd	55	55	56	1
R-802	Res.	B	1	1021 Carolina Village Rd	46	46	48	2
R-803	Res.	B	1	1052 Carolina Village Rd	58	58	59	1
R-804	Res.	B	1	1040 Carolina Village Rd	49	49	51	2
R-805	Res.	B	1	1036 Carolina Village Rd	49	49	50	1
R-806	Res.	B	1	834 Carolina Village Rd	45	45	47	2
R-807	Res.	B	1	838 Carolina Village Rd	59	60	60	1
R-808	Res.	B	1	832 Carolina Village Rd	61	61	62	1

Table B-12: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 12

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-809	Res.	B	1	992 Carolina Village Rd	50	50	51	1
R-810	Res.	B	1	988 Carolina Village Rd	54	54	55	1
R-811	Res.	B	1	984 Carolina Village Rd	55	55	56	1
R-812	Recreation Area	B	1	600 Carolina Village Rd	61	61	63	2
R-813	Res.	B	1	10 Tanager Trail	56	56	57	1
R-814	Res.	B	1	14 Tanager Trail	52	52	54	2
R-815	Res.	B	1	12 Tanager Trail	49	49	51	2
R-816	Res.	B	1	24 White Quail Trail	56	56	57	1
R-817	Res.	B	1	22 White Quail Trail	60	60	62	2
R-818	Res.	B	1	20 White Quail Trail	58	59	61	3
R-819	Res.	B	1	21 White Quail Trail	61	61	63	2
R-820	Res.	B	1	23 White Quail Trail	58	59	60	2
R-821	Res.	B	1	25 White Quail Trail	50	51	53	3
R-822	Res.	B	1	418 Carolina Village Rd	74	75	**76**	2
R-823	Res.	B	1	30 Lake Spur Dr	52	52	54	2
R-824	Res.	B	1	34 Lake Spur Dr	51	52	54	3
R-825	Res.	B	1	32 Lake Spur Dr	50	50	52	2
R-826	Res.	B	1	38 Lake Spur Dr	55	55	57	2
R-827	Res.	B	1	36 Lake Spur Dr	58	59	60	2
R-828	Res.	B	1	40 Lake Spur Dr	54	54	55	1
R-829	Res.	B	1	35 Lake Spur Dr	62	63	64	2
R-830	Res.	B	1	37 Lake Spur Dr	67	68	**69**	2
R-831	Res.	B	1	39 Lake Spur Dr	67	68	**69**	2
R-832	Res.	B	1	348 Carolina Village Rd	75	76	**76**	1
R-833	Res.	B	1	346 Carolina Village Rd	72	72	**73**	1
R-834	Res.	B	1	108-A Lake Club Cir	53	54	55	2
R-835	Res.	B	1	108-B Lake Club Cir	54	55	56	2
R-836	Res.	B	1	108-C Lake Club Cir	54	55	56	2
R-837	Res.	B	1	108-D Lake Club Cir	55	55	56	1
R-838	Res.	B	1	108-E Lake Club Cir	55	56	57	2
R-839	Res.	B	1	108-F Lake Club Cir	56	57	58	2
R-840	Res.	B	1	103-F Lake Club Cir	48	49	50	2
R-841	Res.	B	1	103-E Lake Club Cir	48	48	50	2
R-842	Res.	B	1	103-D Lake Club Cir	48	49	50	2

Table B-12: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 12

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-843	Res.	B	1	103-C Lake Club Cir	48	49	50	2
R-844	Res.	B	1	103-B Lake Club Cir	48	49	50	2
R-845	Res.	B	1	103-A Lake Club Cir	51	52	53	2
R-846	Res.	B	1	45-D Lake Club Cir	52	53	54	2
R-847	Res.	B	1	45-C Lake Club Cir	52	52	54	2
R-848	Res.	B	1	45-B Lake Club Cir	52	52	54	2
R-849	Res.	B	1	45-A Lake Club Cir	51	52	53	2
R-850	Res.	B	1	62-A Lake Club Cir	55	56	57	2
R-851	Res.	B	1	62-B Lake Club Cir	53	54	54	1
R-852	Res.	B	1	62-C Lake Club Cir	53	54	54	1
R-853	Res.	B	1	62-D Lake Club Cir	53	54	55	2
R-854	Res.	B	1	30-A Lake Club Cir	54	54	55	1
R-855	Res.	B	1	30-B Lake Club Cir	54	55	55	1
R-856	Res.	B	1	30-C Lake Club Cir	54	55	55	1
R-857	Res.	B	1	30-D Lake Club Cir	55	55	56	1
Predicted NSA 12 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							8[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 12 = 8.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-13: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 13

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-858	Camp-grounds	B	1	300 Orrs Camp Rd	56	56	58	2
R-859	Camp-grounds	B	1	300 Orrs Camp Rd 2	60	60	61	1
R-860	Res.	B	1	305 Prince Rd	73	73	**74**	1
R-861	Res.	B	1	77 Fairbanks Ln	72	72	**73**	1
R-862	Res.	B	1	69 Fairbanks Ln	65	65	**66**	1
R-863	Res.	B	1	47 Fairbanks Ln	61	62	63	2
R-864	Res.	B	1	317 W Prince Rd	59	59	61	2
R-865	Res.	B	1	311 W Prince Rd	61	61	63	2
R-866	Res.	B	1	301 W Prince Rd	61	62	62	1
R-867	Res.	B	1	323 W Prince Rd	65	65	**66**	1
R-868	Res.	B	1	325 W Prince Rd	76	76	**74**	-2[5]
R-869	Res.	B	1	337 W Prince Rd	74	74	**74**	0
R-870	Res.	B	1	333 W Prince Rd	72	73	**73**	1
R-871	Res.	B	1	324 W Prince Rd	56	56	58	2
R-872	Res.	B	1	330 W Prince Rd	62	62	64	2
R-873	Res.	B	1	334 W Prince Rd	57	58	59	2
R-874	Res.	B	1	398 W Prince Rd	57	57	59	2
R-875	Res.	B	1	341 W Prince Rd	69	70	**70**	1
R-876	Res.	B	1	365 W Prince Rd	67	68	**68**	1
R-877	Res.	B	1	373 W Prince Rd	64	64	65	1
R-878	Res.	B	1	381 W Prince Rd	63	63	64	1
R-879	Res.	B	1	655 Dana Rd	61	61	62	1
R-880	Res.	B	1	665 Dana Rd	77	77	**79**	2
R-881	Res.	B	1	102 Papa Joes Way	62	63	64	2
R-882	Res.	B	1	104 Papa Joes Way	60	60	62	2
R-883	Res.	B	1	101 Papa Joes Way	65	66	**68**	3
R-884	Res.	B	1	2 Meadowlark Ln	68	69	**70**	2
R-885	Res.	B	1	4 Meadowlark Ln	66	67	**68**	2
R-886	Res.	B	1	6 Meadowlark Ln	65	65	**67**	2
R-887	Res.	B	1	8 Meadowlark Ln	63	64	65	2
R-888	Res.	B	1	10 Meadowlark Ln	62	63	65	3
R-889	Res.	B	1	12 Meadowlark Ln	62	62	63	1
R-890	Res.	D	1	14 Meadowlark Ln	62	63	63	1
R-891	Res.	B	1	18 Meadowlark Ln	59	59	61	2

Table B-13: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 13

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-892	Res.	B	1	20 Meadowlark Ln	59	59	61	2
R-893	Res.	B	1	24 Meadowlark Ln	58	59	60	2
R-894	Res.	B	1	26 Meadowlark Ln	59	59	61	2
R-895	Res.	B	1	28 Meadowlark Ln	58	59	60	2
R-896	Res.	B	1	30 Meadowlark Ln	58	58	60	2
R-897	Res.	B	1	32 Meadowlark Ln	57	57	59	2
R-898	Res.	B	1	3 Meadowlark Ln	71	71	**73**	2
R-899	Res.	B	1	5 Meadowlark Ln	70	70	**72**	2
R-900	Res.	B	1	9 Meadowlark Ln	66	67	**68**	2
R-901	Res.	B	1	11 Meadowlark Ln	65	66	**68**	3
R-902	Res.	B	1	13 Meadowlark Ln	64	64	**66**	2
R-903	Res.	B	1	15 Meadowlark Ln	63	64	65	2
R-904	Res.	B	1	17 Meadowlark Ln	63	63	65	2
R-905	Res.	B	1	19 Meadowlark Ln	62	63	64	2
R-906	Res.	B	1	21 Meadowlark Ln	62	62	64	2
R-907	Res.	B	1	23 Meadowlark Ln	62	62	64	2
R-908	Res.	B	1	27 Meadowlark Ln	62	63	64	2
R-909	Res.	B	1	29 Meadowlark Ln	62	62	64	2
R-910	Res.	B	1	33 Meadowlark Ln	61	61	63	2
R-911	Res.	B	1	35 Meadowlark Ln	60	60	62	2
R-912	Res.	B	1	37 Meadowlark Ln	61	61	62	1
R-913	Res.	B	1	41 Meadowlark Ln	59	59	61	2
R-914	Res.	B	1	39 Meadowlark Ln	75	75	**74**	-1[5]
R-915	Res.	B	1	40 Meadowlark Ln	65	65	**66**	1
R-916	Res.	B	1	51 Orchard Park Rd	62	63	64	2
R-917	Res.	B	1	64 Orchard Park Rd	65	65	**66**	1
R-918	Res.	B	1	69 Orchard Park Rd	64	64	65	1
R-919	Res.	B	1	72 Orchard Park Rd	66	67	**67**	1
R-920	Res.	B	1	121 Friendship Ln	68	69	**69**	1
R-921	Res.	B	1	111 Friendship Ln	66	67	**68**	2
R-922	Res.	B	1	125 Friendship Ln	65	65	**66**	1
R-923	Res.	B	1	16 Town View Ct	62	63	64	2
R-924	Res.	B	1	701 Tracy Grove Rd	71	71	**72**	1
R-925	Res.	B	1	703 Tracy Grove Rd	67	67	**68**	1

Table B-13: Noise Sensitive Receptors and Hourly Equivalent Noise Levels Hybrid 6/8-Lane Widening Alternative – NSA 13

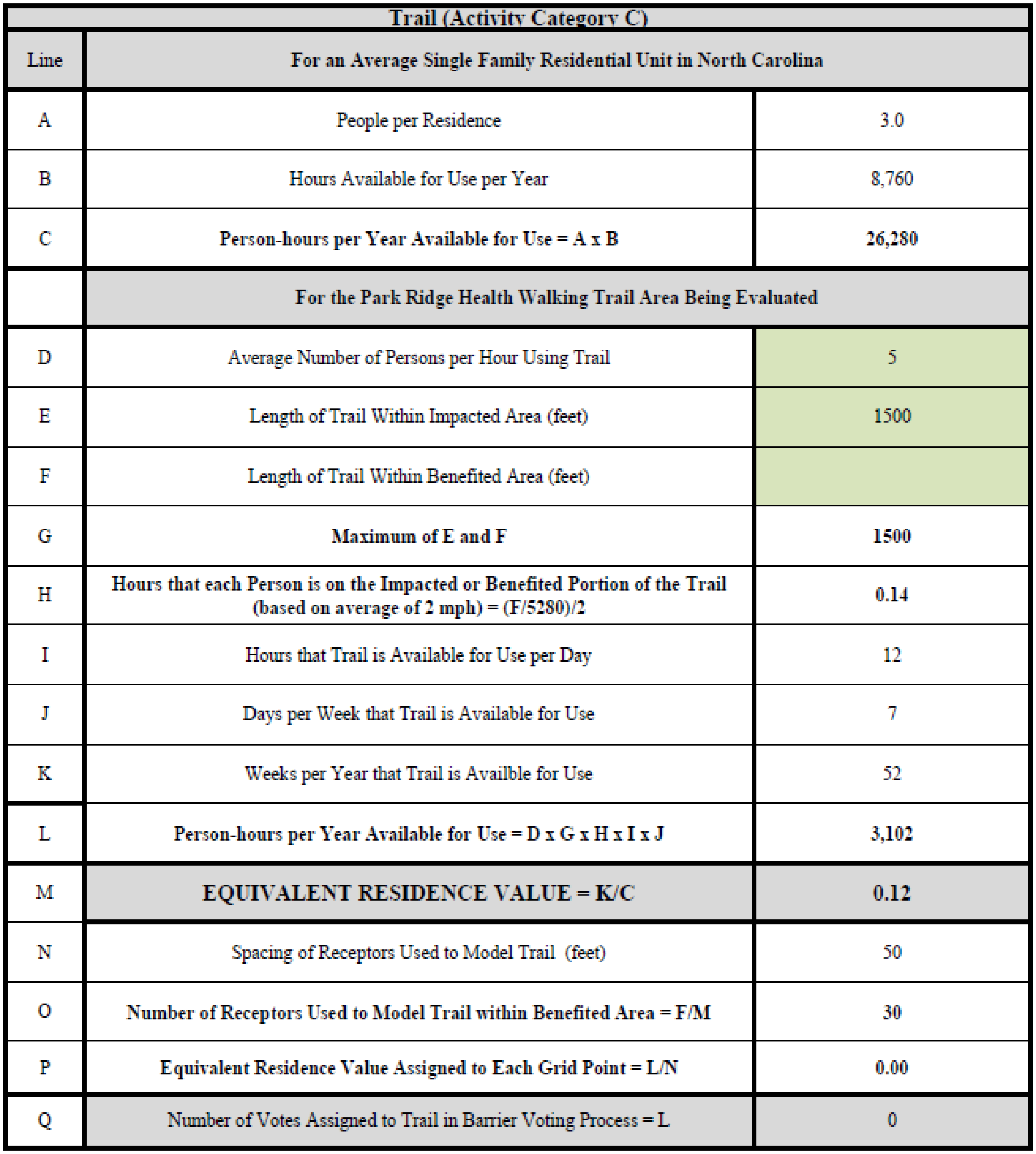
Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))			
ID#	Use	NAC	ERs	Address	Ex.	No-Build	Hybrid	Change
R-926	Res.	B	1	740 S Allen Rd	77	78	**78**	1
R-927	Res.	B	1	731 S Allen Rd	68	68	**70**	2
R-928	Res.	B	1	727 S Allen Rd	67	68	**69**	2
R-929	Community Center	E	1	722 S Allen Rd	76	77	**77**	1
R-930	Res.	E	1	973 E New Hope Rd	60	61	61	1
R-931	Res.	E	1	983 E New Hope Rd	60	60	61	1
R-932	Res.	B	1	999 E New Hope Rd	59	59	60	1
R-933	Res.	B	1	1075 E New Hope Rd	57	58	59	2
R-934	Res.	B	1	1108 E New Hope Rd	57	57	59	2
R-935	Res.	B	1	1103 E New Hope Rd	56	56	58	2
R-936	Res.	B	1	87 Carroll Oaks Dr	58	59	60	2
R-937	Res.	B	1	73 Carroll Oaks Dr	59	59	60	1
R-938	Res.	B	1	45 Carroll Oaks Dr	55	56	57	2
R-939	Res.	B	1	25 Carroll Oaks Dr	61	61	63	2
R-940	Res.	B	1	11 Carroll Oaks Dr	65	65	**67**	2
R-941	Res.	B	1	713 S Allen Rd	65	66	**67**	2
R-942	Res.	B	1	709 S Allen Rd	63	63	65	2
R-943	Res.	B	1	695 S Allen Rd	66	67	**68**	2
R-944	Res.	B	1	691 S Allen Rd	68	69	**70**	2
R-945	Res.	B	1	677 S Allen Rd	74	74	**75**	1
R-946	Baseball Field	B	1	401 E Campus Dr - Baseball Field	62	63	65	3
R-947	Res.	B	1	92 Merry Oaks Ln	70	71	**72**	2
R-948	Res.	B	1	87 Merry Oaks Ln	60	60	62	2
R-949	Res.	B	1	630 S Allen Rd	64	65	**68**	4
R-950	Res.	B	1	600 S Allen Rd	73	73	**74**	1
R-951	Res.	B	1	580 S Allen Rd	58	59	60	2
R-952	Res.	B	1	292 Coleman Dr	63	64	64	1
Predicted NSA 13 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							40[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 13 = 40.
5. Negative change in noise level between Existing Condition and Hybrid 6/8-Lane Widening Alternative is caused by coarse existing survey data that results in slightly different elevations for the nearby I-26 mainline roadway segments between the two alternatives.

Table B-14: Noise Sensitive Receptors and Hourly Equivalent Noise Levels
Hybrid 6/8-Lane Widening Alternative – NSA 14

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**			
ID#	**Use**	**NAC**	**ERs**	**Address**	**Ex.**	**No-Build**	**Hybrid**	**Change**
R-953	Res.	B	1	536 Crest Rd	72	73	**73**	1
R-954	Res.	B	1	511 Crest Rd	62	63	64	2
R-955	Res.	B	1	125 Victoria Springs Dr	62	64	65	3
R-956	Res.	B	1	149 Victoria Springs Dr	65	67	**68**	3
R-957	Res.	B	1	152 Victoria Springs Dr	68	70	**70**	2
R-958	Res.	B	1	134 Victoria Springs Dr	64	66	**66**	2
R-959	Res.	B	1	129 Hollyhock Ct	67	69	**69**	2
R-960	Res.	B	1	107 Hollyhock Ct	63	65	**66**	3
R-961	Res.	B	1	83 Hollyhock Ct	61	63	63	2
R-962	Res.	B	1	110 Hollyhock Ct	65	67	**67**	2
R-963	Res.	B	1	142 Hollyhock Ct	69	71	**71**	2
R-964	Res.	B	1	54 Hollyhock Ct	61	63	63	2
R-965	Res.	B	1	646 Oak Grove Rd	64	66	**66**	2
R-966	Res.	B	1	640 Oak Grove Rd	65	67	**67**	2
Predicted NSA 14 Hybrid 6/8-Lane Widening Alternative 2040 Traffic Noise Impacts[3,4]							10[1]	0[2]

1. Predicted traffic noise level impact due to approaching or exceeding NAC.
2. Predicted "substantial increase" traffic noise level impact.
3. The number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion (e.g. if a receptor is impacted by the NAC and a substantial increase, it is counted as only one impact).
4. Total number of predicted traffic noise impacts under the Hybrid 6/8-Lane Widening Alternative for NSA 14 = 10.

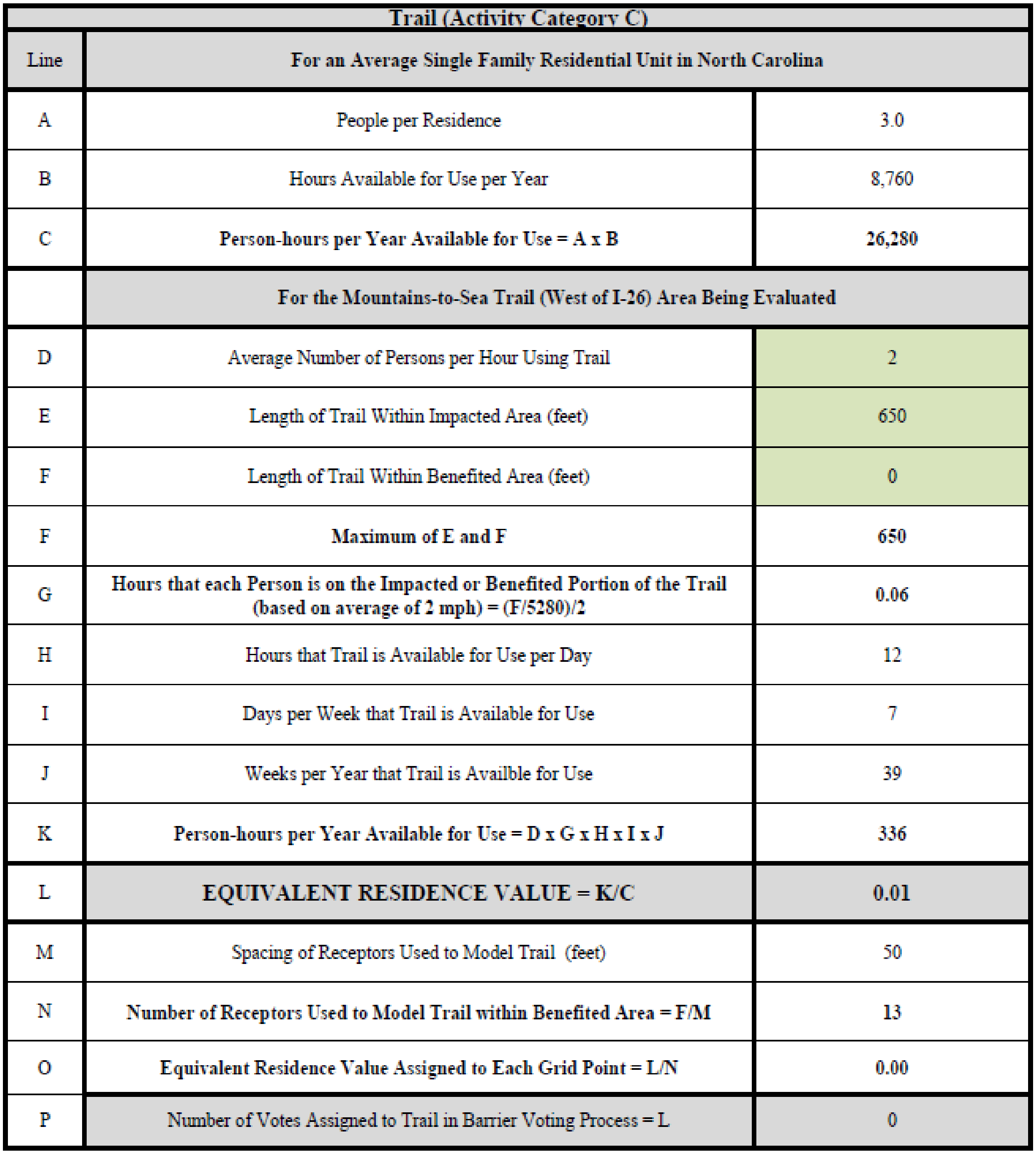


Trail (Activity Category C)

Line	For an Average Single Family Residential Unit in North Carolina	
A	People per Residence	3.0
B	Hours Available for Use per Year	8,760
C	**Person-hours per Year Available for Use = A x B**	**26,280**
	For the Park Ridge Health Walking Trail Area Being Evaluated	
D	Average Number of Persons per Hour Using Trail	5
E	Length of Trail Within Impacted Area (feet)	1500
F	Length of Trail Within Benefited Area (feet)	
G	**Maximum of E and F**	**1500**
H	**Hours that each Person is on the Impacted or Benefited Portion of the Trail (based on average of 2 mph) = (F/5280)/2**	**0.14**
I	Hours that Trail is Available for Use per Day	12
J	Days per Week that Trail is Available for Use	7
K	Weeks per Year that Trail is Availble for Use	52
L	**Person-hours per Year Available for Use = D x G x H x I x J**	**3,102**
M	**EQUIVALENT RESIDENCE VALUE = K/C**	**0.12**
N	Spacing of Receptors Used to Model Trail (feet)	50
O	**Number of Receptors Used to Model Trail within Benefited Area = F/M**	**30**
P	**Equivalent Residence Value Assigned to Each Grid Point = L/N**	**0.00**
Q	Number of Votes Assigned to Trail in Barrier Voting Process = L	0

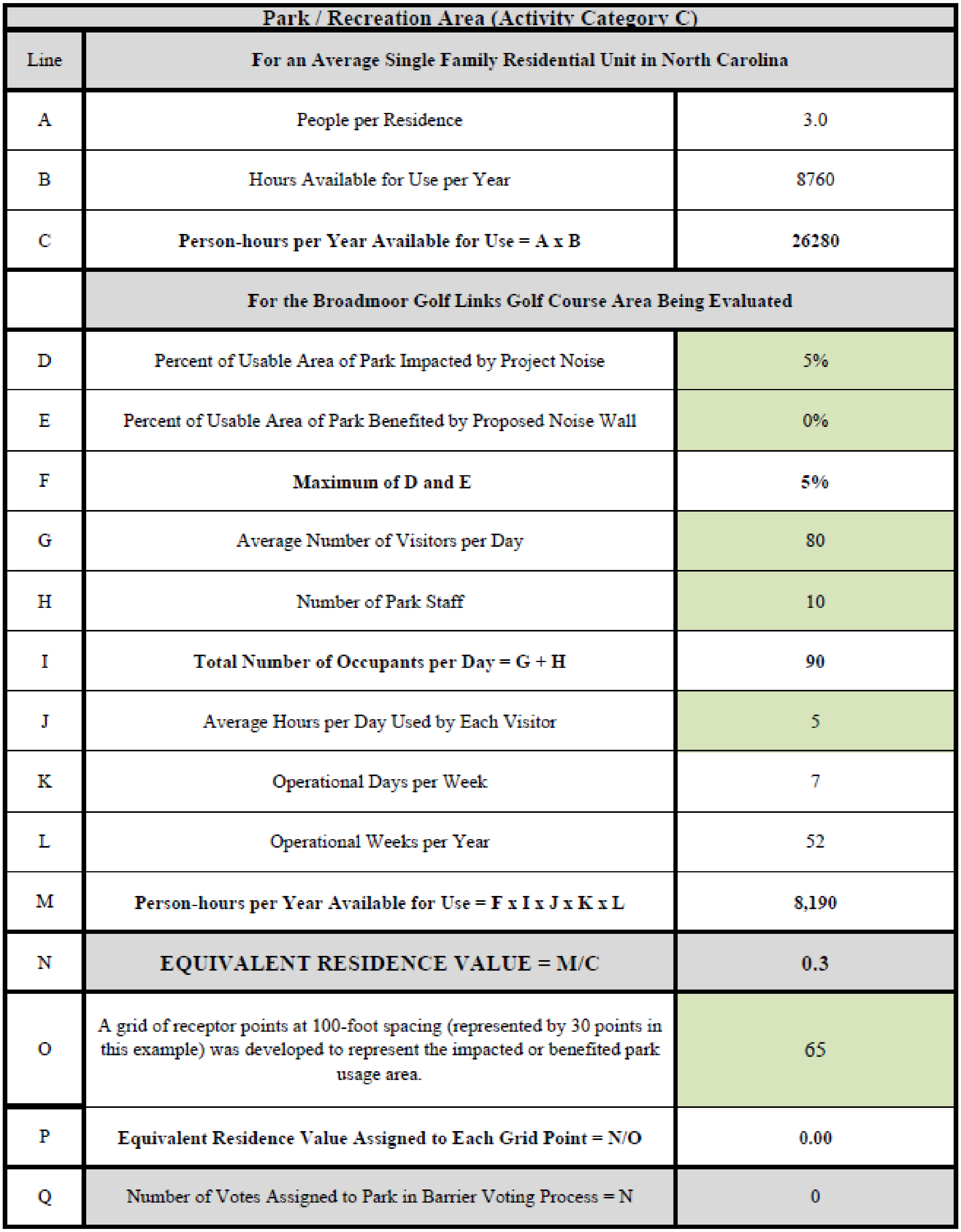
Trail (Activity Category C)

Line	For an Average Single Family Residential Unit in North Carolina	
A	People per Residence	3.0
B	Hours Available for Use per Year	8,760
C	**Person-hours per Year Available for Use = A x B**	**26,280**
	For the Mountains-to-Sea Trail (East of I-26) Area Being Evaluated	
D	Average Number of Persons per Hour Using Trail	2
E	Length of Trail Within Impacted Area (feet)	350
F	Length of Trail Within Benefited Area (feet)	0
F	**Maximum of E and F**	**350**
G	**Hours that each Person is on the Impacted or Benefited Portion of the Trail (based on average of 2 mph) = (F/5280)/2**	**0.03**
H	Hours that Trail is Available for Use per Day	12
I	Days per Week that Trail is Available for Use	7
J	Weeks per Year that Trail is Availble for Use	39
K	**Person-hours per Year Available for Use = D x G x H x I x J**	**181**
L	**EQUIVALENT RESIDENCE VALUE = K/C**	**0.01**
M	Spacing of Receptors Used to Model Trail (feet)	50
N	**Number of Receptors Used to Model Trail within Benefited Area = F/M**	**7**
O	**Equivalent Residence Value Assigned to Each Grid Point = L/N**	**0.00**
P	Number of Votes Assigned to Trail in Barrier Voting Process = L	0



Trail (Activity Category C)

Line	For an Average Single Family Residential Unit in North Carolina	
A	People per Residence	3.0
B	Hours Available for Use per Year	8,760
C	**Person-hours per Year Available for Use = A x B**	**26,280**
	For the Mountains-to-Sea Trail (West of I-26) Area Being Evaluated	
D	Average Number of Persons per Hour Using Trail	2
E	Length of Trail Within Impacted Area (feet)	650
F	Length of Trail Within Benefited Area (feet)	0
F	**Maximum of E and F**	**650**
G	**Hours that each Person is on the Impacted or Benefited Portion of the Trail (based on average of 2 mph) = (F/5280)/2**	**0.06**
H	Hours that Trail is Available for Use per Day	12
I	Days per Week that Trail is Available for Use	7
J	Weeks per Year that Trail is Availble for Use	39
K	**Person-hours per Year Available for Use = D x G x H x I x J**	**336**
L	**EQUIVALENT RESIDENCE VALUE = K/C**	**0.01**
M	Spacing of Receptors Used to Model Trail (feet)	50
N	**Number of Receptors Used to Model Trail within Benefited Area = F/M**	**13**
O	**Equivalent Residence Value Assigned to Each Grid Point = L/N**	**0.00**
P	Number of Votes Assigned to Trail in Barrier Voting Process = L	0



Park / Recreation Area (Activity Category C)

Line	For an Average Single Family Residential Unit in North Carolina	
A	People per Residence	3.0
B	Hours Available for Use per Year	8760
C	**Person-hours per Year Available for Use = A x B**	**26280**
	For the Broadmoor Golf Links Golf Course Area Being Evaluated	
D	Percent of Usable Area of Park Impacted by Project Noise	5%
E	Percent of Usable Area of Park Benefited by Proposed Noise Wall	0%
F	**Maximum of D and E**	**5%**
G	Average Number of Visitors per Day	80
H	Number of Park Staff	10
I	**Total Number of Occupants per Day = G + H**	**90**
J	Average Hours per Day Used by Each Visitor	5
K	Operational Days per Week	7
L	Operational Weeks per Year	52
M	**Person-hours per Year Available for Use = F x I x J x K x L**	**8,190**
N	**EQUIVALENT RESIDENCE VALUE = M/C**	**0.3**
O	A grid of receptor points at 100-foot spacing (represented by 30 points in this example) was developed to represent the impacted or benefited park usage area.	65
P	**Equivalent Residence Value Assigned to Each Grid Point = N/O**	**0.00**
Q	Number of Votes Assigned to Park in Barrier Voting Process = N	0

Park / Recreation Area (Activity Category C)

Line	For an Average Single Family Residential Unit in North Carolina	
A	People per Residence	3.0
B	Hours Available for Use per Year	8760
C	**Person-hours per Year Available for Use = A x B**	**26280**
	For the Champions Golf Learning Center Recreational Area Being Evaluated	
D	Percent of Usable Area of Park Impacted by Project Noise	80%
E	Percent of Usable Area of Park Benefited by Proposed Noise Wall	0%
F	**Maximum of D and E**	**80%**
G	Average Number of Visitors per Day	36
H	Number of Park Staff	5
I	**Total Number of Occupants per Day = G + H**	**41**
J	Average Hours per Day Used by Each Visitor	2
K	Operational Days per Week	7
L	Operational Weeks per Year	42
M	**Person-hours per Year Available for Use = F x I x J x K x L**	**19,286**
N	**EQUIVALENT RESIDENCE VALUE = M/C**	**0.7**
O	A grid of receptor points at 100-foot spacing (represented by 30 points in this example) was developed to represent the impacted or benefited park usage area.	71
P	**Equivalent Residence Value Assigned to Each Grid Point = N/O**	0.01
Q	Number of Votes Assigned to Park in Barrier Voting Process = N	1

Appendix C

Traffic Noise Models

Appendix C: Traffic Noise Models

General

The appendix documents the TNM Model Inputs used in this Traffic Noise Report. The models utilized various TNM object types to approximate the traffic segments assessed for the I-4400 / I-4700 project:

- Roadway
- Receptors
- Barriers
- Terrain Lines
- Tree Zones
- Ground Zones

Coordinate System
Each of the TNM Objects was modeled using the North American Datum 1983 (NAD83) horizontal coordinate system, and North American Vertical Datum 1988 (NAVD88).

Modeling Procedure
Roadways:
TNM Roadway Element widths were selected based upon representation of one (1) or two (2) lanes of traffic per TNM roadway element. For the proposed facility, TNM Roadway vertices were selected to represent interval lengths that appropriately represent fluctuations in the horizontal and vertical roadway geometry. For facilities in which more than one parallel TNM roadway element were modeled, the modeled roadway lane widths were set to ensure horizontal overlapping of adjacent modeled roadway elements. Overlapping TNM roadway elements is necessary to accurately represent the contiguous paved surface. TNM roadway elements of various widths were also modeled to represent the existing local roadways.

Receptors:
TNM Receptor Elements were modeled by assigning a point location to the most sensitive likely ‘exterior area of frequent human use’ for each residence, school, church, and noise-sensitive commercial land use within the project limits. All receptors in the TNM models were assigned a height of 4.92 feet except for upper level multi-family units, which were assigned a height of 14.92 feet if second floor and 24.92 feet if third floor. Given the non-homogeneous terrain and resulting inconsistent intervening source-to-receptor topography throughout the project vicinity, noise levels at each discrete receptor were determined by means of modeling an individual TNM receptor at all representative locations for ‘loudest-condition’ Base Year 2011, Design Year 2040 No- Build, and Design Year 2040 Hybrid 6/8-Lane Widening Alternative Build-condition predicted traffic.

Barriers:
Houses, office buildings, and other structures were individually modeled as barriers in the TNM models and assigned heights based on observations of the structures. Generally, structures were assumed to be 10-feet tall per story. Existing and proposed jersey barriers on roadways in the project study area were modeled as 46-inch high barriers (3.83 feet).

Noise walls for abatement of predicted traffic noise impacts were also input to the TNM models using logical alignments based on the topography between I-26 and the nearby receptors. In general, equally spaced barrier segments of 60 feet were used to coincide with the least common multiple of typical constructed panel lengths, 10-foot, 12-foot and 15-foot. However, some variable barrier segment lengths were used to better represent the topography and proposed right-of-way. Barrier heights were generally analyzed with a maximum height of 25 feet and an incremental increase of two (2) feet.

Terrain Lines (Elevation Contours):
Elevations (vertical, “Z” coordinates) were input into TNM by hand (typing) the English coordinate values of vertices that define significant changes in grades and/or slopes throughout the study area.

Tree Zones:
Tree Zones were defined at vertices along the perimeter of areas with dense foliage likely to impact traffic noise levels in the vicinity of the I-4400 / I-4700 project. For each tree zone, an average height was assigned based on general observations of the area.

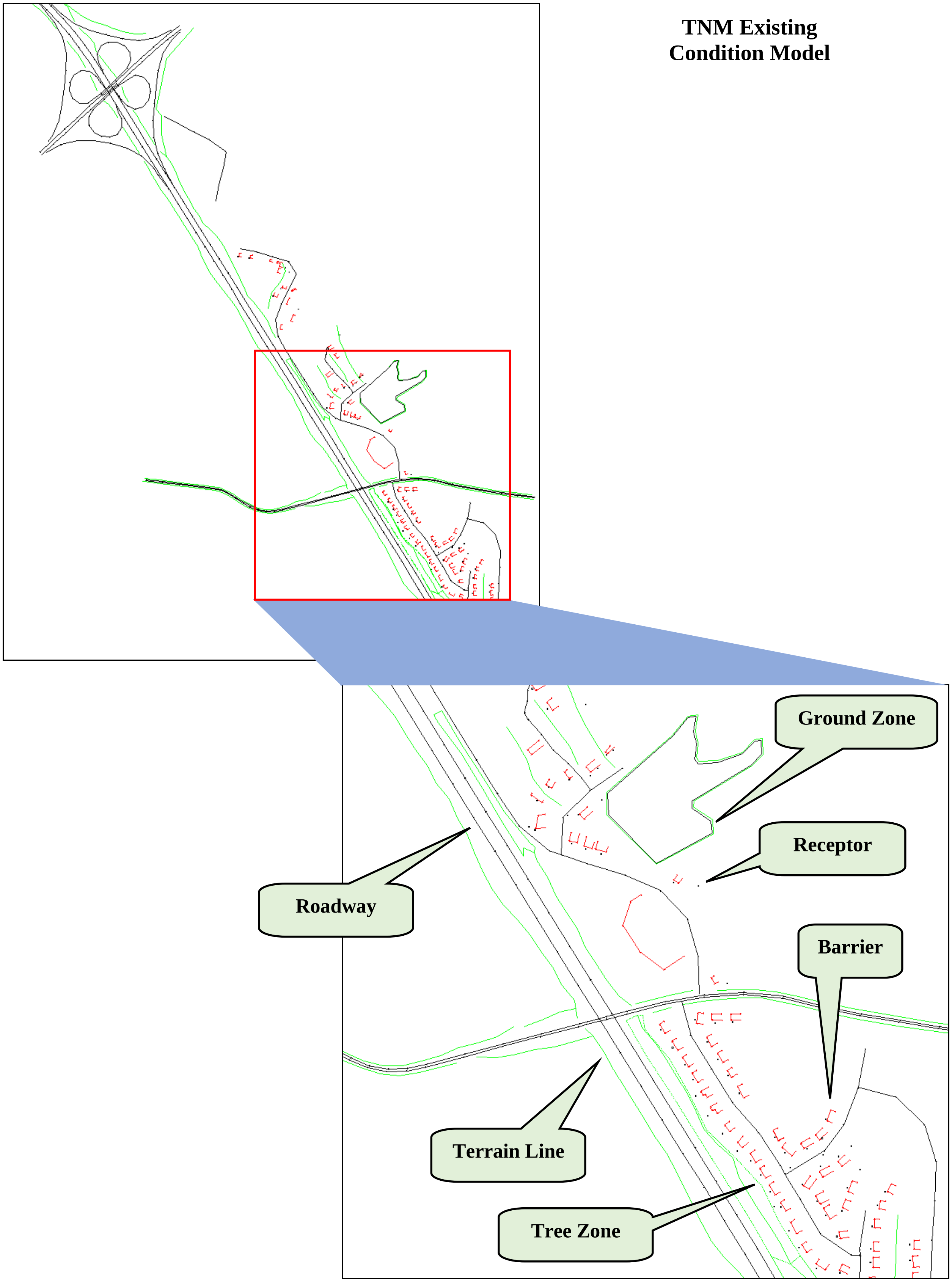
Ground Zones:
Ground Zones were defined at vertices along the perimeter of areas where the ground surface differed from the typical soil condition in the area and, therefore, could impact the predicted noise levels. Since ground zones do not define elevation, terrain lines were developed around each ground zone to ensure accurate representation of the topography in the model.

TNM Model Traffic Noise Level Assessment

The TNM model traffic noise level assessment is divided into four tasks:

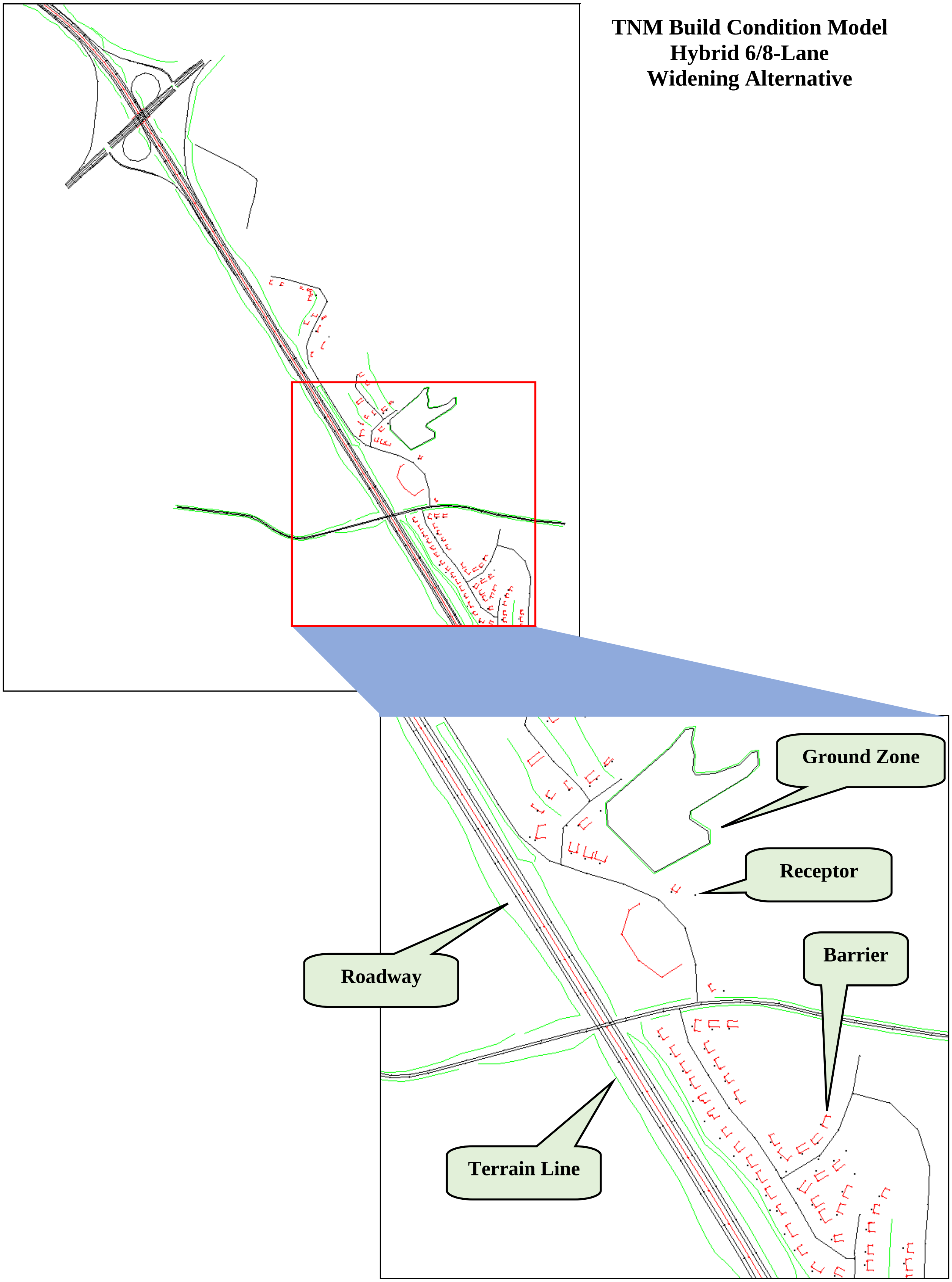
1. Creation of Validated TNM Computer Model(s)
2. Assessment of Existing Loudest-Hour Traffic Noise Levels
3. Assessment of Predicted Loudest-Hour Design Year No-Build and Build-Condition Without-Barrier Levels
4. Assessment of Predicted Loudest-Hour Design Year Build-Condition With-Barrier Levels

The following pages show TNM screenshots of representative models for the existing and build conditions.



TNM Existing Condition Model

TNM Build Condition Model
Hybrid 6/8-Lane
Widening Alternative



Validation

TNM model validation is the process by which the precision of the modeled relationship between traffic and equivalent noise levels is refined and/or confirmed. If the TNM model is well-constituted, it should generate predicted traffic noise levels that are similar to the ambient noise levels obtained in the field. If the tolerance between TNM-predicted and ambient noise monitored noise levels is not within ±3.0 dB(A), then the model must be adjusted, as appropriate. A TNM model is considered to be validated if it is a reasonable representation of the existing noise study area and/or project area, and the TNM-predicted noise levels are within ±3.0 dB(A) at all monitoring locations for which traffic was the dominant noise source.

The I-4400/I-4700 TNM models validated ambient noise level data to within acceptable tolerance levels for 79 of the 81 modeled ambient monitoring locations. Information on the validation process and results, including explanations for the two sites that did not validate, can be found in Table C-1.

Table C-1
TNM Validation Results

Monitoring Site	TNM-Predicted $L_{eq(h)}$ dB(A)[1]	Measured $L_{eq(h)}$ dB(A)[1]	Validation Delta (Pred. – Meas.)[1]	TNM Validation Run
0.1	65.3	63.6	**1.7**	Val_M0
0.2	58.9	57.9	**1.0**	Val_M0
0.3	57.9	56.2	**1.7**	Val_M0
1.1	65.8	64.6	**1.2**	Val_M1
1.2	56.1	55.3	**0.8**	Val_M1
1.3	52.3	53.4	**-1.1**	Val_M1
2.1	59.3	59.7	**-0.4**	Val_M2
2.2	58.7	58.3	**0.4**	Val_M2
2.3	57.4	56.7	**0.7**	Val_M2
3.1	67.7	62.0	**5.7**[2]	Val_M3
3.2	58.0	56.7	**1.3**	Val_M3
3.3	52.1	52.0	**0.1**	Val_M3
4.1	64.8	63.9	**0.9**	Val_M4
4.2	54.4	55.1	**-0.7**	Val_M4
4.3	50.5	51.9	**-1.4**	Val_M4
5.1	65.6	65.0	**0.6**	Val_M5
5.2	58.6	60.2	**-1.6**	Val_M5
5.3	53.7	55.2	**-1.5**	Val_M5
6.1	70.7	69.4	**1.3**	Val_M6
6.2	62.4	61.6	**0.8**	Val_M6
6.3	56.7	58.2	**-1.5**	Val_M6
7.1	62.8	62.8	**0.0**	Val_M7
7.2	57.4	56.3	**1.1**	Val_M7
7.3	55.1	54.1	**1.0**	Val_M7
8.1	58.2	59.9	**-1.7**	Val_M8
8.2	59.6	61.1	**-1.5**	Val_M8
8.3	69.5	69.1	**0.4**	Val_M8
9.1	70.2	69.2	**1.0**	Val_M9
9.2	61.9	62.1	**-0.2**	Val_M9
9.3	60.1	59.2	**0.9**	Val_M9

---

[1] Hourly equivalent noise levels, Leq(h), are expressed to the nearest one-tenth decibels to ensure that TNM-predicted levels validate to within +/- 3.0 dB(A) of measured noise levels without the benefits of rounding.

[2] Unable to validate. Fluctuations in terrain near I-26 were observed to be more significant in the field than in the digital terrain model. Second and third row monitors in this area validated.

Table C-1
TNM Validation Results

Monitoring Site	TNM-Predicted $L_{eq(h)}$ dB(A)[1]	Measured $L_{eq(h)}$ dB(A)[1]	Validation Delta (Pred. – Meas.)[1]	TNM Validation Run
10.1	65.4	64.6	**0.8**	Val_M10
10.2	62.6	63.1	**-0.5**	Val_M10
10.3	59.0	59.1	**-0.1**	Val_M10
11.1	67.2	65.9	**1.3**	Val_M11
11.2	60.1	59.9	**0.2**	Val_M11
11.3	60.7	60.3	**0.4**	Val_M11
12.1	64.1	62.4	**1.7**	Val_M12
12.2	58.0	58.5	**-0.5**	Val_M12
12.3	55.5	54.0	**1.5**	Val_M12
13.1	68.9	67.4	**1.5**	Val_M13
13.2	68.7	69.2	**-0.5**	Val_M13
13.3	65.0	64.1	**0.9**	Val_M13
14.1	63.4	62.6	**0.8**	Val_M14
14.2	61.9	60.3	**1.6**	Val_M14
14.3	57.3	55.8	**1.5**	Val_M14
15.1	62.2	61.6	**0.6**	Val_M15
15.2	57.9	58.1	**-0.2**	Val_M15
15.3	54.4	56.0	**-1.6**	Val_M15
16.1	70.6	69.3	**1.3**	Val_M16
16.2	63.1	63.3	**-0.2**	Val_M16
16.3	61.4	62.3	**-0.9**	Val_M16
17.1	70.1	68.6	**1.5**	Val_M17
17.2	62.1	61.8	**0.3**	Val_M17
17.3	54.6	54.6	**0.0**	Val_M17
18.1	68.8	67.9	**0.9**	Val_M18
18.2	67.3	65.8	**1.5**	Val_M18
18.3	68.5	68.0	**0.5**	Val_M18
19.1	68.3	67.5	**0.8**	Val_M19
19.2	66.7	66.0	**0.7**	Val_M19
19.3	62.9	62.0	**0.9**	Val_M19

[1] Hourly equivalent noise levels, Leq(h), are expressed to the nearest one-tenth decibels to ensure that TNM-predicted levels validate to within +/- 3.0 dB(A) of measured noise levels without the benefits of rounding.

[2] Unable to validate. Observed fluctuations in terrain near I-26 were less pronounced in the digital terrain model. However, second and third row monitors in this area validated.

Table C-1
TNM Validation Results

Monitoring Site	TNM-Predicted $L_{eq(h)}$ dB(A)[1]	Measured $L_{eq(h)}$ dB(A)[1]	Validation Delta (Pred. – Meas.)[1]	TNM Validation Run
20.1	75.6	76.0	**-0.4**	Val_M20
20.2	67.0	66.4	**0.6**	Val_M20
20.3	63.6	62.3	**1.3**	Val_M20
21.1	67.0	66.8	**0.2**	Val_M21
21.2	60.8	59.1	**1.7**	Val_M21
21.3	55.8	54.5	**1.3**	Val_M21
22.1	61.2	62.1	**-0.9**	Val_M22
22.2	58.6	59.4	**-0.8**	Val_M22
22.3	55.8	56.6	**-0.8**	Val_M22
23.1	70.8	70.3	**0.5**	Val_M23
23.2	69.7	69.0	**0.7**	Val_M23
23.3	65.7	65.2	**0.5**	Val_M23
24.1	63.4	63.9	**-0.5**	Val_M24
24.2	64.9	64.3	**0.6**	Val_M24
24.3	61.1	60.2	**0.9**	Val_M24
25.1	73.0	69.5	**3.5**[2]	Val_M25
25.2	61.3	61.9	**-0.6**	Val_M25
25.3	58.5	60.0	**-1.5**	Val_M25
26.1	64.0	64.0	**0.0**	Val_M26
26.2	63.0	61.5	**1.5**	Val_M26
26.3	58.2	56.5	**1.7**	Val_M26

[1] Hourly equivalent noise levels, Leq(h), are expressed to the nearest one-tenth decibels to ensure that TNM-predicted levels validate to within +/- 3.0 dB(A) of measured noise levels without the benefits of rounding.

[2] Unable to validate. Observed fluctuations in terrain near I-26 were less pronounced in the digital terrain model. However, second and third row monitors in this area validated.

Hybrid 6/8-Lane Widening Alternative
Design Year 2040
Noise Wall Analysis

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Hybrid 6/8-Lane Widening Alternative

A total of 30 noise walls have been evaluated for the Hybrid 6/8-Lane Widening Alternative. Six (6) noise walls presently meet feasibility and reasonableness criteria including: NW2.3 in NSA 2, NW4.1 and NW4.6 in NSA 4, NW5.3 in NSA 5, NW9.3 in NSA 9 and NW13.2 in NSA 13. The heights, lengths, areas, locations, noise level reductions, and benefits cited in this TNR represent a preliminary assessment of noise wall feasibility and reasonableness. Once the final project design is available, a final decision on feasibility and reasonableness will be made upon the completion of a Design Noise Report (DNR) and its acceptance by NCDOT and FHWA, as well as the public involvement process.

The summary of the evaluated noise walls is as follows:

NW1.1

Location: NW1.1 is located south of Crest Road, beginning along the shoulder of the I-26 westbound on-ramp from US 25 northbound and transitioning to the top of a cut section before ending near the Crest Road bridge over I-26. This noise wall provides abatement for residences on Bennison Lane.

Dimensions: Length = 2,460 ft., Avg. Height = 21 ft., Quantity = 51,985 ft^2
Impacts: 3
Benefits: 1
Quantity / Benefit: 51,985 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 1

This noise wall does not meet feasibility criteria because exterior noise levels could not be reduced by at least 5 dB(A) for at least two (2) impacted receptors.

Table D-1: Noise Wall –NW1.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-001	Res.	B	1	418 Felmet Rd	64	63	1
R-002	Res.	B	1	400 Felmet Rd	63	62	1
R-003	Res.	B	1	276 Felmet Rd	63	63	0
R-004	Res.	B	1	27 Bennison Ln	63	62	1
R-005	Res.	B	1	59 Bennison Ln	65	64	1
R-006	Res.	B	1	79 Bennison Ln	70	68	2
R-007	Res.	B	1	107 Bennison Ln	71	62	9
R-008	Res.	B	1	30 Bennison Ln	63	62	1
R-009	Res.	B	1	70 Bennison Ln	65	64	1
R-010	Res.	B	1	96 Bennison Ln	68	66	2

Table D-1: Noise Wall –NW1.1- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							1

🟥 Noise Level Impact	🟩 Benefited Receptor

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW1.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 3 **# BENEFITS -** 1 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	NO
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 51,985 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	NO
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW1.3

Location: NW1.3 is located just north of Crest Road along I-26 westbound beginning at the Crest Road bridge over I-26 and continuing approximately 2,160 feet in the northwest direction, transitioning from the top of a cut section near Crest Road to edge of shoulder. This noise wall provides abatement for residences accessible via Crest Road. An additional noise wall NW1.2, located just south of Crest Road, was considered to provide abatement for residences in this area as well, but was found not to provide any significant noise level reduction for impacted receptors.

Dimensions: Length = 2,160 ft., Avg. Height = 22 ft., Quantity = 46,335 ft^2
Impacts: 2
Benefits: 2
Quantity / Benefit: 23,168 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-2: Noise Wall –NW1.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-012	Res.	B	1	612 Crest Rd	**68**	63	**5**
R-013	Res.	B	1	622 Crest Rd	60	57	3
R-014	Res.	B	1	620 Crest Rd	**66**	59	**7**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW1.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 2 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 23,168 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW2.1-2.2

Location: NW2.1 begins approximately 2,160 feet south of Tracy Grove Road along I-26 westbound edge of shoulder and ends near the Tracy Grove Road bridge over I-26. NW2.2 begins just north of Tracy Grove Road along I-26 westbound edge of shoulder and continues approximately 420 feet. These noise walls provide abatement for residences along Tracy Grove Road, Justus Acres Lane and Randolph Avenue.

Dimensions: Length = 2,579 ft., Avg. Height = 21 ft., Quantity = 53,981 ft^2
Impacts: 4
Benefits: 7
Quantity / Benefit: 7,712 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 4

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-3: Noise Wall –NW2.1-2.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-019	Res.	B	1	35 Justus Acres Ln	63	57	6
R-020	Res.	B	1	28 Randolph Ave	63	58	5
R-021	Res.	B	1	30 Justus Acres Ln	65	59	6
R-022	Res.	B	1	19 Justus Acres Ln	66	60	6
R-023	Res.	B	1	818 Tracy Grove Rd	68	61	7
R-024	Res.	B	1	824 Tracy Grove Rd	66	61	5
R-025	Res.	B	1	821 Tracy Grove Rd	65	62	3
R-026	Res.	B	1	809 Mid Allen Rd	77	71	6
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							7

🟥	🟩
Noise Level Impact	**Benefited Receptor**

To be used with Traffic Noise Reports only

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW2.1-2.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 4 **# BENEFITS -** 7 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 7,712 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW2.3

Location: NW2.3 begins between Tracy Grove Road and Dana Road along I-26 westbound and continues approximately 3,120 feet, transitioning from the edge of shoulder to the top of a cut section, and ending near the Dana Road bridge over I-26. This noise wall provides abatement for residences along Springside Drive, Willowbrook Road and Maywood Road. An additional noise wall NW2.4, located just north of Tracy Grove Road, was considered to provide abatement for residences in this area as well, but was found not to provide any significant noise level reduction for impacted receptors.

Dimensions: Length = 3,120 ft., Avg. Height = 18 ft., Quantity = 57,391 ft^2
Impacts: 32
Benefits: 43
Quantity / Benefit: 1,335 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 30

This noise wall does meet feasibility and reasonableness criteria

Table D-4: Noise Wall –NW2.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-027	Res.	B	1	837 Mid Allen Rd	67	65	2
R-028	Res.	B	1	282 Katie Dr	65	60	5
R-029	Res.	B	1	33 Springside Dr	67	59	8
R-030	Res.	B	1	31 Springside Dr	66	58	8
R-031	Res.	B	1	29 Springside Dr	64	57	7
R-032	Res.	B	1	27 Springside Dr	62	57	5
R-033	Res.	B	1	25 Springside Dr	61	56	5
R-034	Res.	B	1	16 Springside Dr	62	54	8
R-035	Res.	B	1	18 Springside Dr	62	54	8
R-036	Res.	B	1	20 Springside Dr	64	55	9
R-037	Res.	B	1	22 Springside Dr	64	55	9
R-038	Res.	B	1	24 Springside Dr	65	58	7
R-039	Res.	B	1	26 Springside Dr	67	58	9
R-040	Res.	B	1	28 Springside Dr	70	61	9
R-041	Res.	B	1	30 Springside Dr	70	61	9
R-042	Res.	B	1	32 Springside Dr	69	61	8
R-043	Res.	B	1	34 Springside Dr	67	59	8
R-044	Res.	B	1	36 Springside Dr	66	57	9
R-045	Res.	B	1	38 Springside Dr	66	59	7
R-046	Res.	B	1	40 Springside Dr	65	56	9

Table D-4: Noise Wall –NW2.3- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative							
Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-047	Res.	B	1	42 Springside Dr	62	54	8
R-048	Res.	B	1	44 Springside Dr	58	55	3
R-049	Res.	B	1	46 Springside Dr	57	57	0
R-050	Res.	B	1	43 Springside Dr	75	63	12
R-051	Res.	B	1	45 Springside Dr	76	63	13
R-052	Res.	B	1	47 Springside Dr	73	60	13
R-053	Res.	B	1	49 Springside Dr	71	62	9
R-054	Res.	B	1	152 Willowbrook Rd	69	59	10
R-055	Res.	B	1	150 Willowbrook Rd	73	66	7
R-056	Res.	B	1	148 Willowbrook Rd	76	66	10
R-057	Res.	B	1	146 Willowbrook Rd	75	64	11
R-058	Res.	B	1	144 Willowbrook Rd	71	64	7
R-059	Res.	B	1	142 Willowbrook Rd	71	64	7
R-060	Res.	B	1	138 Willowbrook Rd	70	64	6
R-061	Res.	B	1	134 Willowbrook Rd	71	63	8
R-062	Res.	B	1	130 Willowbrook Rd	74	63	11
R-063	Res.	B	1	126 Willowbrook Rd	74	61	13
R-064	Res.	B	1	122 Willowbrook Rd	73	62	11
R-065	Res.	B	1	118 Willowbrook Rd	76	64	12
R-066	Res.	B	1	114 Willowbrook Rd	74	66	8
R-067	Res.	B	1	110 Willowbrook Rd	74	67	7
R-068	Res.	B	1	106 Willowbrook Rd	75	68	7
R-069	Res.	B	1	102 Willowbrook Rd	75	68	7
R-070	Res.	B	1	59 Springside Dr	62	59	3
R-071	Res.	B	1	57 Springside Dr	53	51	2
R-072	Res.	B	1	55 Springside Dr	59	57	2
R-073	Res.	B	1	53 Springside Dr	67	62	5
R-074	Res.	B	1	147 Willowbrook Rd	65	62	3
R-075	Res.	B	1	145 Willowbrook Rd	65	62	3
R-076	Res.	B	1	131 Maywood Rd	62	60	2
R-077	Res.	B	1	127 Maywood Rd	58	56	2
R-078	Res.	B	1	123 Maywood Rd	56	54	2
R-079	Res.	B	1	119 Maywood Rd	59	58	1
R-080	Res.	B	1	116 Maywood Rd	54	51	3
R-081	Res.	B	1	120 Maywood Rd	49	48	1
R-082	Res.	B	1	124 Maywood Rd	53	52	1

Table D-4: Noise Wall –NW2.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-083	Res.	B	1	133 Willowbrook Rd	60	57	3
R-084	Res.	B	1	129 Willowbrook Rd	61	57	4
R-085	Res.	B	1	121 Willowbrook Rd	62	56	**6**
R-086	Res.	B	1	117 Willowbrook Rd	65	60	**5**
R-087	Res.	B	1	113 Willowbrook Rd	65	61	4
R-088	Res.	B	1	109 Willowbrook Rd	65	63	2
R-089	Res.	B	1	105 Willowbrook Rd	**66**	65	1
R-090	Res.	B	1	710 Dana Rd	60	58	2
R-091	Res.	B	1	714 Dana Rd	59	57	2
R-092	Res.	B	1	703 Dana Rd	63	63	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							43

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW2.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 32 **# BENEFITS -** 43 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 1,335 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	YES

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	YES
3.	Is the noise wall likely?	YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW2.5

Location: NW2.5 begins approximately 200 feet north of Dana Road along I-26 westbound and transitions from edge of shoulder to the top of a cut section, ending north of the East Prince Road dead end. This noise wall provides abatement to residences along East Prince Road, Lakeview Estate Drive and Wakefield Drive.

Dimensions: Length = 3,300 ft., Avg. Height = 17 ft., Quantity = 55,265 ft^2
Impacts: 12
Benefits: 15
Quantity / Benefit: 3,684 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 9

This noise wall <u>does not</u> meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-5: Noise Wall –NW2.5- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-093	Res.	B	1	410 Lakeview Estate Rd	61	57	4
R-094	Res.	B	1	420 Lakeview Estate Rd	63	57	**6**
R-095	Res.	B	1	422 Lakeview Estate Rd	64	60	4
R-096	Res.	B	1	424 Lakeview Estate Rd	64	60	4
R-097	Res.	B	1	426 Lakeview Estate Rd	**66**	61	**5**
R-098	Res.	B	1	102 Wakefield Dr	64	61	3
R-099	Res.	B	1	99 Wakefield Dr	**75**	**66**	**9**
R-100	Res.	B	1	418 E Prince Rd	**71**	63	**8**
R-101	Res.	B	1	419 Bird Haven Rd	**69**	63	**6**
R-102	Res.	B	1	417 Bird Haven Rd	65	61	4
R-103	Res.	B	1	414 Bird Haven Rd	61	58	3
R-104	Res.	B	1	416 Bird Haven Rd	60	58	2
R-105	Res.	B	1	25 Dove Valley Ln	60	57	3
R-106	Res.	B	1	23 Dove Valley Ln	59	57	2
R-107	Res.	B	12	81 Dove Valley Ln	62	60	2
R-108	Res.	B	1	420 Bird Haven Rd	**67**	64	3
R-109	Res.	B	1	424 Bird Haven Rd	**67**	64	3
R-110	Res.	B	1	411 Pine Hill Ln	**67**	65	2
R-111	Res.	B	1	508 E Prince Rd	**72**	63	**9**
R-112	Res.	B	1	510 E Prince Rd	**68**	60	**8**
R-113	Res.	B	1	520 E Prince Rd	63	58	**5**
R-114	Res.	B	1	518 E Prince Rd	64	58	**6**

Table D-5: Noise Wall –NW2.5- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-115	Res.	B	1	524 E Prince Rd	62	57	**5**
R-116	Res.	B	1	527 E Prince Rd	**69**	62	**7**
R-117	Res.	B	1	529 E Prince Rd	65	59	**6**
R-118	Res.	B	1	539 E Prince Rd	62	57	**5**
R-119	Res.	B	1	601 E Prince Rd	60	56	4
R-120	Res.	B	1	635 E Prince Rd	**66**	61	**5**
R-121	Res.	B	1	641 E Prince Rd	**69**	64	**5**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							15

🟥 **Noise Level Impact**

🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW2.5 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 12 **# BENEFITS -** 15 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 3,684 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW3.1

Location: NW3.1 begins approximately 300 feet north of the Clear Creek Road bridge over I-26 along I-26 westbound edge of shoulder and continues approximately 1,980 feet in the northwest direction. This noise wall provides abatement for residences along Clear Creek Road.

Dimensions: Length = 1,980 ft., Avg. Height = 13 ft., Quantity = 26,022 ft^2
Impacts: 6
Benefits: 6
Quantity / Benefit: 4,337 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 6

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-6: Noise Wall –NW3.1- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-133	Res.	B	1	1713 Clear Creek Rd	71	66	5
R-134	Res.	B	1	1733 Clear Creek Rd	71	64	7
R-135	Res.	B	1	1803 Clear Creek Rd	75	69	6
R-136	Res.	B	1	1845 Clear Creek Rd	72	65	7
R-137	Res.	B	1	1869 Clear Creek Rd	69	64	5
R-138	Res.	B	1	1959 Clear Creek Rd	66	61	5
R-139	Res.	B	1	1982 Clear Creek Rd	64	63	1
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							6

🟥 **Noise Level Impact**
🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW3.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 6 **# BENEFITS -** 6 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 4,337 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW4.1

Location: NW4.1 begins between Wendy Lane and Carolina Circle along I-26 westbound edge of shoulder and ends near the Brookside Camp Road bridge over I-26. This noise wall provides abatement for residences along Carolina Circle.

Dimensions: Length = 1,680 ft., Avg. Height = 20 ft., Quantity = 34,333 ft^2
Impacts: 42
Benefits: 23
Quantity / Benefit: 1,493 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 14

This noise wall does meet feasibility and reasonableness criteria.

Table D-7: Noise Wall -NW4.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-140	Res.	B	1	170 Hart Ln	**69**	**69**	0
R-141	Res.	B	1	32 Hart Ln	**72**	**72**	0
R-142	Res.	B	1	28 Hart Ln	**72**	**72**	0
R-143	Res.	B	1	22 Hart Ln	**72**	**72**	0
R-144	Res.	B	1	39 Keeneland Dr	**66**	**66**	0
R-145	Res.	B	1	23 Keeneland Dr	65	65	0
R-146	Res.	B	1	20 Keeneland Dr	**69**	**69**	0
R-147	Res.	B	1	171 Kingswood Dr	**68**	**68**	0
R-148	Res.	B	1	195 Kingswood Dr	**68**	**68**	0
R-149	Res.	B	1	10 Hart Ln	**75**	**75**	0
R-150	Res.	B	1	223 Kingswood Dr	**67**	**67**	0
R-151	Res.	B	1	192 Kingswood Dr	62	62	0
R-152	Res.	B	1	216 Kingswood Dr	64	64	0
R-153	Res.	B	1	240 Kingswood Dr	64	64	0
R-154	Res.	B	1	262 Kingswood Dr	64	64	0
R-155	Res.	B	1	282 Kingswood Dr	64	64	0
R-156	Res.	B	1	261 Kingswood Dr	**67**	**67**	0
R-157	Res.	B	1	275 Kingswood Dr	**66**	**66**	0
R-158	Res.	B	1	283 Kingswood Dr	**68**	**68**	0
R-159	Res.	B	1	339 Kingswood Dr	**70**	**70**	0
R-160	Res.	B	1	299 Kingswood Dr	**68**	**68**	0
R-161	Res.	B	1	345 Kingswood Dr	**70**	**70**	0
R-162	Res.	B	1	134 Wendy Ln	59	58	1
R-163	Res.	B	1	138 Wendy Ln	64	64	0

Table D-7: Noise Wall -NW4.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-164	Res.	B	1	142 Wendy Ln	73	73	0
R-165	Res.	B	1	146 Wendy Ln	73	73	0
R-166	Res.	B	1	150 Wendy Ln	76	76	0
R-167	Res.	B	1	154 Wendy Ln	78	78	0
R-168	Res.	B	1	149 Wendy Ln	63	63	0
R-169	Res.	B	1	151 Wendy Ln	70	70	0
R-170	Res.	B	1	153 Wendy Ln	69	69	0
R-171	Res.	B	1	155 Wendy Ln	66	66	0
R-172	Res.	B	1	157 Wendy Ln	71	71	0
R-173	Res.	B	1	132 Shelly Dr	54	53	1
R-174	Res.	B	1	142 Shelly Dr	52	52	0
R-175	Res.	B	1	144 Shelly Dr	52	52	0
R-176	Res.	B	1	160 Wendy Ln	77	77	0
R-177	Res.	B	1	2026 Howard Gap Rd	67	66	1
R-178	Res.	B	1	2020 Howard Gap Rd	68	64	4
R-179	Res.	B	1	335 Carolina Cir	78	65	13
R-180	Res.	B	1	315 Carolina Cir	71	63	8
R-181	Res.	B	1	289 Carolina Cir	67	60	7
R-182	Res.	B	1	257 Carolina Cir	59	56	3
R-183	Res.	B	1	251 Carolina Cir	59	56	3
R-184	Res.	B	1	223 Carolina Cir	59	56	3
R-185	Res.	B	1	205 Carolina Cir	60	57	3
R-186	Res.	B	1	185 Carolina Cir	60	57	3
R-187	Res.	B	1	165 Carolina Cir	60	57	3
R-188	Res.	B	1	145 Carolina Cir	62	59	3
R-189	Res.	B	1	125 Carolina Cir	63	60	3
R-190	Res.	B	1	113 Carolina Cir	63	61	2
R-191	Res.	B	1	93 Carolina Cir	63	61	2
R-192	Res.	B	1	73 Carolina Cir	62	61	1
R-193	Res.	B	1	55 Carolina Cir	62	61	1
R-194	Res.	B	1	35 Carolina Cir	61	60	1
R-195	Res.	B	1	512 Brookside Camp Rd	63	62	1
R-196	Res.	B	1	270 Carolina Cir	65	59	6
R-197	Res.	B	1	254 Carolina Cir	65	59	6
R-198	Res.	B	1	226 Carolina Cir	65	60	5
R-199	Res.	B	1	212 Carolina Cir	62	57	5

Table D-7: Noise Wall -NW4.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-200	Res.	B	1	192 Carolina Cir	63	58	**5**
R-201	Res.	B	1	172 Carolina Cir	62	58	4
R-202	Res.	B	1	152 Carolina Cir	62	57	**5**
R-203	Res.	B	1	132 Carolina Cir	63	58	**5**
R-204	Res.	B	1	112 Carolina Cir	62	57	**5**
R-205	Res.	B	1	100 Carolina Cir	61	58	3
R-206	Res.	B	1	74 Carolina Cir	59	57	2
R-207	Res.	B	1	60 Carolina Cir	62	61	1
R-208	Res.	B	1	42 Carolina Cir	63	62	1
R-209	Res.	B	1	322 Carolina Cir	**75**	63	**12**
R-210	Res.	B	1	374 Carolina Cir	**74**	62	**12**
R-211	Res.	B	1	380 Carolina Cir	**72**	62	**10**
R-212	Res.	B	1	210 Carolina Cir	**68**	60	**8**
R-213	Res.	B	1	426 Carolina Cir	**69**	61	**8**
R-214	Res.	B	1	446 Carolina Cir	**68**	59	**9**
R-215	Res.	B	1	518 Carolina Cir	65	59	**6**
R-216	Res.	B	1	536 Carolina Cir	65	61	4
R-217	Res.	B	1	556 Carolina Cir	64	62	2
R-218	Res.	B	1	576 Carolina Cir	**66**	64	2
R-219	Res.	B	1	464 Carolina Cir	**71**	64	**7**
R-220	Res.	B	1	472 Carolina Cir	**76**	**66**	**10**
R-221	Res.	B	1	505 Carolina Cir	**76**	**67**	**9**
R-222	Res.	B	1	537 Carolina Cir	**76**	**68**	**8**
R-223	Res.	B	1	557 Carolina Cir	**76**	**70**	**6**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							23

Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW4.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 43 **# BENEFITS -** 23 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 1,493 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	YES

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	YES
3.	Is the noise wall likely?	YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW4.2

Location: NW4.2 begins just north of Brookside Camp Road along I-26 westbound edge of shoulder and continues approximately 3,659 feet, before ending north of West Acorn Drive. It transitions to the top of a cut section at the weigh station located near Sheneman Drive before returning to edge of shoulder. This noise wall provides abatement for residences along Kimberly Ann Drive, Dundeve Circle, Sheneman Drive, Whispering Hills Drive and Acorn Drive.

Dimensions: Length = 3,659 ft., Avg. Height = 19 ft., Quantity = 68,695 ft^2
Impacts: 26
Benefits: 33
Quantity / Benefit: 2,082 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 23

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-8: Noise Wall -NW4.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-224	Res.	B	1	202 Kimberly Ann Dr	75	67	8
R-225	Res.	B	1	206 Dundeve Cir	74	67	7
R-226	Res.	B	1	208 Dundeve Cir	75	68	7
R-227	Res.	B	1	212 Dundeve Cir	76	70	6
R-228	Res.	B	1	216 Dundeve Cir	75	67	8
R-229	Res.	B	1	509 Brookside Camp Rd	61	59	2
R-230	Res.	B	1	203 Kimberly Ann Dr	64	62	2
R-231	Res.	B	1	207 Kimberly Ann Dr	63	60	3
R-232	Res.	B	1	211 Kimberly Ann Dr	63	60	3
R-233	Res.	B	1	217 Kimberly Ann Dr	62	59	3
R-234	Res.	B	1	206 Kimberly Ann Dr	66	61	5
R-235	Res.	B	1	209 Dundeve Cir	68	63	5
R-236	Res.	B	1	213 Dundeve Cir	65	58	7
R-237	Res.	B	1	237 Dundeve Cir	58	54	4
R-238	Res.	B	1	224 Dundeve Cir	71	61	10
R-239	Res.	B	1	228 Dundeve Cir	67	58	9
R-240	Res.	B	1	232 Dundeve Cir	62	55	7
R-241	Res.	B	1	236 Dundeve Cir	59	53	6
R-242	Res.	B	1	201 Sheneman Dr	71	62	9
R-243	Res.	B	1	213 Sheneman Dr	63	56	7

Table D-8: Noise Wall -NW4.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-244	Res.	B	1	217 Sheneman Dr	60	56	4
R-245	Res.	B	1	204 Sheneman Dr	**74**	64	**10**
R-246	Res.	B	1	212 Sheneman Dr	**68**	63	**5**
R-247	Res.	B	1	214 Sheneman Dr	63	61	2
R-248	Res.	B	1	300 Whispering Hills Dr	61	59	2
R-249	Res.	B	1	312 Whispering Hills Dr	**71**	**69**	2
R-250	Res.	B	1	319 Whispering Hills Dr	64	63	1
R-251	Res.	B	1	325 Whispering Hills Dr	64	62	2
R-252	Res.	B	1	329 Whispering Hills Dr	64	61	3
R-253	Res.	B	1	318 Whispering Hills Dr	**70**	**69**	1
R-254	Res.	B	1	320 Whispering Hills Dr	**72**	**70**	2
R-255	Res.	B	1	324 Whispering Hills Dr	**71**	**66**	**5**
R-256	Res.	B	1	326 Whispering Hills Dr	**67**	62	**5**
R-257	Res.	B	1	328 Whispering Hills Dr	65	59	**6**
R-258	Res.	B	1	330 Whispering Hills Dr	63	58	**5**
R-259	Res.	B	1	336 Whispering Hills Dr	62	58	4
R-260	Res.	B	1	185 Acorn Dr	**77**	63	**14**
R-261	Res.	B	1	120 Acorn Dr	**72**	60	**12**
R-262	Res.	B	1	112 Acorn Dr	**68**	58	**10**
R-263	Res.	B	1	108 Acorn Dr	65	58	**7**
R-264	Res.	B	1	40 Acorn Dr	65	57	**8**
R-265	Res.	B	1	181 Acorn Dr	**77**	63	**14**
R-266	Res.	B	1	119 Acorn Dr	**74**	62	**12**
R-267	Res.	B	1	115 Acorn Dr	**72**	61	**11**
R-268	Res.	B	1	105 W Acorn Dr	**69**	60	**9**
R-269	Res.	B	1	131 W Acorn Dr	**71**	62	**9**
R-270	Res.	B	1	188 W Acorn Dr	**69**	64	**5**
R-271	Res.	B	1	107 Acorn Dr	65	59	**6**
R-272	Res.	B	1	45 Acorn Dr	61	56	**5**
R-273	Res.	B	1	402 Silver Loop Dr	62	58	4
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							33

Noise Level Impact

Benefited Receptor

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW4.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 26 **# BENEFITS -** 33 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,082 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW4.3

Location: NW4.3 is located between Brookside Camp Road and Naples Road at the top of a cut section along I-26 westbound. This noise wall provides abatement for the Park Ridge Health walking trail, as well as a residence on PJ's Place.

Dimensions: Length = 2,400 ft., Avg. Height = 20 ft., Quantity = 47,219 ft^2
Impacts: 2
Benefits: 2
Quantity / Benefit: 23,610 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-9: Noise Wall –NW4.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-274	Res.	B	1	294 Pjs Pl	66	61	5
R-275.01	Trail	C	0.024[1]	100 Hospital Dr	56	54	2
R-275.02	Trail	C	0.024[1]	100 Hospital Dr	57	55	2
R-275.03	Trail	C	0.024[1]	100 Hospital Dr	58	56	2
R-275.04	Trail	C	0.024[1]	100 Hospital Dr	59	57	2
R-275.05	Trail	C	0.024[1]	100 Hospital Dr	61	59	2
R-275.06	Trail	C	0.024[1]	100 Hospital Dr	63	61	2
R-275.07	Trail	C	0.024[1]	100 Hospital Dr	65	61	4
R-275.08	Trail	C	0.024[1]	100 Hospital Dr	67	62	5
R-275.09	Trail	C	0.024[1]	100 Hospital Dr	69	63	6
R-275.10	Trail	C	0.024[1]	100 Hospital Dr	71	63	8
R-275.11	Trail	C	0.024[1]	100 Hospital Dr	75	65	10
R-275.12	Trail	C	0.024[1]	100 Hospital Dr	77	64	13
R-275.13	Trail	C	0.024[1]	100 Hospital Dr	78	63	15
R-275.14	Trail	C	0.024[1]	100 Hospital Dr	78	63	15
R-275.15	Trail	C	0.024[1]	100 Hospital Dr	79	62	17
R-275.16	Trail	C	0.024[1]	100 Hospital Dr	79	62	17
R-275.17	Trail	C	0.024[1]	100 Hospital Dr	79	61	18
R-275.18	Trail	C	0.024[1]	100 Hospital Dr	79	61	18
R-275.19	Trail	C	0.024[1]	100 Hospital Dr	79	61	18
R-275.20	Trail	C	0.024[1]	100 Hospital Dr	79	60	19
R-275.21	Trail	C	0.024[1]	100 Hospital Dr	79	61	18
R-275.22	Trail	C	0.024[1]	100 Hospital Dr	79	62	17

Table D-9: Noise Wall –NW4.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-275.23	Trail	C	0.024[1]	100 Hospital Dr	79	62	17
R-275.24	Trail	C	0.024[1]	100 Hospital Dr	79	62	17
R-275.25	Trail	C	0.024[1]	100 Hospital Dr	78	65	13
R-275.26	Trail	C	0.024[1]	100 Hospital Dr	75	67	8
R-275.27	Trail	C	0.024[1]	100 Hospital Dr	74	68	6
R-275.28	Trail	C	0.024[1]	100 Hospital Dr	73	69	4
R-275.29	Trail	C	0.024[1]	100 Hospital Dr	73	70	3
R-275.30	Trail	C	0.024[1]	100 Hospital Dr	73	70	3
R-275.31	Trail	C	0.024[1]	100 Hospital Dr	72	67	5
R-275.32	Trail	C	0.024[1]	100 Hospital Dr	71	66	5
R-275.33	Trail	C	0.024[1]	100 Hospital Dr	70	65	5
R-275.34	Trail	C	0.024[1]	100 Hospital Dr	68	64	4
R-275.35	Trail	C	0.024[1]	100 Hospital Dr	67	64	3
R-275.36	Trail	C	0.024[1]	100 Hospital Dr	66	63	3
R-275.37	Trail	C	0.024[1]	100 Hospital Dr	65	63	2
R-275.38	Trail	C	0.024[1]	100 Hospital Dr	65	63	2
R-275.39	Trail	C	0.024[1]	100 Hospital Dr	64	63	1
R-275.40	Trail	C	0.024[1]	100 Hospital Dr	65	64	1
R-275.41	Trail	C	0.024[1]	100 Hospital Dr	67	66	1
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2[2]

[1] Walking trail was analyzed as a nodal array of receptors (1 equivalent residence represented by 41 nodes).

[2] Total benefits for walking trail were rounded up to the nearest whole dB(A).

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW4.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 2 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☑ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 23,610 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW4.4-4.5

Location: NW4.4 begins approximately 1,920 feet south of Naples Road along I-26 westbound at the top of a cut section and ends near the Naples Road bridge over I-26. NW4.5 is located just north of Naples Road along I-26 westbound edge of shoulder and continues approximately 1,020 feet in the northwest direction. These noise walls provide abatement for residences along Sunset Vista Road and Twin Springs Road.

Dimensions: Length = 2,940 ft., Avg. Height = 21 ft., Quantity = 60,402 ft^2
Impacts: 11
Benefits: 9
Quantity / Benefit: 6,711 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 9

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-10: Noise Wall –NW4.4-4.5- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-284	Res.	B	1	18 Sunset Vista Rd	**75**	**68**	**7**
R-285	Res.	B	1	46 Sunset Vista Rd	**67**	62	**5**
R-286	Res.	B	1	72 Sunset Vista Rd	**67**	62	**5**
R-287	Res.	B	1	108 Sunset Vista Rd	65	61	4
R-288	Res.	B	1	126 Sunset Vista Rd	64	60	4
R-289	Res.	B	1	25 Sunset Vista Rd	**70**	65	**5**
R-290	Res.	B	1	91 Sunset Vista Rd	**72**	65	**7**
R-291	Res.	B	1	145 Sunset Vista Rd	**70**	64	**6**
R-292	Res.	B	1	56 Holly Oak Dr	63	59	4
R-293	Res.	B	1	67 Holly Oak Dr	61	58	3
R-294	Res.	B	1	25 Holly Oak Dr	**74**	**68**	**6**
R-295	Res.	B	1	104 Twin Springs Rd	**71**	**66**	**5**
R-296	Res.	B	1	118 Twin Springs Rd	**68**	64	4
R-297	Res.	B	1	146 Twin Springs Rd	**67**	65	2
R-298	Res.	B	1	141 Twin Springs Rd	**75**	**68**	**7**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							9

Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW4.4-4.5 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 11 **# BENEFITS -** 9 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 6,711 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW4.6

Location: NW4.6 is located along the I-26 westbound off-ramp to US 25 (Asheville Highway) beginning near the westbound bridge over railroad tracks and continuing along the edge of shoulder approximately 1,556 feet in the northwest direction. The portion of this wall along the bridge over railroad tracks is on structure. This noise wall provides abatement for residences on Old Hendersonville Road, November Lane and Hickory Flats Drive.

Dimensions: Length = 1,556 ft., Avg. Height = 15 ft., Quantity = 23,470 ft^2
Impacts: 15
Benefits: 30
Quantity / Benefit: 782 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 13

This noise wall does meet feasibility and reasonableness criteria.

Table D-11: Noise Wall –NW4.6- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-299	Res.	B	1	90 Community Rd	64	60	4
R-300	Res.	B	1	80 Community Rd	65	61	4
R-301	Res.	B	1	68 Community Rd	65	60	5
R-302	Res.	B	1	89 Community Rd	64	61	3
R-303	Res.	B	1	51 Community Rd	62	59	3
R-304	Res.	B	1	61 Community Rd	64	61	3
R-305	Res.	B	1	58 Community Rd	62	56	6
R-306	Res.	B	1	42 Community Rd	61	57	4
R-307	Res.	B	1	49 Community Rd	61	58	3
R-308	Res.	B	1	33 Community Rd	58	54	4
R-309	Res.	B	1	3 Community Rd	60	57	3
R-310	Res.	B	1	5 Community Rd	61	58	3
R-311	Res.	B	1	11 Community Rd	60	55	5
R-312	Res.	B	1	521 Old Hendersonville Rd	70	63	7
R-313	Res.	B	1	525 Old Hendersonville Rd	70	62	8
R-314	Res.	B	1	20 Pleasant Row Dr	67	58	9
R-315	Res.	B	1	15 Pleasant Row Dr	66	58	8
R-316	Res.	B	1	45 Pleasant Row Dr	66	58	8
R-317	Res.	B	1	105 Fender Dr	63	57	6
R-318	Res.	B	1	87 Fender Dr	61	54	7
R-319	Res.	B	1	80 Fender Dr	62	56	6

Table D-11: Noise Wall –NW4.6- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-320	Res.	B	1	71 Fender Dr	61	56	5
R-321	Res.	B	1	46 Fender Dr	60	54	6
R-322	Res.	B	1	526 Old Hendersonville Rd	67	59	8
R-323	Res.	B	1	522 Old Hendersonville Rd	67	59	8
R-324	Res.	B	1	19 November Ln	66	58	8
R-325	Res.	B	1	39 November Ln	66	58	8
R-326	Res.	B	1	37 November Ln	67	59	8
R-327	Res.	B	1	65 November Ln	70	61	9
R-328	Res.	B	1	244 Hickory Flats Dr	70	63	7
R-329	Res.	B	1	146 Hickory Flats Dr	65	61	4
R-330	Res.	B	1	60 November Ln	65	59	6
R-331	Res.	B	1	42 November Ln	64	57	7
R-332	Res.	B	1	434 Old Hendersonville Rd	64	57	7
R-333	Res.	B	1	414 Old Hendersonville Rd	62	55	7
R-334	Res.	B	1	372 Old Hendersonville Rd	60	54	6
R-335	Res.	B	1	362 Old Hendersonville Rd	59	53	6
R-336	Res.	B	1	352 Old Hendersonville Rd	59	52	7
R-337	Res.	B	1	211 Hickory Flats Dr	64	57	7
R-338	Res.	B	1	97 Hickory Flats Dr	66	58	8
R-339	Res.	B	1	71 Hickory Flats Dr	65	60	5
R-340	Res.	B	1	87 Hickory Flats Dr	63	60	3
R-341	Res.	B	1	67 Maxwell Dr	62	60	2
R-342	Res.	B	1	53 Maxwell Dr	60	60	0
R-343	Res.	B	1	54 Hickory Flats Dr	64	62	2
R-344	Res.	B	1	143 Maxwell Dr	69	69	0
R-345	Res.	B	1	109 Maxwell Dr	65	65	0
R-346	Res.	B	1	70 Maxwell Dr	65	64	1
R-347	Res.	B	1	54 Maxwell Dr	64	63	1
R-348	Res.	B	1	50 Maxwell Dr	59	59	0
R-349	Res.	B	1	48 Maxwell Dr	65	65	0
R-350	Res.	B	1	46 Maxwell Dr	68	68	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							30
					Noise Level Impact		**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW4.6 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 15 **# BENEFITS -** 30 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 782 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	YES

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	YES
3.	Is the noise wall likely?	YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW5.1

Location: NW5.1 is located between US 25 (Asheville Highway) and Butler Bridge Road at the top of a cut section along I-26 westbound beginning near the I-26 westbound on-ramp from US 25 (Asheville Highway) and continuing approximately 1,020 feet in the northwest direction. This noise wall provides abatement for residences on Halliburton Road, Kennerly Drive and Dawley Drive.

Dimensions: Length = 1,020 ft., Avg. Height = 21 ft., Quantity = 20,904 ft^2
Impacts: 8
Benefits: 4
Quantity / Benefit: 5,226 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 4

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-12: Noise Wall –NW5.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-351	Res.	B	1	23 Halliburton Rd	64	64	0
R-352	Res.	B	1	123 Halliburton Rd	77	72	5
R-353	Res.	B	1	118 Halliburton Rd	66	66	0
R-354	Res.	B	1	124 Halliburton Rd	65	65	0
R-355	Res.	B	1	54 Dawley Dr	64	63	1
R-356	Res.	B	1	46 Dawley Dr	67	66	1
R-357	Res.	B	1	44 Dawley Dr	64	62	2
R-358	Res.	B	1	55 Dawley Dr	60	56	4
R-359	Res.	B	1	15 Dawley Dr	70	65	5
R-360	Res.	B	1	103 Dawley Dr	62	60	2
R-361	Res.	B	1	100 Halliburton Rd	64	63	1
R-362	Res.	B	1	102 Halliburton Rd	63	62	1
R-363	Res.	B	1	104 Halliburton Rd	60	60	0
R-364	Res.	B	1	62 Dawley Dr	58	58	0
R-365	Res.	B	1	99 Dawley Dr	57	56	1
R-366	Res.	B	1	64 Halliburton Rd	64	63	1
R-367	Res.	B	1	128 Kennerly Dr	62	62	0
R-368	Res.	B	1	110 Kennerly Dr	60	60	0
R-369	Res.	B	1	96 Kennerly Dr	59	59	0
R-370	Res.	B	1	127 Kennerly Dr	66	66	0
R-371	Res.	B	1	46 Royal Oaks Dr	66	66	0

Table D-12: Noise Wall –NW5.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-372	Res.	B	1	106 Dawley Dr	**68**	63	**5**
R-373	Res.	B	1	76 Dawley Dr	56	55	1
R-374	Res.	B	1	120 Dawley Dr	**77**	64	**13**
R-375	Res.	B	1	24 Kennerly Dr	61	61	0
R-376	Res.	B	1	6077 Asheville Hwy	62	61	1
R-377	Res.	B	1	6075 Asheville Hwy	58	57	1
R-378	Res.	B	1	6073 Asheville Hwy	62	62	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							4

🟥 **Noise Level Impact**

🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW5.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 8 **# BENEFITS -** 4 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 5,226 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW5.3

Location: NW5.3 is located along I-26 westbound edge of shoulder beginning just north of the Butler Bridge Road and continuing approximately 420 feet in the northwest direction. This noise wall provides abatement for residences on Hope Opal Lane. An additional noise wall NW5.2, located just south of Butler Bridge Road, was considered to provide abatement for residences in this area as well, but was found not to provide any significant noise level reduction for impacted receptors.

Dimensions: Length = 420 ft., Avg. Height = 11 ft., Quantity = 4,749 ft^2
Impacts: 14
Benefits: 4
Quantity / Benefit: 1,187 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 4

This noise wall does meet feasibility and reasonableness criteria.

Table D-13: Noise Wall –NW5.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-379	Res.	B	1	46 Hope Opal Ln	R/W	R/W	R/W
R-380	Res.	B	1	38 Hope Opal Ln	R/W	R/W	R/W
R-381	Res.	B	1	34 Hope Opal Ln	77	72	5
R-382	Res.	B	1	28 Hope Opal Ln	77	71	6
R-383	Res.	B	1	22 Hope Opal Ln	76	69	7
R-384	Res.	B	1	14 Hope Opal Ln	74	69	5
R-385	Res.	B	1	41 Hope Opal Ln	69	67	2
R-386	Res.	B	1	65 Hope Opal Ln	68	67	1
R-387	Res.	B	1	23 Hope Opal Ln	65	64	1
R-388	Res.	B	1	73 Hope Opal Ln	67	67	0
R-389	Res.	B	1	9 Hope Opal Ln	65	64	1
R-390	Res.	B	1	120 S Thomas St	71	71	0
R-391	Res.	B	1	60 Jim Mills Dr	69	69	0
R-392	Res.	B	1	52 Jim Mills Dr	69	68	1
R-393	Res.	B	1	36 Jim Mills Dr	67	67	0
R-394	Res.	B	1	20 Jim Mills Dr	66	66	0
R-395	Res.	B	1	109 S Thomas St	66	66	0
R-396	Res.	B	1	112 S Thomas St	66	66	0
R-397	Res.	B	1	98 S Thomas St	64	63	1
R-398	Res.	B	1	41 Lantern Walk Ln	65	65	0
R-399	Res.	B	1	42 Lantern Walk Ln	63	63	0

Table D-13: Noise Wall –NW5.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-400	Res.	B	1	33 Jim Mills Dr	63	62	1
R-401	Res.	B	1	23 Lantern Walk Ln	65	65	0
R-402	Res.	B	1	38 S Thomas St	63	63	0
R-403	Res.	B	1	55 Darity Rd	62	62	0
R-404	Res.	B	1	75 Darity Rd	62	62	0
R-405	Res.	B	1	11 Collins Rd	62	62	0
R-406	Res.	B	1	21 Collins Rd	63	62	1
R-407	Res.	B	1	51 Collins Rd	62	62	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							4

🟥	🟩
Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW5.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 14 **# BENEFITS -** 4 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 1,187 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	YES

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	YES
3.	Is the noise wall likely?	YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW5.4

Location: NW5.4 is located south of Fanning Bridge Road along I-26 westbound beginning near the rest area south of Wildwood Circle and continuing approximately 1,560 feet in the northwest direction. This noise wall transitions from the edge of shoulder along the I-26 westbound on-ramp from the rest area to the top of a cut section and provides abatement for residences along Wildwood Circle. An additional noise wall NW5.5, located just north of Fanning Bridge Road, was considered to provide abatement for residences in this area as well, but was found not to provide any significant noise level reduction for impacted receptors.

Dimensions: Length = 1,560 ft., Avg. Height = 19 ft., Quantity = 30,116 ft^2
Impacts: 14
Benefits: 15
Quantity / Benefit: 2,008 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 14

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-14: Noise Wall –NW5.4- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-409	Res.	B	1	31 Wildwood Cir	59	57	2
R-410	Res.	B	1	33 Wildwood Cir	60	58	2
R-411	Res.	B	1	35 Wildwood Cir	64	59	**5**
R-412	Res.	B	1	37 Wildwood Cir	**68**	61	**7**
R-413	Res.	B	1	39 Wildwood Cir	**71**	61	**10**
R-414	Res.	B	1	41 Wildwood Cir	**75**	62	**13**
R-415	Res.	B	1	45 Wildwood Cir	**75**	63	**12**
R-416	Res.	B	1	47 Wildwood Cir	**75**	63	**12**
R-417	Res.	B	1	49 Wildwood Cir	**76**	64	**12**
R-418	Res.	B	1	51 Wildwood Cir	**77**	65	**12**
R-419	Res.	B	1	53 Wildwood Cir	**76**	65	**11**
R-420	Res.	B	1	55 Wildwood Cir	**74**	64	**10**
R-421	Res.	B	1	57 Wildwood Cir	**67**	61	**6**
R-422	Place of Worship	D	1	1291 Fanning Bridge Rd	42	40	2
R-423	Res.	B	1	59 Wildwood Cir	65	61	4
R-424	Res.	B	1	61 Wildwood Cir	63	60	3
R-425	Res.	B	1	63 Wildwood Cir	62	59	3
R-426	Res.	B	1	65 Wildwood Cir	61	60	1

Table D-14: Noise Wall –NW5.4- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-427	Res.	B	1	67 Wildwood Cir	62	61	1
R-428	Res.	B	1	32 Wildwood Cir	54	52	2
R-429	Res.	B	1	34 Wildwood Cir	57	53	4
R-430	Res.	B	1	36 Wildwood Cir	61	57	4
R-431	Res.	B	1	38 Wildwood Cir	**67**	62	**5**
R-432	Res.	B	1	48 Wildwood Cir	**68**	62	**6**
R-433	Res.	B	1	50 Wildwood Cir	**67**	61	**6**
R-434	Res.	B	1	52 Wildwood Cir	**66**	59	**7**
R-435	Res.	B	1	54 Wildwood Cir	61	57	4
R-436	Res.	B	1	56 Wildwood Cir	59	55	4
R-437	Res.	B	1	58 Wildwood Cir	53	52	1
R-438	Res.	B	1	60 Wildwood Cir	56	55	1
R-439	Res.	B	1	62 Wildwood Cir	57	56	1
R-440	Res.	B	1	64 Wildwood Cir	57	56	1
R-441	Res.	B	1	66 Wildwood Cir	58	58	0
R-442	Res.	B	1	21 Wildwood Ln	53	52	1
R-443	Res.	B	1	20 Wildwood Ln	60	57	3
R-444	Res.	B	1	18 Wildwood Ln	55	53	2
R-445	Res.	B	1	16 Wildwood Ln	55	52	3
R-446	Res.	B	1	14 Wildwood Ln	53	51	2
R-447	Res.	B	1	12 Wildwood Ln	53	51	2
R-448	Res.	B	1	10 Wildwood Ln	50	48	2
R-449	Res.	B	1	8 Wildwood Ln	54	52	2
R-450	Res.	B	1	6 Wildwood Ln	56	56	0
R-451	Res.	B	1	4 Wildwood Ln	57	57	0
R-452	Res.	B	1	25 Norman Rd	59	59	0
R-453	Res.	B	1	27 Norman Rd	59	59	0
R-454	Res.	B	1	29 Norman Rd	58	57	1
R-455	Res.	B	1	26 Norman Rd	57	56	1
R-456	Res.	B	1	92 Underwood Rd	63	63	0
R-457	Res.	B	1	5 Piney Dr	61	61	0
R-458	Res.	B	1	6 Piney Dr	58	58	0
R-459	Res.	B	1	15 Hickory Dr	57	57	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							15
					Noise Level Impact		**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW5.4 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 14 **# BENEFITS -** 15 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☑ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,008 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW6.1

Location: NW6.1 begins south of Glenn Bridge Road along I-26 westbound and continues approximately 2,520 feet to the northwest, ending between New Rockwood Road and Mahogany Road. It generally follows the top of the cut section but transitions to edge of shoulder near Glenn Bridge Road, and the portion of the wall along the I-26 westbound bridge over Glenn Bridge Road is on structure. This noise wall provides abatement for residences in the Hunter's Trace neighborhood.

Dimensions: Length = 2,520 ft., Avg. Height = 20 ft., Quantity = 49,221 ft^2
Impacts: 66
Benefits: 18
Quantity / Benefit: 2,735 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 17

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-15: Noise Wall –NW6.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-464	Res.	B	1	1 101 Flycatcher Way	65	64	1
R-465	Res.	B	1	1 201 Flycatcher Way	**66**	**66**	0
R-466	Res.	B	1	1 301 Flycatcher Way	**66**	**66**	0
R-467	Res.	B	1	1 102 Flycatcher Way	**66**	**66**	0
R-468	Res.	B	1	1 202 Flycatcher Way	**67**	**67**	0
R-469	Res.	B	1	1 302 Flycatcher Way	**68**	**68**	0
R-470	Res.	B	1	1 103 Flycatcher Way	**66**	**66**	0
R-471	Res.	B	1	1 203 Flycatcher Way	**67**	**67**	0
R-472	Res.	B	1	1 303 Flycatcher Way	**69**	**68**	1
R-473	Res.	B	1	1 106 Flycatcher Way	**66**	65	1
R-474	Res.	B	1	1 206 Flycatcher Way	**67**	**67**	0
R-475	Res.	B	1	1 306 Flycatcher Way	**68**	**68**	0
R-476	Res.	B	1	1 107 Flycatcher Way	65	65	0
R-477	Res.	B	1	1 207 Flycatcher Way	**67**	**67**	0
R-478	Res.	B	1	1 307 Flycatcher Way	**68**	**68**	0
R-479	Res.	B	1	1 108 Flycatcher Way	56	56	0
R-480	Res.	B	1	1 208 Flycatcher Way	61	60	1
R-481	Res.	B	1	1 308 Flycatcher Way	64	63	1
R-482	Res.	B	1	13 101 Flycatcher Way	54	53	1
R-483	Res.	B	1	13 201 Flycatcher Way	57	56	1

Table D-15: Noise Wall –NW6.1- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative							
Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-484	Res.	B	1	13 301 Flycatcher Way	59	59	0
R-485	Res.	B	1	13 102 Flycatcher Way	60	60	0
R-486	Res.	B	1	13 202 Flycatcher Way	65	64	1
R-487	Res.	B	1	13 302 Flycatcher Way	**66**	**66**	0
R-488	Res.	B	1	13 103 Flycatcher Way	60	60	0
R-489	Res.	B	1	13 203 Flycatcher Way	64	63	1
R-490	Res.	B	1	13 303 Flycatcher Way	**66**	65	1
R-491	Res.	B	1	13 106 Flycatcher Way	58	58	0
R-492	Res.	B	1	13 206 Flycatcher Way	63	62	1
R-493	Res.	B	1	13 306 Flycatcher Way	**66**	65	1
R-494	Res.	B	1	13 107 Flycatcher Way	56	56	0
R-495	Res.	B	1	13 207 Flycatcher Way	61	61	0
R-496	Res.	B	1	13 307 Flycatcher Way	65	64	1
R-497	Res.	B	1	13 108 Flycatcher Way	57	56	1
R-498	Res.	B	1	13 208 Flycatcher Way	58	57	1
R-499	Res.	B	1	13 308 Flycatcher Way	61	60	1
R-500	Res.	B	1	12 101 Flycatcher Way	57	57	0
R-501	Res.	B	1	12 201 Flycatcher Way	58	58	0
R-502	Res.	B	1	12 301 Flycatcher Way	59	58	1
R-503	Res.	B	1	12 102 Flycatcher Way	58	58	0
R-504	Res.	B	1	12 202 Flycatcher Way	62	62	0
R-505	Res.	B	1	12 302 Flycatcher Way	65	64	1
R-506	Res.	B	1	12 103 Flycatcher Way	60	59	1
R-507	Res.	B	1	12 203 Flycatcher Way	64	64	0
R-508	Res.	B	1	12 303 Flycatcher Way	**66**	**66**	0
R-509	Res.	B	1	12 106 Flycatcher Way	61	61	0
R-510	Res.	B	1	12 206 Flycatcher Way	65	65	0
R-511	Res.	B	1	12 306 Flycatcher Way	**67**	**66**	1
R-512	Res.	B	1	12 107 Flycatcher Way	62	62	0
R-513	Res.	B	1	12 207 Flycatcher Way	**66**	65	1
R-514	Res.	B	1	12 307 Flycatcher Way	**67**	**66**	1
R-515	Res.	B	1	12 108 Flycatcher Way	58	58	0
R-516	Res.	B	1	12 208 Flycatcher Way	62	62	0
R-517	Res.	B	1	12 308 Flycatcher Way	65	64	1
R-518	Res.	B	1	11 101 Flycatcher Way	59	58	1
R-519	Res.	B	1	11 201 Flycatcher Way	63	62	1

Table D-15: Noise Wall –NW6.1- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-520	Res.	B	1	11 301 Flycatcher Way	65	64	1
R-521	Res.	B	1	11 102 Flycatcher Way	64	64	0
R-522	Res.	B	1	11 202 Flycatcher Way	67	66	1
R-523	Res.	B	1	11 302 Flycatcher Way	68	67	1
R-524	Res.	B	1	11 103 Flycatcher Way	64	63	1
R-525	Res.	B	1	11 203 Flycatcher Way	66	65	1
R-526	Res.	B	1	11 303 Flycatcher Way	67	66	1
R-527	Res.	B	1	11 106 Flycatcher Way	63	62	1
R-528	Res.	B	1	11 206 Flycatcher Way	66	65	1
R-529	Res.	B	1	11 306 Flycatcher Way	67	66	1
R-530	Res.	B	1	11 107 Flycatcher Way	63	61	2
R-531	Res.	B	1	11 207 Flycatcher Way	65	64	1
R-532	Res.	B	1	11 307 Flycatcher Way	66	65	1
R-533	Res.	B	1	11 108 Flycatcher Way	55	53	2
R-534	Res.	B	1	11 208 Flycatcher Way	55	54	1
R-535	Res.	B	1	11 308 Flycatcher Way	57	55	2
R-536	Res.	B	1	10 101 Flycatcher Way	56	55	1
R-537	Res.	B	1	10 201 Flycatcher Way	59	57	2
R-538	Res.	B	1	10 301 Flycatcher Way	61	59	2
R-539	Res.	B	1	10 102 Flycatcher Way	64	63	1
R-540	Res.	B	1	10 202 Flycatcher Way	66	64	2
R-541	Res.	B	1	10 302 Flycatcher Way	67	65	2
R-542	Res.	B	1	10 103 Flycatcher Way	64	63	1
R-543	Res.	B	1	10 203 Flycatcher Way	66	65	1
R-544	Res.	B	1	10 303 Flycatcher Way	67	65	2
R-545	Res.	B	1	10 106 Flycatcher Way	65	63	2
R-546	Res.	B	1	10 206 Flycatcher Way	67	65	2
R-547	Res.	B	1	10 306 Flycatcher Way	67	65	2
R-548	Res.	B	1	10 107 Flycatcher Way	65	63	2
R-549	Res.	B	1	10 207 Flycatcher Way	67	65	2
R-550	Res.	B	1	10 307 Flycatcher Way	67	65	2
R-551	Res.	B	1	10 108 Flycatcher Way	63	61	2
R-552	Res.	B	1	10 208 Flycatcher Way	64	62	2
R-553	Res.	B	1	10 308 Flycatcher Way	64	62	2
R-554	Res.	B	1	9 104 Flycatcher Way	55	55	0
R-555	Res.	B	1	9 204 Flycatcher Way	57	56	1

Table D-15: Noise Wall –NW6.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-556	Res.	B	1	9 304 Flycatcher Way	59	58	1
R-557	Res.	B	1	9 101 Flycatcher Way	64	62	2
R-558	Res.	B	1	9 201 Flycatcher Way	65	63	2
R-559	Res.	B	1	9 301 Flycatcher Way	66	64	2
R-560	Res.	B	1	9 102 Flycatcher Way	65	63	2
R-561	Res.	B	1	9 202 Flycatcher Way	66	64	2
R-562	Res.	B	1	9 302 Flycatcher Way	67	65	2
R-563	Res.	B	1	9 103 Flycatcher Way	64	62	2
R-564	Res.	B	1	9 203 Flycatcher Way	65	63	2
R-565	Res.	B	1	9 303 Flycatcher Way	66	64	2
R-566	Res.	B	1	9 106 Flycatcher Way	63	61	2
R-567	Res.	B	1	9 206 Flycatcher Way	65	62	3
R-568	Res.	B	1	9 306 Flycatcher Way	65	63	2
R-569	Res.	B	1	9 107 Flycatcher Way	63	60	3
R-570	Res.	B	1	9 207 Flycatcher Way	64	62	2
R-571	Res.	B	1	9 307 Flycatcher Way	65	63	2
R-572	Res.	B	1	428 Rockwood Rd	68	64	4
R-573	Res.	B	1	26 Foxberry Dr	63	59	4
R-574	Res.	B	1	24 Foxberry Dr	65	61	4
R-575	Res.	B	1	22 Foxberry Dr	68	62	6
R-576	Res.	B	1	18 Foxberry Dr	69	63	6
R-577	Res.	B	1	16 Foxberry Dr	70	64	6
R-578	Res.	B	1	14 Foxberry Dr	72	65	7
R-579	Res.	B	1	10 Foxberry Dr	75	66	9
R-580	Res.	B	1	8 Foxberry Dr	76	67	9
R-581	Res.	B	1	4 Foxberry Dr	76	66	10
R-582	Res.	B	1	27 Foxberry Dr	58	57	1
R-583	Res.	B	1	25 Foxberry Dr	62	60	2
R-584	Res.	B	1	19 Foxberry Dr	58	57	1
R-585	Res.	B	1	15 Foxberry Dr	68	64	4
R-586	Res.	B	1	9 Foxberry Dr	70	65	5
R-587	Res.	B	1	7 Foxberry Dr	71	64	7
R-588	Res.	B	1	5 Foxberry Dr	71	62	9
R-589	Res.	B	1	3 Foxberry Dr	70	63	7
R-590	Res.	B	1	54 Winding Oak Dr	57	55	2
R-591	Res.	B	1	58 Winding Oak Dr	60	57	3

Table D-15: Noise Wall –NW6.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-592	Res.	B	1	62 Winding Oak Dr	63	60	3
R-593	Res.	B	1	66 Winding Oak Dr	67	63	4
R-594	Res.	B	1	63 Winding Oak Dr	65	62	3
R-595	Res.	B	1	57 Winding Oak Dr	63	58	5
R-596	Res.	B	1	53 Winding Oak Dr	58	54	4
R-597	Res.	B	1	47 Winding Oak Dr	58	55	3
R-598	Res.	B	1	37 Winding Oak Dr	59	55	4
R-599	Res.	B	1	31 Winding Oak Dr	60	58	2
R-600	Res.	B	1	27 Winding Oak Dr	61	59	2
R-601	Res.	B	1	102 Wood Glen Ct	60	59	1
R-602	Res.	B	1	106 Wood Glen Ct	63	61	2
R-603	Res.	B	1	110 Wood Glen Ct	61	59	2
R-604	Res.	B	1	114 Wood Glen Ct	67	61	6
R-605	Res.	B	1	118 Wood Glen Ct	74	71	3
R-606	Res.	B	1	109 Wood Glen Ct	74	71	3
R-607	Res.	B	1	105 Wood Glen Ct	67	65	2
R-608	Res.	B	1	15 Winding Oak Dr	66	64	2
R-609	Res.	B	1	9 Winding Oak Dr	66	64	2
R-610	Res.	B	1	5 Winding Oak Dr	66	63	3
R-611	Res.	B	1	1 Winding Oak Dr	67	62	5
R-612	Res.	B	1	169 New Rockwood Rd	69	62	7
R-613	Res.	B	1	173 New Rockwood Rd	73	64	9
R-614	Res.	B	1	177 New Rockwood Rd	76	68	8
R-615	Res.	B	1	168 New Rockwood Rd	74	63	11
R-616	Res.	B	1	167 New Rockwood Rd	69	66	3
R-617	Res.	B	1	22 Winding Oak Dr	61	60	1
R-618	Res.	B	1	18 Winding Oak Dr	64	63	1
R-619	Res.	B	1	14 Winding Oak Dr	61	61	0
R-620	Res.	B	1	10 Winding Oak Dr	61	60	1
R-621	Res.	B	1	6 Winding Oak Dr	61	61	0
R-622	Res.	B	1	2 Winding Oak Dr	64	61	3
R-623	Res.	B	1	151 New Rockwood Rd	58	58	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							18
						Noise Level Impact	**Benefited Receptor**

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NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW6.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 66 **# BENEFITS -** 18 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,735 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW7.1

Location: NW7.1 begins at the top of a cut section between Blue Ridge Parkway and NC 191 (Brevard Road) along I-26 westbound and transitions to edge of shoulder. This noise wall provides abatement for residences on Ferry Road.

Dimensions: Length = 1,380 ft., Avg. Height = 12 ft., Quantity = 16,613 ft^2
Impacts: 3
Benefits: 4
Quantity / Benefit: 4,153 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 3

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-16: Noise Wall –NW7.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-630	Res.	B	1	215 Ferry Rd	🟥 **66**	61	🟩 **5**
R-631	Res.	B	1	218 Ferry Rd	65	60	🟩 **5**
R-632	Res.	B	1	200 Ferry Rd	🟥 **70**	63	🟩 **7**
R-633	Res.	B	1	192 Ferry Rd	🟥 **70**	65	🟩 **5**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							4
					🟥 **Noise Level Impact**		🟩 **Benefited Receptor**

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NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW7.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 3 **# BENEFITS -** 4 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 4,153 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW7.2

Location: NW7.2 is located between NC 191 (Brevard Road) and Pond Road along I-26 westbound edge of shoulder. This noise wall provides abatement for residences on Dogwood Road.

Dimensions: Length = 1,440 ft., Avg. Height = 19 ft., Quantity = 27,090 ft^2
Impacts: 2
Benefits: 2
Quantity / Benefit: 13,545 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-17: Noise Wall –NW7.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-655	Res.	B	1	36 Dogwood Rd	**68**	62	**6**
R-656	Res.	B	1	50 Dogwood Rd	**71**	64	**7**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2

Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW7.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 2 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 13,545 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW8.1

Location: NW8.1 is located between NC 191 (Brevard Road) and Blue Ridge Parkway along I-26 eastbound edge of shoulder. This noise wall provides abatement for residences on Ferry Road.

Dimensions: Length = 660 ft., Avg. Height = 11 ft., Quantity = 6,901 ft^2
Impacts: 2
Benefits: 2
Quantity / Benefit: 3,451 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-18: Noise Wall –NW8.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-663	Res.	B	1	184 Ferry Rd	69	64	5
R-664	Res.	B	1	191 Ferry Rd	75	68	7
R-665	Res.	B	1	185 Ferry Rd	65	64	1
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2

🟥 **Noise Level Impact**
🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW8.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 2 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 3,451 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW9.1

Location: NW9.1 is located between NC 146 (Long Shoals Road) and Glenn Bridge Road along I-26 eastbound edge of shoulder. This noise wall provides abatement for residences on Bear Leah Trail, accessible via Glenn Bridge Road.

Dimensions: Length = 720 ft., Avg. Height = 10 ft., Quantity = 6,894 ft^2
Impacts: 3
Benefits: 3
Quantity / Benefit: 2,298 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 3

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-19: Noise Wall –NW9.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-667	Res.	B	1	40 Bear Leah Trl	77	70	7
R-668	Res.	B	1	38 Bear Leah Trl	78	71	7
R-669	Res.	B	1	36 Bear Leah Trl	73	68	5
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							3

🟥 **Noise Level Impact**
🟩 **Benefited Receptor**

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FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW9.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 3 **# BENEFITS -** 3 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,298 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW9.2

Location: NW9.2 begins approximately 840 feet north of Glenn Bridge Road along I-26 eastbound edge of shoulder and continues approximately 1,341 feet in the southeast direction. The portion of the wall along the I-26 eastbound bridge over Glenn Bridge Road is on structure. This noise wall provides abatement for residences on Glenn Bridge Road and Bear Leah Trail.

Dimensions: Length = 1,341 ft., Avg. Height = 25 ft., Quantity = 32,875 ft^2
Impacts: 3
Benefits: 0
Quantity / Benefit: N/A.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 0

This noise wall does not meet reasonableness criteria because exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor.

Table D-20: Noise Wall –NW9.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-670	Res.	B	1	16 Bear Leah Trl	**67**	63	4
R-671	Res.	B	1	404 Glenn Bridge Rd	**71**	**67**	4
R-672	Res.	B	1	406 Glenn Bridge Rd	**68**	64	4
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							0[1]

[1] Exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor to meet NCDOT reasonableness criteria.

🟥	🟩
Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW9.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 3 **# BENEFITS -** 0 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	NO
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	NO
2.	Is the quantity per benefited receptor of N/A square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	NO
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW9.3

Location: NW9.3 is located between Glenn Bridge Road and NC 280 (Airport Road) along I-26 eastbound edge of shoulder. This noise wall provides abatement for residences on Hidden Creek Drive, Nathan Drive and Wells Drive.

Dimensions: Length = 1,740 ft., Avg. Height = 18 ft., Quantity = 31,376 ft^2
Impacts: 23
Benefits: 21
Quantity / Benefit: 1,494 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 19

This noise wall does meet feasibility and reasonableness criteria.

Table D-21: Noise Wall –NW9.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-673	Res.	B	1	1 Hidden Creek Dr	70	61	9
R-674	Res.	B	1	3 Hidden Creek Dr	68	60	8
R-675	Res.	B	1	5 Hidden Creek Dr	69	65	4
R-676	Res.	B	1	7 Hidden Creek Dr	68	64	4
R-677	Res.	B	1	20 Hidden Creek Dr	67	59	8
R-678	Res.	B	1	12 Wells Dr	67	61	6
R-679	Res.	B	1	10 Hidden Creek Dr	69	64	5
R-680	Res.	B	1	13 Hidden Creek Dr	68	64	4
R-681	Res.	B	1	2 Hidden Creek Dr	69	60	9
R-682	Res.	B	1	1 Nathan Dr	68	59	9
R-683	Res.	B	1	5 Nathan Dr	68	60	8
R-684	Res.	B	1	105 Hidden Creek Rd	78	65	13
R-685	Res.	B	1	8 Nathan Dr	70	61	9
R-686	Res.	B	1	7 Nathan Dr	67	60	7
R-687	Res.	B	1	15 Nathan Dr	65	59	6
R-688	Res.	B	1	14 Wells Dr	68	62	6
R-689	Res.	B	1	9 Wells Dr	69	63	6
R-690	Res.	B	1	15 Wells Dr	68	63	5
R-691	Res.	B	1	17 Wells Dr	68	62	6
R-692	Res.	B	1	15 Hidden Creek Dr	67	63	4
R-693	Res.	B	1	17 Hidden Creek Dr	65	62	3
R-694	Res.	B	1	101 Hidden Creek Rd	72	62	10
R-695	Res.	B	1	10 Nathan Dr	67	60	7
R-696	Res.	B	1	12 Nathan Dr	63	59	4

Table D-21: Noise Wall –NW9.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-697	Res.	B	1	14 Nathan Dr	65	60	**5**
R-698	Res.	B	1	16 Nathan Dr	**67**	61	**6**
R-699	Res.	B	1	18 Hidden Creek Dr	**66**	60	**6**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							21

Noise Level Impact	**Benefited Receptor**

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NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW9.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 23 **# BENEFITS -** 21 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1. Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors? YES
2. Does topography negatively affect the proposed noise wall? NO
3. Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements? NO
4. Is there control of access in the vicinity of the proposed noise wall? YES

B. REASONABLENESS

1. Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor? YES
2. Is the quantity per benefited receptor of 1,494 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet? YES

C. NOISE WALL PRELIMINARY DECISION

1. Is the noise wall preliminarily feasible? YES
2. Is the noise wall preliminarily reasonable? YES
3. Is the noise wall likely? YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW10.1

Location: NW10.1 begins approximately 1,140 feet north of Butler Bridge Road along I-26 eastbound edge of shoulder and ends near the Butler Bridge Road bridge over I-26. This noise wall provides abatement for residences on Vaughn Circle.

Dimensions: Length = 1,140 ft., Avg. Height = 12 ft., Quantity = 13,828 ft^2
Impacts: 2
Benefits: 2
Quantity / Benefit: 6,914 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-22: Noise Wall –NW10.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-701	Res.	B	1	98 Vaughn Cir	**73**	65	**8**
R-702	Res.	B	1	91 Vaughn Cir	**67**	62	**5**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2

Noise Level Impact	**Benefited Receptor**

NCDOT NOISE WALL

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PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW10.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 2 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 6,914 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW11.1

Location: NW11.1 begins along the I-26 eastbound off-ramp to US 25 (Asheville Highway) edge of shoulder and continues approximately 780 feet in the southeast direction along Cuerton Place, ending prior to the Cuerton Place intersection with Asheville Highway. This noise wall provides abatement for residences on Cuerton Place and Alverson Lane.

Dimensions: Length = 780 ft., Avg. Height = 18 ft., Quantity = 13,690 ft^2
Impacts: 8
Benefits: 5
Quantity / Benefit: 2,738 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 4

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-23: Noise Wall –NW11.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-715	Res.	B	1	41 Bicknell Dr	62	62	0
R-716	Res.	B	1	68 C Ln	52	52	0
R-717	Res.	B	1	71 C Ln	51	51	0
R-718	Res.	B	1	65 C Ln	51	51	0
R-719	Res.	B	1	48 Cuerton Pl	67	67	0
R-720	Res.	B	1	26 Bicknell Dr	64	64	0
R-721	Res.	B	1	56 Cuerton Pl	64	63	1
R-722	Res.	B	1	72 Cuerton Pl	61	61	0
R-723	Res.	B	1	76 Cuerton Pl	63	62	1
R-724	Res.	B	1	78 Cuerton Pl	61	61	0
R-725	Res.	B	1	53 Cuerton Pl	66	64	2
R-726	Res.	B	1	51 Cuerton Pl	66	64	2
R-727	Res.	B	1	63 Cuerton Pl	64	62	2
R-728	Res.	B	1	61 Cuerton Pl	64	62	2
R-729	Res.	B	1	57 Cuerton Pl	65	63	2
R-730	Res.	B	1	59 Cuerton Pl	64	63	1
R-731	Res.	B	1	73 Cuerton Pl	63	61	2
R-732	Res.	B	1	71 Cuerton Pl	65	63	2
R-733	Res.	B	1	75 Cuerton Pl	65	64	1
R-734	Res.	B	1	77 Cuerton Pl	63	62	1
R-735	Res.	B	1	39 Cuerton Pl	68	63	5
R-736	Res.	B	1	34 Alverson Ln	59	56	3

Table D-23: Noise Wall –NW11.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-737	Res.	B	1	38 Alverson Ln	60	58	2
R-738	Res.	B	1	48 Alverson Ln	60	58	2
R-739	Res.	B	1	62 Alverson Ln	60	57	3
R-740	Res.	B	1	74 Alverson Ln	59	58	1
R-741	Res.	B	1	31 Cuerton Pl	**67**	60	**7**
R-742	Res.	B	1	30 Alverson Ln	59	57	2
R-743	Res.	B	1	24 Alverson Ln	63	58	**5**
R-744	Res.	B	1	16 Alverson Dr	**66**	60	**6**
R-745	Res.	B	1	53 Alverson Ln	**67**	62	**5**
R-746	Res.	B	1	13 Cuerton Pl	**67**	63	4
R-747	Res.	B	1	75 Cuerton Pl	61	60	1
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							5

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW11.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 8 **# BENEFITS -** 5 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,738 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW11.2

Location: NW11.2 is located just south of Naples Road along I-26 eastbound edge of shoulder beginning at the Naples Road bridge and continuing approximately 4,979 feet in the southeast direction. This noise wall provides abatement for residences along Old Naples Road, Canterbury Way, Oak Meadow Lane and Sujo Trail.

Dimensions: Length = 4,979 ft., Avg. Height = 20 ft., Quantity = 98,198 ft^2
Impacts: 18
Benefits: 22
Quantity / Benefit: 4,464 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 18

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-24: Noise Wall –NW11.2- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-749	Res.	B	1	73 Pack Rd	59	59	0
R-750	Res.	B	1	83 Naples Glenn Trl	72	67	5
R-751	Res.	B	1	168 S Naples Rd	59	58	1
R-752	Res.	B	1	288 Old Naples Rd	67	59	8
R-753	Res.	B	1	284 Old Naples Rd	68	59	9
R-754	Res.	B	1	15 Canterbury Way	79	64	15
R-755	Res.	B	1	41 Canterbury Way	71	61	10
R-756	Res.	B	1	118 Canterbury Way	71	59	12
R-757	Res.	B	1	121 Canterbury Hill Ln	72	64	8
R-758	Res.	B	1	304 Canterbury Way	69	63	6
R-759	Res.	B	1	328 Canterbury Way	66	61	5
R-760	Res.	B	1	44 Canterbury Hill Ln	72	61	11
R-761	Res.	B	1	238 Canterbury Way	70	60	10
R-762	Res.	B	1	299 Canterbury Way	68	62	6
R-763	Res.	B	1	275 Canterbury Way	62	58	4
R-764	Res.	B	1	269 Canterbury Way	64	58	6
R-765	Res.	B	1	181 Canterbury Way	61	55	6
R-766	Res.	B	1	255 Canterbury Way	67	58	9
R-767	Res.	B	1	80 Oak Meadow Ln	68	58	10
R-768	Res.	B	1	73 Oak Meadow Ln	68	59	9
R-769	Res.	B	1	17 Sujo Trl	69	61	8
R-770	Res.	B	1	14 Sujo Trl	65	60	5

Table D-24: Noise Wall –NW11.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-771	Res.	B	1	157 Oak Meadow Ln	59	52	**7**
R-772	Res.	B	1	40 Sujo Trl	**67**	61	**6**
R-773	Res.	B	1	281 High Hills Rd	**66**	61	**5**
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							22

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW11.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 18 **# BENEFITS -** 22 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 4,464 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW12.1

Location: NW12.1 is located between Brookside Camp Road and Clear Creek Road along I-26 eastbound near Alex Cove Drive. This noise wall begins at the top of a cut section but transitions to the edge of shoulder and provides abatement for residences along Hyder Farm Road and Alex Cove Drive.

Dimensions: Length = 840 ft., Avg. Height = 10 ft., Quantity = 8,700 ft^2
Impacts: 3
Benefits: 3
Quantity / Benefit: 2,900 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 3

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-25: Noise Wall –NW12.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-777	Res.	B	1	619 Hyder Farm Rd	🟥 **75**	🟥 **68**	🟩 **7**
R-778	Res.	B	1	104 Alex Cove Dr	🟥 **70**	65	🟩 **5**
R-779	Res.	B	1	507 Hyder Farm Rd	🟥 **70**	65	🟩 **5**
R-780	Res.	B	1	110 Alex Cove Dr	62	60	2
R-781	Res.	B	1	114 Alex Cove Dr	59	57	2
R-782	Res.	B	1	307 Hyder Farm Rd	65	65	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							3

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

To be used with Traffic Noise Reports only

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW12.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 3 **# BENEFITS -** 3 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,900 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW12.2

Location: NW12.2 is located along the I-26 eastbound off-ramp to US 64 westbound edge of shoulder. This noise wall provides abatement for residences along Lake Club Circle, Carolina Village Road and Lake Spur Drive.

Dimensions: Length = 1,140 ft., Avg. Height = 20 ft., Quantity = 22,287 ft^2
Impacts: 5
Benefits: 6
Quantity / Benefit: 3,715 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 5

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-26: Noise Wall –NW12.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-813	Res.	B	1	10 Tanager Trail	57	57	0
R-814	Res.	B	1	14 Tanager Trail	54	54	0
R-815	Res.	B	1	12 Tanager Trail	51	50	1
R-816	Res.	B	1	24 White Quail Trail	57	57	0
R-817	Res.	B	1	22 White Quail Trail	62	59	3
R-818	Res.	B	1	20 White Quail Trail	61	59	2
R-819	Res.	B	1	21 White Quail Trail	63	60	3
R-820	Res.	B	1	23 White Quail Trail	60	58	2
R-821	Res.	B	1	25 White Quail Trail	53	51	2
R-822	Res.	B	1	418 Carolina Village Rd	**76**	**67**	**9**
R-823	Res.	B	1	30 Lake Spur Dr	54	52	2
R-824	Res.	B	1	34 Lake Spur Dr	54	52	2
R-825	Res.	B	1	32 Lake Spur Dr	52	50	2
R-826	Res.	B	1	38 Lake Spur Dr	57	55	2
R-827	Res.	B	1	36 Lake Spur Dr	60	57	3
R-828	Res.	B	1	40 Lake Spur Dr	55	53	2
R-829	Res.	B	1	35 Lake Spur Dr	64	59	**5**
R-830	Res.	B	1	37 Lake Spur Dr	**69**	63	**6**
R-831	Res.	B	1	39 Lake Spur Dr	**69**	64	**5**
R-832	Res.	B	1	348 Carolina Village Rd	**76**	**69**	**7**
R-833	Res.	B	1	346 Carolina Village Rd	**73**	**68**	**5**
R-834	Res.	B	1	108-A Lake Club Cir	55	53	2
R-835	Res.	B	1	108-B Lake Club Cir	56	53	3

Table D-26: Noise Wall –NW12.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-836	Res.	B	1	108-C Lake Club Cir	56	53	3
R-837	Res.	B	1	108-D Lake Club Cir	56	54	2
R-838	Res.	B	1	108-E Lake Club Cir	57	54	3
R-839	Res.	B	1	108-F Lake Club Cir	58	55	3
R-840	Res.	B	1	103-F Lake Club Cir	50	50	0
R-841	Res.	B	1	103-E Lake Club Cir	50	50	0
R-842	Res.	B	1	103-D Lake Club Cir	50	50	0
R-843	Res.	B	1	103-C Lake Club Cir	50	50	0
R-844	Res.	B	1	103-B Lake Club Cir	50	50	0
R-845	Res.	B	1	103-A Lake Club Cir	53	51	2
R-846	Res.	B	1	45-D Lake Club Cir	54	53	1
R-847	Res.	B	1	45-C Lake Club Cir	54	54	0
R-848	Res.	B	1	45-B Lake Club Cir	54	53	1
R-849	Res.	B	1	45-A Lake Club Cir	53	53	0
R-850	Res.	B	1	62-A Lake Club Cir	57	56	1
R-851	Res.	B	1	62-B Lake Club Cir	54	53	1
R-852	Res.	B	1	62-C Lake Club Cir	54	54	0
R-853	Res.	B	1	62-D Lake Club Cir	55	54	1
R-854	Res.	B	1	30-A Lake Club Cir	55	54	1
R-855	Res.	B	1	30-B Lake Club Cir	55	55	0
R-856	Res.	B	1	30-C Lake Club Cir	55	55	0
R-857	Res.	B	1	30-D Lake Club Cir	56	56	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							6

Noise Level Impact	Benefited Receptor

To be used with Traffic Noise Reports only

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW12.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 5 **# BENEFITS -** 6 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 3,715 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW13.1

Location: NW13.1 begins just south of Camp Pinewood between US 64 and Dana Road along I-26 eastbound and continues approximately 2,160 feet in the southeast direction. It generally follows the top of a cut section but has one transition to edge of shoulder. This noise wall provides abatement for residences on West Prince Road and Fairbanks Lane, as well as a few residences accessible via Dana Road.

Dimensions: Length = 2,160 ft., Avg. Height = 13 ft., Quantity = 28,123 ft^2
Impacts: 10
Benefits: 11
Quantity / Benefit: 2,557 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 10

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-27: Noise Wall –NW13.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
R-860	Res.	B	1	305 Prince Rd	74	66	8
R-861	Res.	B	1	77 Fairbanks Ln	73	65	8
R-862	Res.	B	1	69 Fairbanks Ln	66	61	5
R-863	Res.	B	1	47 Fairbanks Ln	63	59	4
R-864	Res.	B	1	317 W Prince Rd	61	58	3
R-865	Res.	B	1	311 W Prince Rd	63	60	3
R-866	Res.	B	1	301 W Prince Rd	62	60	2
R-867	Res.	B	1	323 W Prince Rd	66	61	5
R-868	Res.	B	1	325 W Prince Rd	74	63	11
R-869	Res.	B	1	337 W Prince Rd	74	65	9
R-870	Res.	B	1	333 W Prince Rd	73	63	10
R-871	Res.	B	1	324 W Prince Rd	58	56	2
R-872	Res.	B	1	330 W Prince Rd	64	59	5
R-873	Res.	B	1	334 W Prince Rd	59	56	3
R-874	Res.	B	1	398 W Prince Rd	59	55	4
R-875	Res.	B	1	341 W Prince Rd	70	63	7
R-876	Res.	B	1	365 W Prince Rd	68	63	5
R-877	Res.	B	1	373 W Prince Rd	65	62	3
R-878	Res.	B	1	381 W Prince Rd	64	62	2
R-879	Res.	B	1	655 Dana Rd	62	60	2
R-880	Res.	B	1	665 Dana Rd	79	71	8

Table D-27: Noise Wall –NW13.1- Performance Without Barrier and With Barrier Noise Levels Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	Use	NAC	D.U.s	Address	Build	With Barrier	NLR
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							11
					🟥 Noise Level Impact		🟩 Benefited Receptor

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW13.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 10 **# BENEFITS -** 11 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 2,557 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW13.2

Location: NW13.2 begins just south of Dana Road along I-26 eastbound at the top of a cut section and transitions to edge of shoulder. This noise wall continues approximately 2,040 feet and provides abatement for residences on Meadowlark Lane and Papa Joes Way. An alternate alignment NW13.2-Alt, which was located along I-26 eastbound edge of shoulder near Dana Road rather than at the top of a cut section, was considered since this cut section does not represent a significant change in elevation compared to I-26, but no feasible and reasonable alternative could be found for this alignment to produce the same number of benefits as the original alignment.

Dimensions: Length = 2,040 ft., Avg. Height = 17 ft., Quantity = 34,418 ft^2
Impacts: 18
Benefits: 23
Quantity / Benefit: 1,496 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 11

This noise wall does meet feasibility and reasonableness criteria.

Table D-28: Noise Wall –NW13.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-881	Res.	B	1	102 Papa Joes Way	64	60	4
R-882	Res.	B	1	104 Papa Joes Way	62	59	3
R-883	Res.	B	1	101 Papa Joes Way	**68**	60	**8**
R-884	Res.	B	1	2 Meadowlark Ln	**70**	61	**9**
R-885	Res.	B	1	4 Meadowlark Ln	**68**	60	**8**
R-886	Res.	B	1	6 Meadowlark Ln	**67**	60	**7**
R-887	Res.	B	1	8 Meadowlark Ln	65	59	**6**
R-888	Res.	B	1	10 Meadowlark Ln	65	59	**6**
R-889	Res.	B	1	12 Meadowlark Ln	63	61	2
R-890	Res.	B	1	14 Meadowlark Ln	63	58	**5**
R-891	Res.	B	1	18 Meadowlark Ln	61	57	4
R-892	Res.	B	1	20 Meadowlark Ln	61	57	4
R-893	Res.	B	1	24 Meadowlark Ln	60	57	3
R-894	Res.	B	1	26 Meadowlark Ln	61	57	4
R-895	Res.	B	1	28 Meadowlark Ln	60	56	4
R-896	Res.	B	1	30 Meadowlark Ln	60	56	4
R-897	Res.	B	1	32 Meadowlark Ln	59	56	3
R-898	Res.	B	1	3 Meadowlark Ln	**73**	62	**11**
R-899	Res.	B	1	5 Meadowlark Ln	**72**	61	**11**

Table D-28: Noise Wall –NW13.2- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-900	Res.	B	1	9 Meadowlark Ln	**68**	60	**8**
R-901	Res.	B	1	11 Meadowlark Ln	**68**	60	**8**
R-902	Res.	B	1	13 Meadowlark Ln	**66**	59	**7**
R-903	Res.	B	1	15 Meadowlark Ln	65	59	**6**
R-904	Res.	B	1	17 Meadowlark Ln	65	60	**5**
R-905	Res.	B	1	19 Meadowlark Ln	64	59	**5**
R-906	Res.	B	1	21 Meadowlark Ln	64	59	**5**
R-907	Res.	B	1	23 Meadowlark Ln	64	59	**5**
R-908	Res.	B	1	27 Meadowlark Ln	64	59	**5**
R-909	Res.	B	1	29 Meadowlark Ln	64	59	**5**
R-910	Res.	B	1	33 Meadowlark Ln	63	58	**5**
R-911	Res.	B	1	35 Meadowlark Ln	62	57	**5**
R-912	Res.	B	1	37 Meadowlark Ln	62	59	3
R-913	Res.	B	1	41 Meadowlark Ln	61	58	3
R-914	Res.	B	1	39 Meadowlark Ln	**74**	**69**	**5**
R-915	Res.	B	1	40 Meadowlark Ln	**66**	61	**5**
R-916	Res.	B	1	51 Orchard Park Rd	64	61	3
R-917	Res.	B	1	64 Orchard Park Rd	**66**	63	3
R-918	Res.	B	1	69 Orchard Park Rd	65	62	3
R-919	Res.	B	1	72 Orchard Park Rd	**67**	65	2
R-920	Res.	B	1	121 Friendship Ln	**69**	**68**	1
R-921	Res.	B	1	111 Friendship Ln	**68**	**66**	2
R-922	Res.	B	1	125 Friendship Ln	**66**	**66**	0
R-923	Res.	B	1	16 Town View Ct	64	63	1
R-924	Res.	B	1	701 Tracy Grove Rd	**72**	**72**	0
R-925	Res.	B	1	703 Tracy Grove Rd	**68**	**68**	0
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							23

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

To be used with Traffic Noise Reports only

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW13.2 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 18 **# BENEFITS -** 23 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 1,496 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	YES

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	YES
3.	Is the noise wall likely?	YES

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW13.3

Location: NW13.3 begins approximately 500 feet south of Tracy Grove Road along I-26 eastbound edge of shoulder and continues approximately 4,080 feet in the southeast direction. This noise wall provides abatement for residences on South Allen Road, Carroll Oaks Drive, East New Hope Road and Merry Oaks Lane.

Dimensions: Length = 4,080 ft., Avg. Height = 16 ft., Quantity = 65,092 ft^2
Impacts: 12
Benefits: 16
Quantity / Benefit: 4,068 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 12

This noise wall does not meet reasonableness criteria because the quantity per benefit exceeds the allowable quantity per benefit.

Table D-29: Noise Wall –NW13.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					Predicted Noise Levels, $L_{eq(h)}$ (dB(A))		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-926	Res.	B	1	740 S Allen Rd	78	67	11
R-927	Res.	B	1	731 S Allen Rd	70	64	6
R-928	Res.	B	1	727 S Allen Rd	69	62	7
R-929	Comm. Center	C	1	722 S Allen Rd	77	67	10
R-930	Res.	B	1	973 E New Hope Rd	61	58	3
R-931	Res.	B	1	983 E New Hope Rd	61	58	3
R-932	Res.	B	1	999 E New Hope Rd	60	57	3
R-933	Res.	B	1	1075 E New Hope Rd	59	56	3
R-934	Res.	B	1	1108 E New Hope Rd	59	54	5
R-935	Res.	B	1	1103 E New Hope Rd	58	54	4
R-936	Res.	B	1	87 Carroll Oaks Dr	60	57	3
R-937	Res.	B	1	73 Carroll Oaks Dr	60	57	3
R-938	Res.	B	1	45 Carroll Oaks Dr	57	55	2
R-939	Res.	B	1	25 Carroll Oaks Dr	63	58	5
R-940	Res.	B	1	11 Carroll Oaks Dr	67	62	5
R-941	Res.	B	1	713 S Allen Rd	67	62	5
R-942	Res.	B	1	709 S Allen Rd	65	60	5
R-943	Res.	B	1	695 S Allen Rd	68	62	6
R-944	Res.	B	1	691 S Allen Rd	70	62	8
R-945	Res.	B	1	677 S Allen Rd	75	63	12
R-946	Baseball Field	C	1	401 E Campus Dr - Baseball Field	65	58	7

Table D-29: Noise Wall –NW13.3- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-947	Res.	B	1	92 Merry Oaks Ln	**72**	**67**	**5**
R-948	Res.	B	1	87 Merry Oaks Ln	62	60	2
R-949	Res.	B	1	630 S Allen Rd	**68**	63	**5**
R-950	Res.	B	1	600 S Allen Rd	**74**	**69**	**5**
R-951	Res.	B	1	580 S Allen Rd	60	59	1
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							16

🟥	🟩
Noise Level Impact	**Benefited Receptor**

To be used with Traffic Noise Reports only

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW13.3 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 12 **# BENEFITS -** 16 **NAC:** ☐ **A** ☑ **B** ☑ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	YES
2.	Is the quantity per benefited receptor of 4,068 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

NW14.1

Location: NW14.1 begins just south of Crest Road along the I-26 eastbound at the top of a cut section and transitions to edge of shoulder along the I-26 eastbound off-ramp to US 25 southbound. This noise wall provides abatement for residences on Hollyhock Court and Oak Grove Road.

Dimensions: Length = 2,820 ft., Avg. Height = 24 ft., Quantity = 66,593 ft^2
Impacts: 9
Benefits: 2
Quantity / Benefit: 33,297 ft^2.
Allowable Quantity / Benefit: 1,500 ft^2
NLR ≥ 5 dB(A) for Impacted Receptors: 2

This noise wall does not meet reasonableness criteria because exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor.

Table D-30: Noise Wall –NW14.1- Performance
Without Barrier and With Barrier Noise Levels
Hybrid 6/8-Lane Widening Alternative

Receptors					**Predicted Noise Levels, $L_{eq(h)}$ (dB(A))**		
ID#	**Use**	**NAC**	**D.U.s**	**Address**	**Build**	**With Barrier**	**NLR**
R-955	Res.	B	1	125 Victoria Springs Dr	65	62	3
R-956	Res.	B	1	149 Victoria Springs Dr	68	65	3
R-957	Res.	B	1	152 Victoria Springs Dr	70	66	4
R-958	Res.	B	1	134 Victoria Springs Dr	66	65	1
R-959	Res.	B	1	129 Hollyhock Ct	69	68	1
R-960	Res.	B	1	107 Hollyhock Ct	66	64	2
R-961	Res.	B	1	83 Hollyhock Ct	63	62	1
R-962	Res.	B	1	110 Hollyhock Ct	67	66	1
R-963	Res.	B	1	142 Hollyhock Ct	71	66	5
R-964	Res.	B	1	54 Hollyhock Ct	63	61	2
R-965	Res.	B	1	646 Oak Grove Rd	66	63	3
R-966	Res.	B	1	640 Oak Grove Rd	67	62	5
Predicted Hybrid 6/8-Lane Widening Alternative With Barrier Benefits							2[1]

[1] Exterior noise levels could not be reduced by at least 7 dB(A) for at least one (1) benefited receptor to meet NCDOT reasonableness criteria.

🟥 **Noise Level Impact**	🟩 **Benefited Receptor**

NCDOT NOISE WALL

FEASIBILITY & REASONABLENESS WORKSHEET

PROJECT - I-26 Widening **TIP# -** I-4400/I-4700

NOISE WALL # - NW14.1 **COUNTY(IES) -** Henderson and Buncombe

 # IMPACTS - 9 **# BENEFITS -** 2 **NAC:** ☐ **A** ☑ **B** ☐ **C** ☐ **D** ☐ **E**

A. FEASBILITY:

1.	Can a 5-dB(A) reduction in traffic noise levels be achieved for at least two impacted receptors?	YES
2.	Does topography negatively affect the proposed noise wall?	NO
3.	Does the proposed noise wall negatively affect property access, drainage, utilities or maintenance requirements?	NO
4.	Is there control of access in the vicinity of the proposed noise wall?	YES

B. REASONABLENESS

1.	Can a 7- dB(A) reduction in traffic noise levels be achieved for at least one benefited receptor?	NO
2.	Is the quantity per benefited receptor of 33,297 square feet less than the maximum allowable quantity per benefited receptor of 1,500 square feet?	NO

C. NOISE WALL PRELIMINARY DECISION

1.	Is the noise wall preliminarily feasible?	YES
2.	Is the noise wall preliminarily reasonable?	NO
3.	Is the noise wall likely?	NO

PREPARED BY: Trey Jordan **DATE PREPARED:** 6/5/2017

Appendix E

Predicted Traffic Volumes

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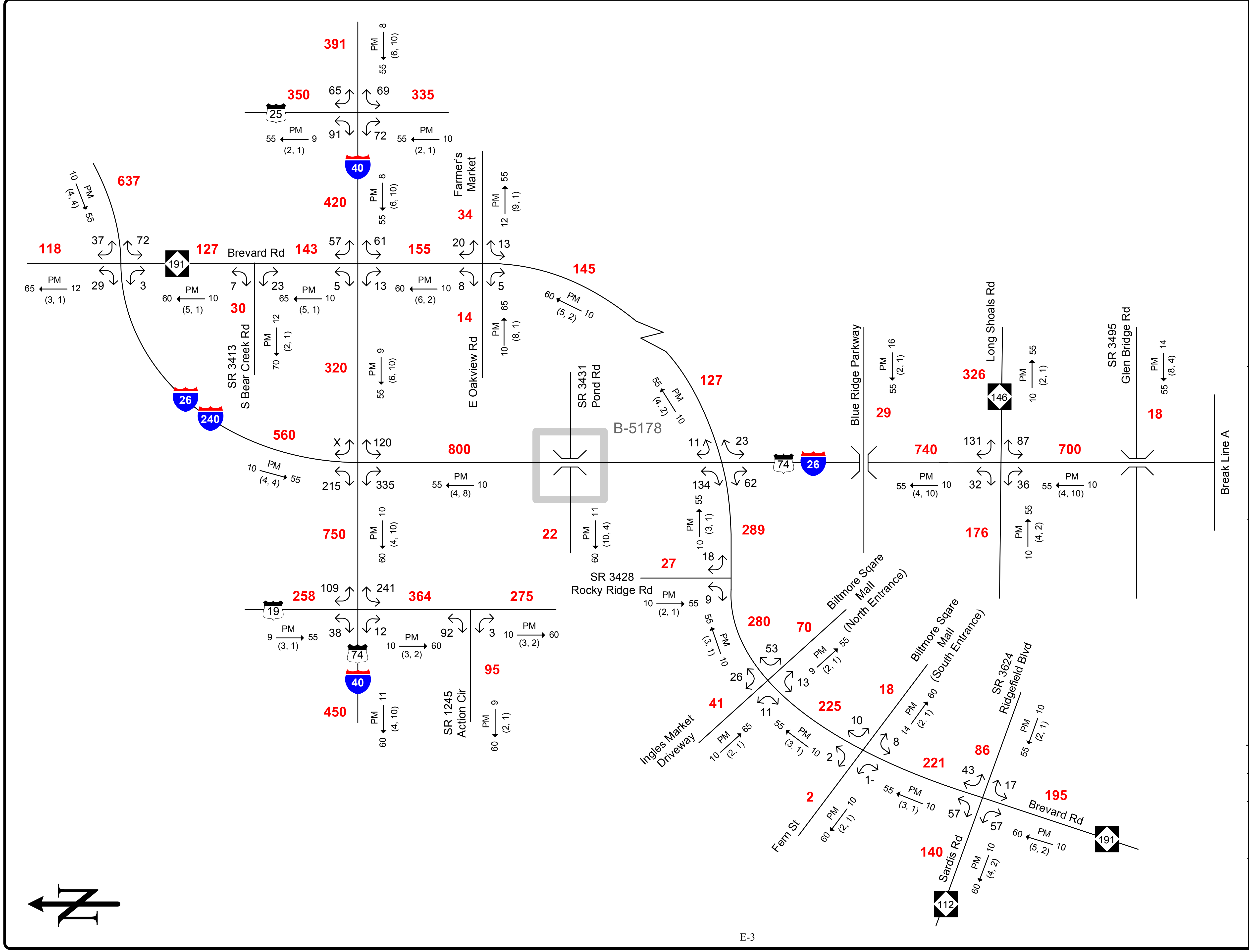
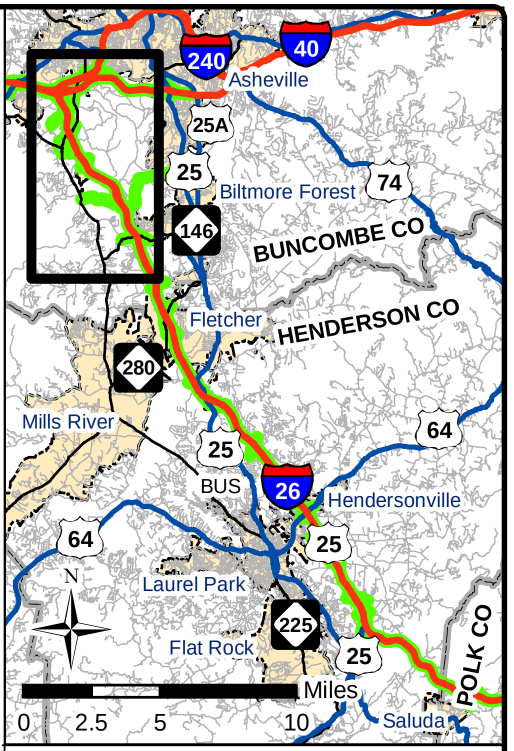
Traffic Forecast Diagrams





2011

ANNUAL AVERAGE
DAILY TRAFFIC

No Build
Existing Conditions

SHEET 1 - 1

L E G E N D

PM
K ——→ D
(d, t)

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
--------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700
WBS: 34232.1.1

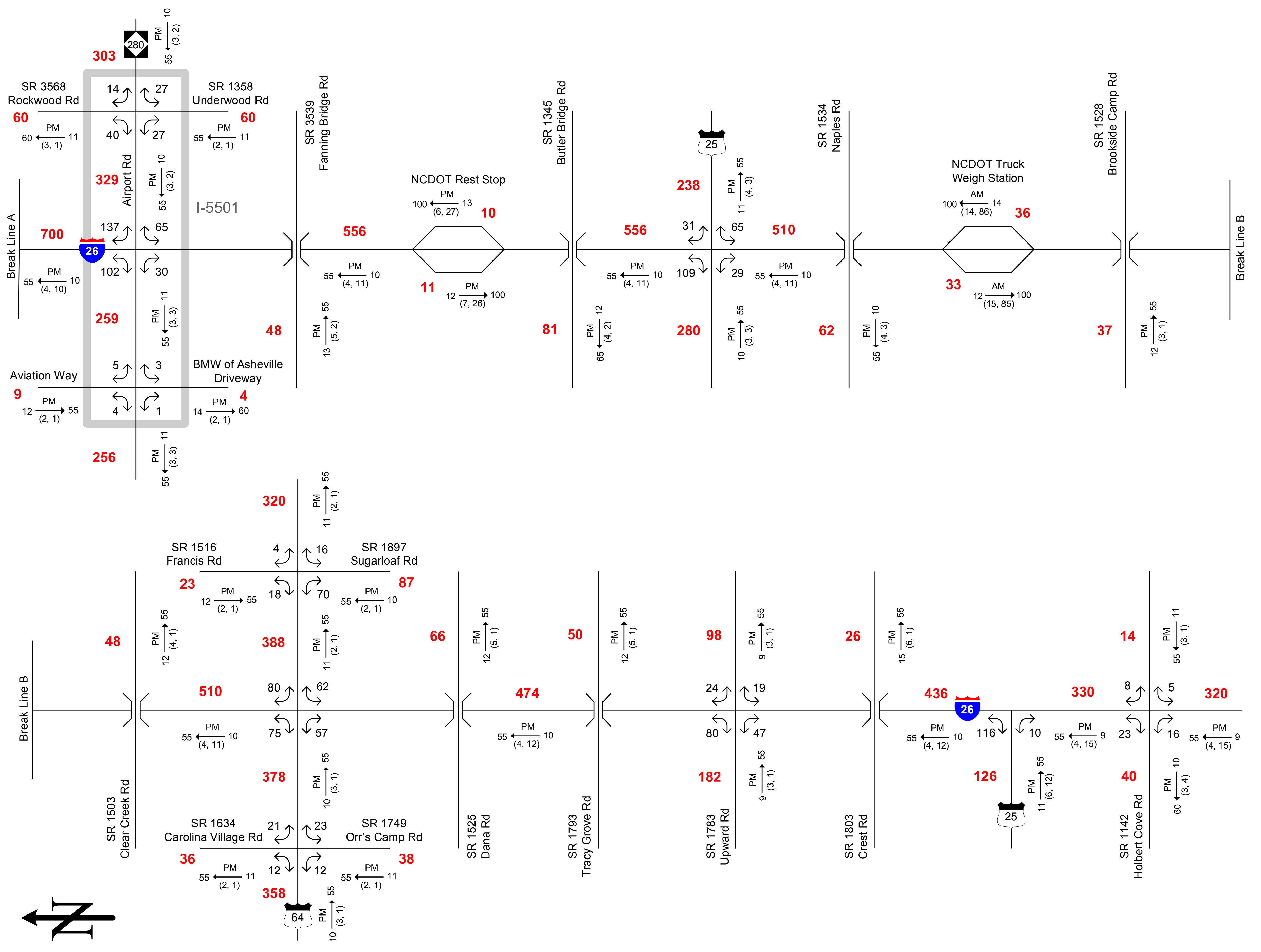
COUNTY: Buncombe
DIVISION: 13

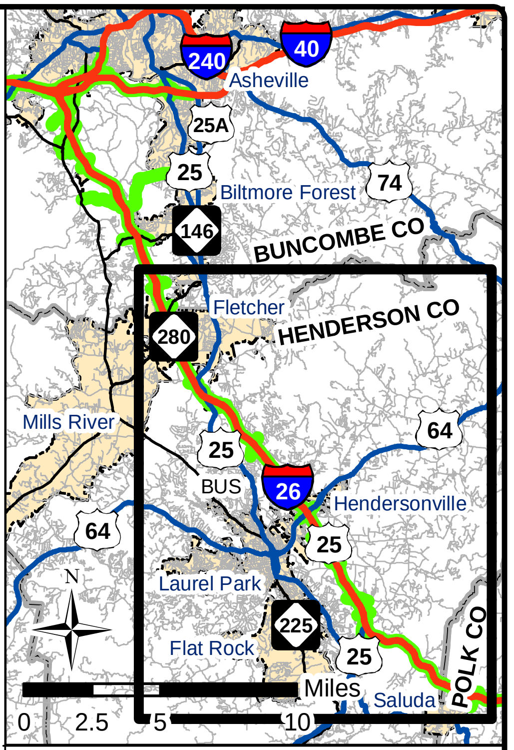
DATE: 02-14-2012

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26





2011

ANNUAL AVERAGE
DAILY TRAFFIC

No Build
Existing Conditions
SHEET 1 – 2

L E G E N D

PM
K ──► D
(d, t)

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
-------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700 **WBS:** 34232.1.1

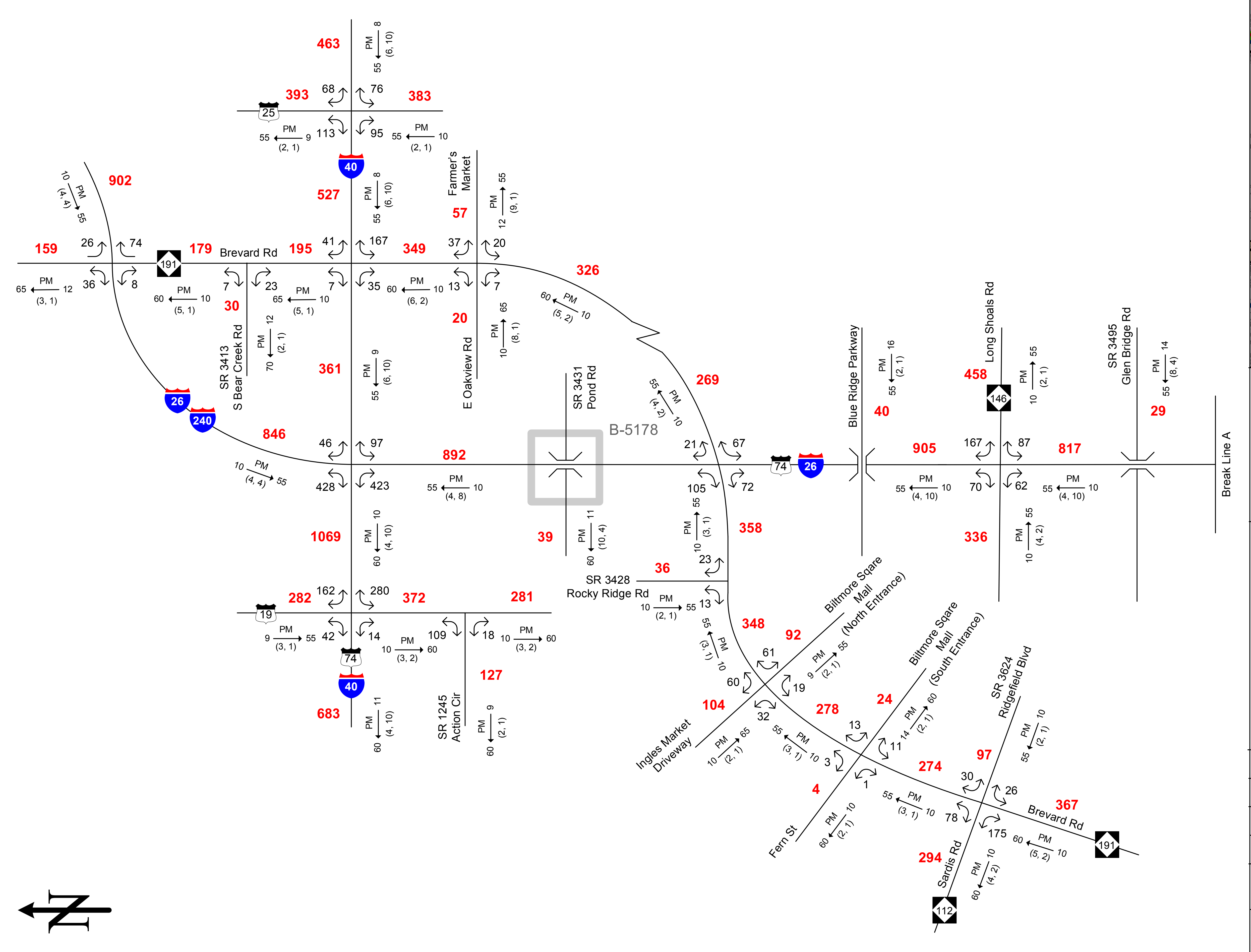
COUNTY: Buncombe **DIVISION:** 13

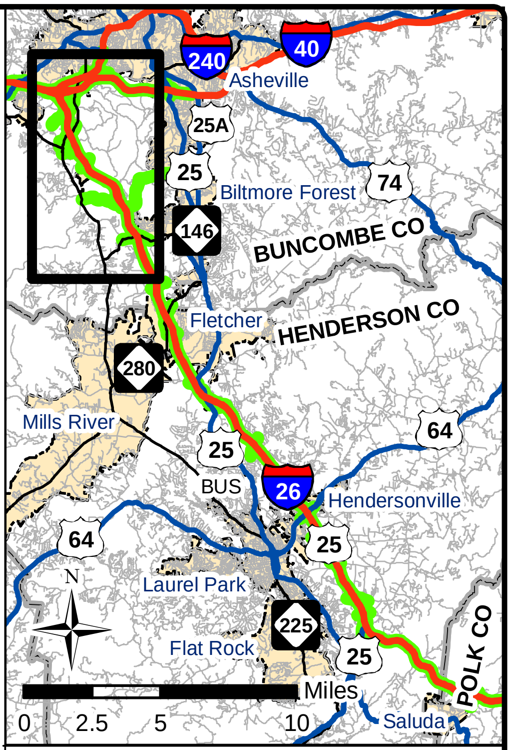
DATE: 02-14-2012

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26





2040

ANNUAL AVERAGE
DAILY TRAFFIC

No Build

SHEET 4 - 1

L E G E N D

PM
K → D
(d, t)

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
-------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700 **WBS:** 34232.1.1

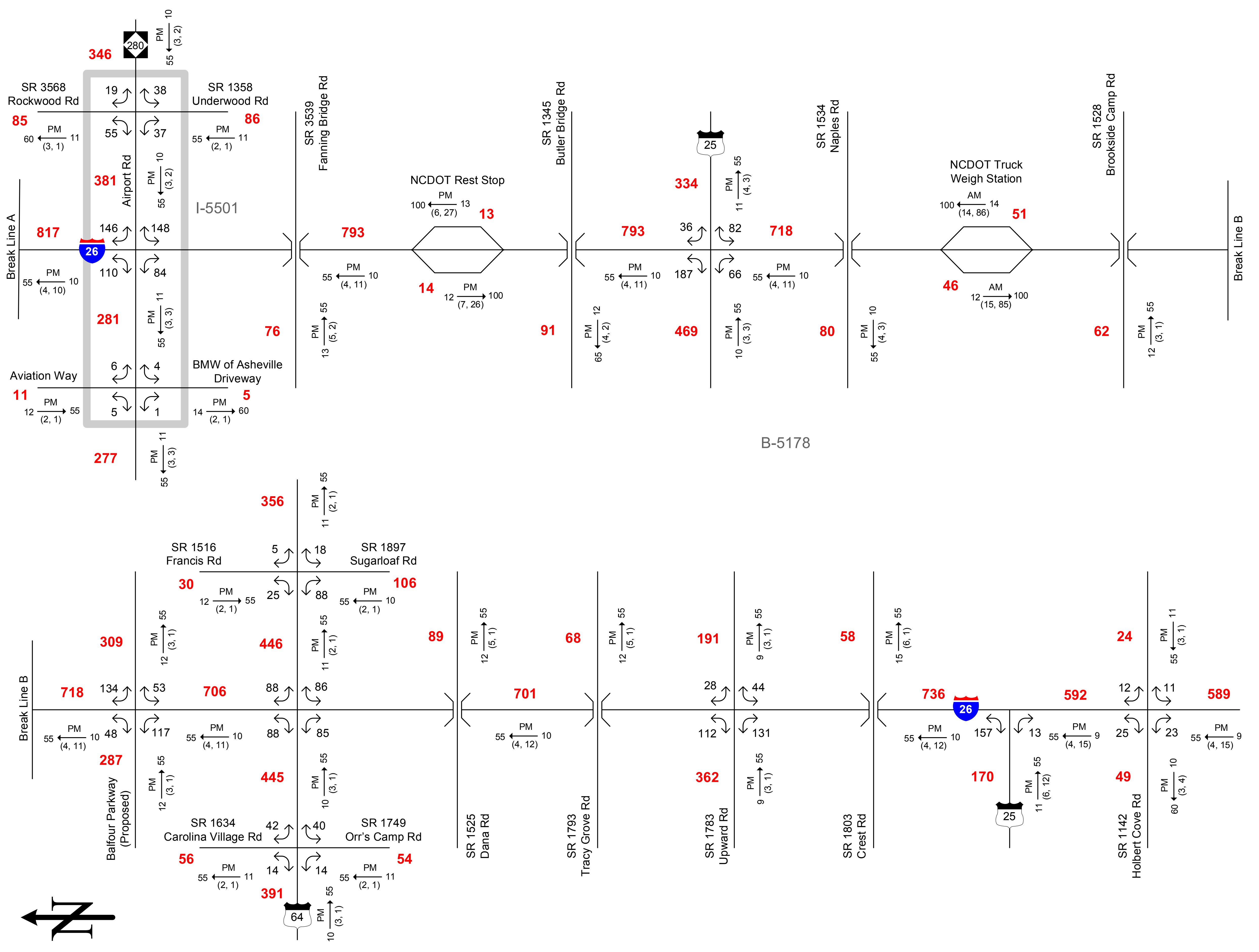
COUNTY: Buncombe **DIVISION:** 13

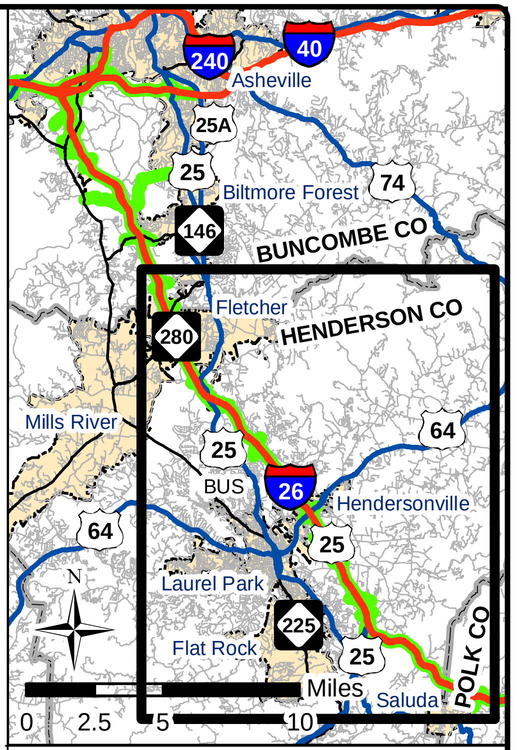
DATE: 02-14-2012

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26





2040

ANNUAL AVERAGE
DAILY TRAFFIC

No Build

SHEET 4 – 2

L E G E N D

PM
K ──► D
(d, t)

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
-------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700   **WBS:** 34232.1.1

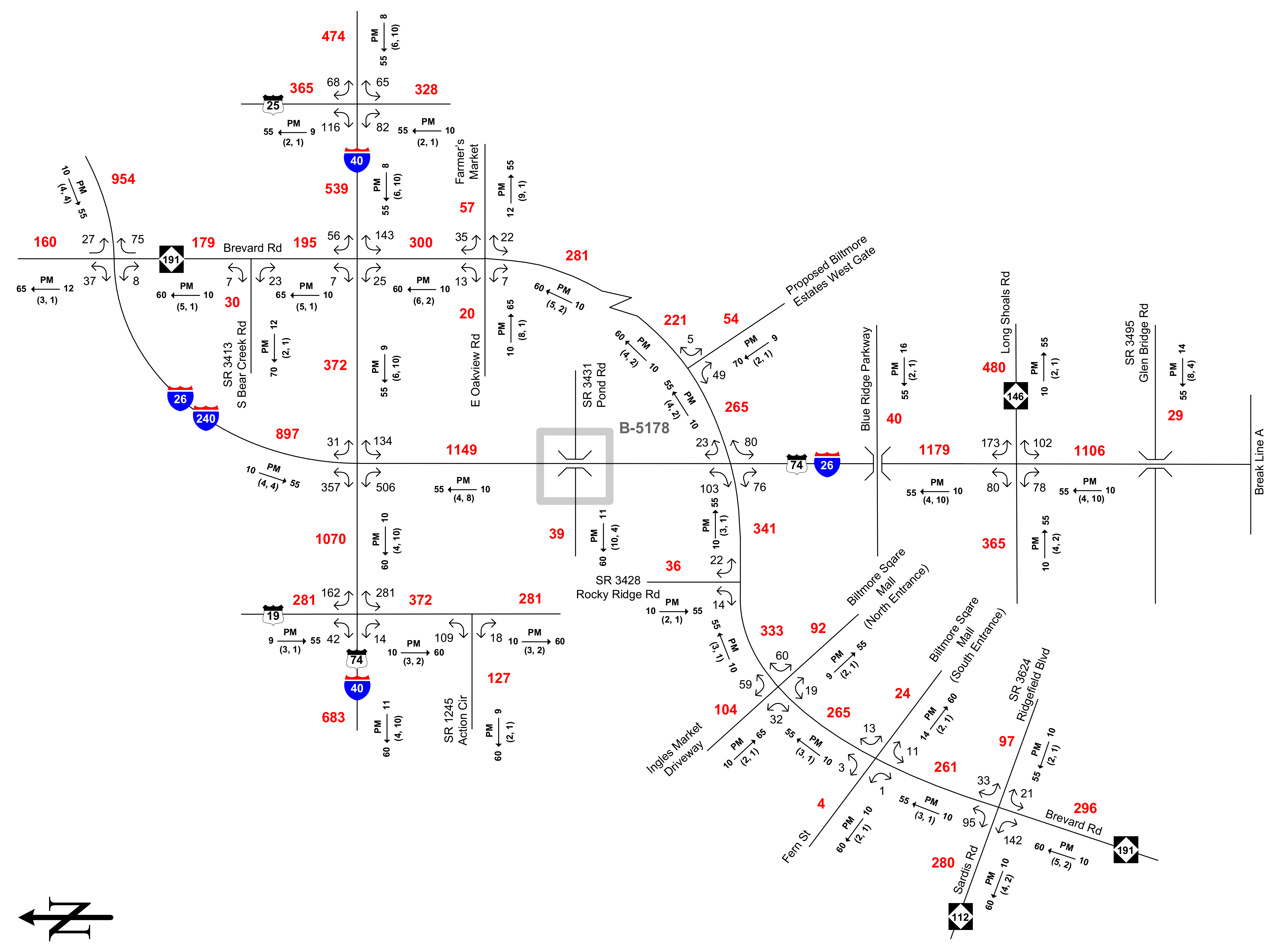
COUNTY: Buncombe   **DIVISION:** 13

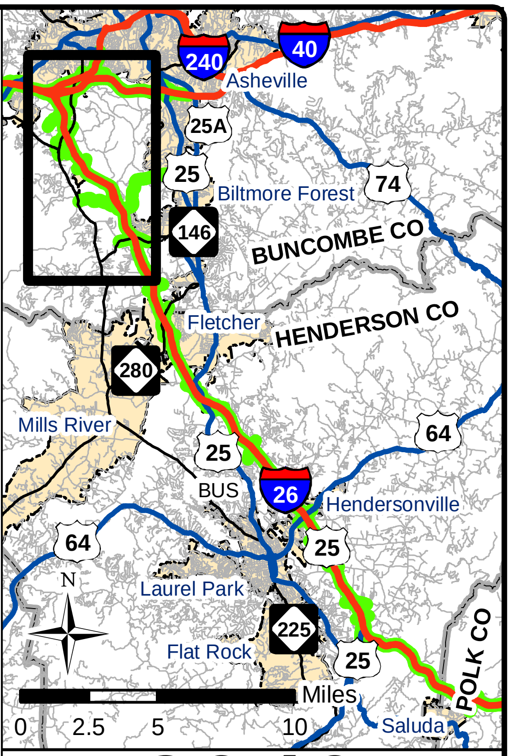
DATE: 02-14-2012

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26





2040

ANNUAL AVERAGE
DAILY TRAFFIC

Build – 8/6 Lanes

8-lanes from I-40 (Exit 31) to US 25 (Exit 44)
6-lanes from US 25 (Exit 44) to US 25 (Exit 54)

SHEET 8 - 1

LEGEND

K ← PM (d, t) → D

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
-------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700 **WBS:** 34232.1.1

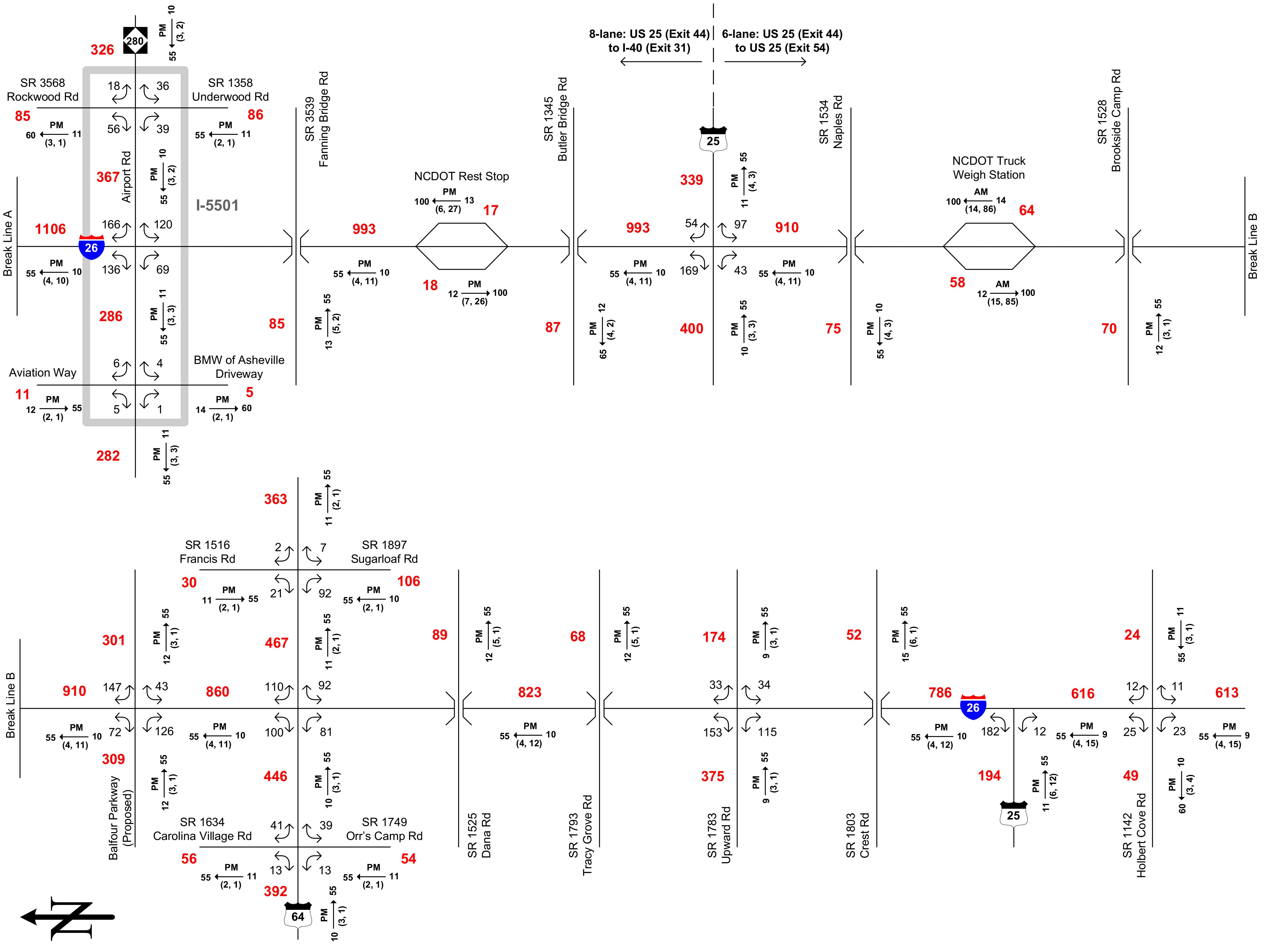
COUNTY: Buncombe **DIVISION:** 13

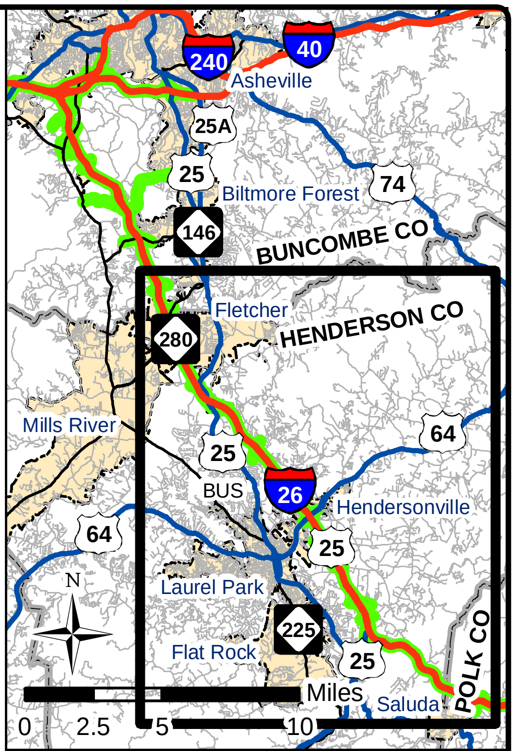
DATE: 12-16-2013

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26





2040

ANNUAL AVERAGE DAILY TRAFFIC

Build – 8/6 Lanes

8-lanes from I-40 (Exit 31) to US 25 (Exit 44)
6-lanes from US 25 (Exit 44) to US 25 (Exit 54)

SHEET 8 - 2

L E G E N D

K ← PM → D
(d, t)

###	No. of Vehicles Per Day (VPD) in 100s
1-	Less than 50 VPD
X	Movement Prohibited
-------	Roadway
K	Design Hour Factor (%)
PM	PM Peak Period
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: I-4400 / I-4700 **WBS:** 34232.1.1

COUNTY: Buncombe **DIVISION:** 13

DATE: 12-16-2013

PREPARED BY: Keith Dixon

LOCATION: I-26 from I-40 in Buncombe Co. to US 25 in Henderson Co.

PROJECT: Widen I-26

Appendix F

North Carolina Department of Transportation

Traffic Noise Policy

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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TRAFFIC NOISE POLICY

Effective Date: October 6, 2016

Noise Policy Committee:

Glenn Mumford, PE ……….Roadway Design Unit
Drew Joyner, PE……………Human Environment Section
Brian Hanks, PE…………....Structures Management Unit
Daniel Keel, PE…………….Division of Highways
Mike Mills, PE……………..Division Engineer
Pat Ivey, PE…………..……..Division Engineer
Greg Smith, PE……………..Human Environment Section

Sponsors:

Clarence Coleman, PE ……..Federal Highway Administration
Felix Davila, PE…………….Federal Highway Administration
Edward L. Curran…………..Board of Transportation

APPROVED BY:

10-6-16
Date of Approval

John F. Sullivan, III, PE, Division Administrator
Federal Highway Administration

10.6.16
Date of Approval

Nicholas J. Tennyson
Secretary of Transportation

10-5-16
Date of Approval

Edward L. Curran, Chairman
Board of Transportation

Person Responsible
for Policy:

Traffic Noise & Air Quality Supervisor
Human Environment Section
1598 Mail Service Center
Raleigh, North Carolina 27699-1598
(919) 707-6087

DEFINITIONS

a) Decibel (dB) - The logarithmic unit for measuring sound pressure levels. For traffic noise measurements, decibels are most commonly reported in terms of the A-weighing frequency scale, which best includes the frequencies to which human hearing is typically most sensitive and is denoted by the abbreviation dB(A).

b) Leq – The equivalent steady -state sound level which, in a defined period of time, contains the same amount of acoustic energy as a time-varying sound level during the same period of time.

c) Receptor – Any location that receives traffic noise.

d) Impacted Receptor – A receptor for which the predicted hourly equivalent traffic noise level 1) meets or exceeds the approach criteria value found in Table 1 of this policy or 2) exceeds the existing ambient noise level by 10 dB(A) or more.

e) Benefited Receptor - All receptors, both impacted and non-impacted, that receive a noise level reduction of 5 dB(A) or more through placement of a noise abatement measure.

f) Noise Abatement Measure – Any method used to reduce traffic noise levels, such as noise walls and earthen berms.

g) Worst Noise Hour – The hour within a day in which the highest magnitude hourly equivalent sound level occurs. The worst traffic noise hour typically occurs when traffic is flowing freely at a high volume relative to the peak traffic hour volume, with a high percentage of trucks.

h) Practicable – Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

INTRODUCTION

This document represents the North Carolina Department of Transportation (hereinafter NCDOT) policy on highway traffic noise and construction noise and describes the implementation of the requirements of the Federal Highway Administration (hereinafter FHWA) Noise Standard at 23 Code of Federal Regulations Part 772 (23 CFR 772) as they relate to federal-aid and select state-funded highway construction in North Carolina. This policy was developed by the NCDOT and reviewed and approved by the FHWA.

The North Carolina Department of Transportation Traffic Noise Manual and 23 CFR 772 are intended to be companion documents to this policy.

PURPOSE

This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures and the equitable and cost-effective expenditure of public funds for noise abatement. Where the FHWA has given highway agencies flexibility in implementing the 23 CFR 772 standards, this policy describes the NCDOT approach to implementation.

APPLICABILITY

Projects with a Date of Public Knowledge on or after the effective date of this policy shall comply with the criteria of this policy.

Federal–Aid Projects

This policy applies to all "Type I" federal or federal-aid highway projects in the State of North Carolina, including federal projects that are administered by local public agencies. Therefore, this policy applies to any highway project that is funded with federal-aid highway funds or requires FHWA approval regardless of funding sources. NCDOT does not participate in nor fund Type II (retrofit) projects along existing transportation facilities. Noise analyses are not required for Type III projects. Each of these project types are defined below. This policy shall be applied uniformly and consistently to all Type I federal projects throughout North Carolina.

Type I Project

(a) The construction of a highway on new location; or,

(b) The physical alteration of an existing highway where there is either:
  (i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,
  (ii) Substantial Vertical Alteration. A project that removes shielding, therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or,

(c) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,

(d) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,

(e) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,

(f) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
(g) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.

(h) If a project is determined to be a Type I project under this definition then the entire project area as defined in the environmental document is a Type I project.

Type II Project.

A Federal or Federal-aid highway project for noise abatement on an existing highway. For a Type II project to be eligible for Federal-aid funding, the highway agency must develop and implement a Type II program in accordance with 23 CFR 772.7(e).

Type III Project

A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

The highway traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials in 23 CFR 772 and this policy constitute the noise standards mandated by 23 U.S.C. 109(1). All federally-funded highway projects which are developed in conformance with this policy shall be deemed to be in accordance with the FHWA noise standards.

State-Funded Projects

Projects that are State funded do not use the federal project type designation for applicability.

This policy will apply to State funded projects located on a US or Interstate route that is full control of access where the project involves adding a through-traffic lane.

All other State-funded projects for which a State Environmental Assessment (EA) or State Environmental Impact Statement (EIS) is prepared will comply with the North Carolina Environmental Policy Act (SEPA) and the North Carolina Administrative Code. For these projects, noise barriers will be considered where practicable.

DATE OF PUBLIC KNOWLEDGE

The Date of Public Knowledge of the location and potential noise impacts of a proposed highway project is the approval date of the final environmental document, e.g., Categorical Exclusion (CE), State or Federal Finding of No Significant Impact (FONSI) or State or Federal Record of Decision (ROD).

NCDOT is not responsible for evaluating or implementing any noise barriers to protect developed lands that were not permitted before the Date of Public Knowledge.

The criterion for determining when undeveloped land is permitted for development is the approval date of a building permit for an individual lot or site. Approval of a development plat or any other development plan does not meet the permitted criteria.

NCDOT advocates use of local government authority to regulate land development, planning, design and construction in such a way that noise impacts are minimized.

TRAFFIC NOISE PREDICTION

All traffic noise analyses performed by or for NCDOT must utilize the most current version of the FHWA Traffic Noise Model (TNM®) or any other model determined by the FHWA to be consistent with the methodology of the TNM® model, pursuant to 23 CFR 772.9.

Average pavement type shall be used in the FHWA TNM® for future noise level prediction.

Noise contour lines may be used only for project alternative screening or for providing information to local officials for their land use planning efforts associated with undeveloped lands as per 23 CFR 772.17. Noise contours shall not be used for determining highway traffic noise impacts or assessing noise barriers.

Traffic characteristics that yield the worst noise hour equivalent traffic noise levels, expressed in Leq(h), for the Design Year shall be used in predicting noise levels and assessing noise impacts.

Traffic noise prediction must adhere to all direction contained in the NCDOT Traffic Noise Manual.

NOISE IMPACT DETERMINATION

Noise abatement measures for NCDOT highway projects must be considered when traffic noise impacts are created by either of the following two conditions:

(a) The predicted worst noise hour Leq(h) traffic noise levels for the Design Year approach (reach one decibel less than) or exceed the Noise Abatement Criteria (NAC) contained in 23 CFR 772 and in Table 1 of this policy, OR

(b) The predicted worst noise hour Leq(h) traffic noise levels for the Design Year substantially exceed existing noise by 10 dB(A) or more.

A receptor is a discrete or representative location within a noise sensitive area(s) for any of the land uses listed in Table 1. For multifamily dwellings, each residence shall be counted as one receptor when determining impacted and benefited receptors. Non-residential receptors shall be represented by Equivalent Receptors calculated according to direction contained in the NCDOT Traffic Noise Manual.

Primary consideration shall be given to exterior areas where frequent human use occurs in the determination of traffic noise impacts.

A traffic noise analysis shall be completed for each project alternative under detailed study and for all receptors and Equivalent Receptors defined to represent land use activities A, B, C, D, and E listed in Table 1 that are present in the study area. FHWA approval is required for designating a Category A Activity on federally-funded projects. Traffic noise analyses are not required for Activity Category F land uses. Noise predictions are required for Activity Category G land uses to the extent needed to develop estimated noise levels to provide to local officials for planning purposes.

Table 1

Noise Abatement Criteria

Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))

Activity Category	Activity Criteria[1] Leq(h)[2]	Evaluation Location	Activity Description
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.
B [3]	67	Exterior	Residential
C [3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare 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, Section4(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
E [3]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
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] The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

[3] Includes undeveloped lands permitted for this activity category.

ANALYSIS OF NOISE ABATEMENT MEASURES

When traffic noise impacts are identified, noise abatement measures shall be considered and evaluated for feasibility for all impacted receptors and reasonableness for all benefited receptors. All of the following conditions must be met in order for noise abatement measures to be justified and incorporated into project design, as applicable. Failure to achieve any single element of feasibility or reasonableness will result in the noise abatement measure being deemed not feasible or not reasonable, whichever applies.

NCDOT will provide noise barriers for all possible impacted receptors that meet the feasibility and reasonableness criteria found in this policy. Noise barriers will not be extended solely to provide noise reduction for non-impacted receptors. Benefits for non-impacted receptors will only occur when they are incidental in noise barriers designed for impacted receptors.

Feasibility

The combination of acoustical and engineering factors considered in the evaluation of a noise barrier.

(a) Any receptor that receives a minimum noise level reduction of five dB(A) due to a noise barrier shall be considered a benefited receptor. Noise reduction of five dB(A) must be achieved for at least two impacted receptors.

(b) Engineering feasibility of noise barriers shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

Reasonableness

The combination of social, economic, and environmental factors considered in the evaluation of a noise barrier.

(a) Property owners and tenants of all benefited receptors shall be solicited to obtain their preferences for or against a proposed noise barrier. No tenant ballots are distributed for vacant rental property. Points per ballot shall be distributed in the following weighted manner:

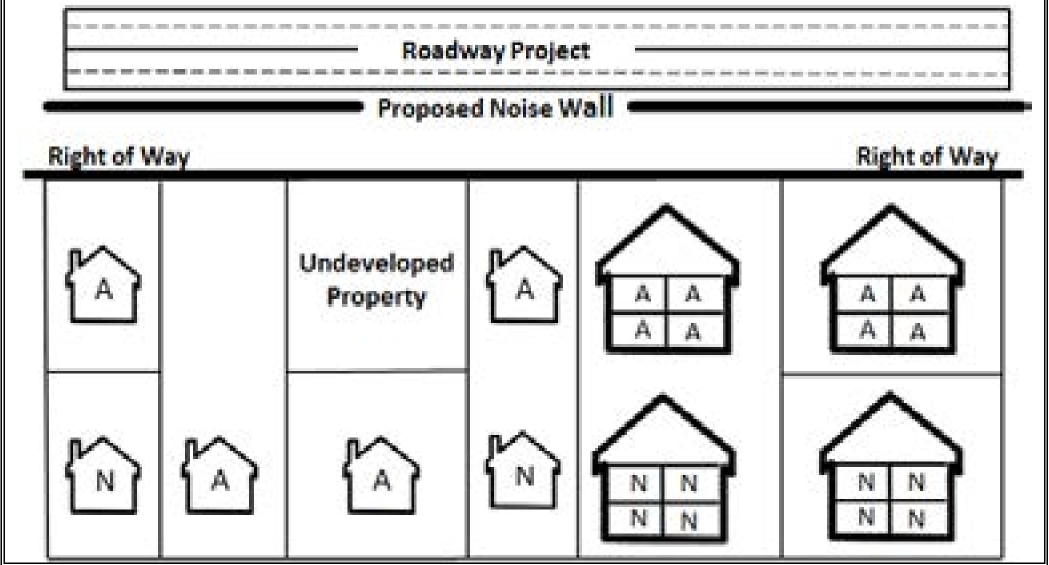
- 5 points/ballot for adjacent property owners who reside at property
- 4 points/ballot for adjacent property owners who rent property to others
- 3 points/ballot for all non-adjacent property owners who reside at property
- 2 points/ballot for all non-adjacent property owners who rent property to others
- 1 point/ballot vote for all tenants of rental property

Adjacent Receptor is a benefited receptor that 1) represents a property that abuts the highway right of way or 2) has no benefited receptor between it and the highway. Where multiple buildings containing benefited receptors are on the same property, such as an apartment or condominium complex, only the building closest to the highway is an adjacent receptor. Adjacent receptors will most often, but not always, be part of the front row of benefited receptors. Figure 1 provides graphic examples of Adjacent Receptors.

Owners of multi-unit rental locations will receive the applicable number of owner points for each individual benefited receptor (rental unit) owned.

Figure 1

Examples of Adjacent Receptors



A = Adjacent Receptor N = Non-Adjacent Receptor
Undeveloped Property = Vacant property for which no building permit has been issued and is not a park or recreation area

If 50% or greater of all possible voting points from benefited receptors for each noise barrier are received on the first solicitation, a simple majority of voting points cast will be used to determine if the proposed noise barrier will be constructed.

If less than 50% of all possible points for each noise barrier are received on the first solicitation, a second solicitation will be sent to benefited receptors who did not respond to the first solicitation.

If a second solicitation is conducted and 50% or greater of all possible voting points for each noise barrier are received after the second solicitation, a simple majority of voting points cast will be used to determine whether or not the proposed noise barrier will be constructed.

If less than 50% of total possible points for a noise barrier are received after the second solicitation, the noise barrier will not be constructed.

Noise barriers will be constructed in the case of a tie (equal number of points for and against a noise barrier).

All balloting soliciting the viewpoints of benefited property owners and applicable residents/tenants that occurs after the effective date of this policy, regardless of the Date of Public Knowledge, shall comply with the criteria of this policy.

(b) The allowable quantities for noise barriers per benefited receptor, with allowances for incremental increases based upon existing and predicted noise levels of all impacted receptors within each noise study area, are shown in Table 2.

For the purpose of calculating the incremental increase, the Noise Abatement Criteria (NAC) values for Activity Categories A, B, C, D, and E, as shown in Table 1, are to be used and not the NCDOT “approach” values used in traffic noise impact determinations.

Table 2

Allowable Noise Barrier Base Quantities

Maximum Allowable Base Quantity	Noise Level Consideration	Noise Wall	Earthen Berm
		1,500 ft^2	4,200 yd^3
Average dB(A) Increase Between Existing and Future Build for All Impacted Receptors	< 5 dB(A)	+ 0 ft^2	+ 0 yd^3
	5-10 dB(A)	+ 500 ft^2	+ 1,400 yd^3
	> 10 dB(A)	+ 1,000 ft^2	+ 2,800 yd^3
Average Exposure to Absolute Noise Levels for All Impacted Receptors	< 5 dB(A) Over NAC Activity Category	+ 0 ft2	+ 0 yd^3
	5-10 dB(A) Over NAC Activity Category	+ 500 ft^2	+ 1,400 yd^3
	> 10 dB(A) Over NAC Activity Category	+ 1,000 ft^2	+ 2,800 yd^3

(c) A noise reduction design goal of at least 7 dB(A) must be evaluated for all benefited receptors. At least one benefited receptor must achieve the noise reduction design goal of 7 dB(A) to indicate the proposed noise barrier effectively reduces traffic noise.

Other Considerations

Prior to CE approval or issuance of a FONSI or ROD, NCDOT shall identify in all applicable environmental documents:

(a) Noise barriers that are feasible and reasonable,

(b) Noise impacts for which no noise barrier appears to be feasible and reasonable;

(c) Locations where noise impacts will occur, where noise barriers are feasible and reasonable, and the locations that have no feasible and reasonable noise barriers.

(d) Whether it is “likely” or “unlikely” that noise barriers will be installed for each noise sensitive area identified. "Likely" does not mean a firm commitment. The final decision on the installation of noise barriers shall be made upon completion of the project design, the public involvement process, compliance with the NCDOT Policy, and FHWA approval.

Third Party Participation

(a) Third party funding of noise barriers cannot be used to make up the difference between the reasonable quantity allowance and the actual quantity of noise barriers. Third party funding is allowed only by local, state and federal government agencies, and can only be used to pay for additional features such as landscaping and aesthetic treatments for noise barriers that meet all feasible and reasonable criteria previously detailed in this policy. Private parties may freely enter into agreements with government agencies to develop noise barrier enhancements; however, all funding for enhancements paid to NCDOT must come from government agencies

(b) Traditional highway construction resources pay for required noise barriers. Should a local government request that materials be used that are more costly than the standard materials proposed by NCDOT, the requesting entity must assume 100% of the actual additional construction cost.

(c) If a local government insists on the provision of a noise barrier deemed not reasonable by NCDOT, a noise barrier may be installed provided the local government assumes 100% of the costs and obtains an encroachment permit from NCDOT to perform the work. These costs include, but are not limited to, preliminary and final engineering, actual construction and all related maintenance. In addition, local governments must ensure that NCDOT's material, design and construction specifications are met. The local government must also assume 100% of the liability associated with the measure and hold harmless the NCDOT.

(d) For (b) and (c) above, the settlement agreement shall be signed before third party noise barrier design begins and payment shall be made to NCDOT in accordance with N.C.G.S. 136-66.3(e).

ARCHITECTURAL TREATMENT OF NOISE WALLS

The standard noise wall architectural treatment consists of:

(a) Concrete columns; Steel piles may be used when necessary to address site conditions adverse to the use of concrete columns;

(b) Precast concrete panels textured on both sides;

(c) No texture on the uppermost foot of each wall segment;

(d) A single color of stain in brown or gray tones applied to both sides of textured panels;

(e) No stain applied to the uppermost foot of each wall segment and the concrete columns.

All enhancements to this standard noise wall must be paid for in accordance with Third Party Participation provisions in this policy.

NCDOT Division Engineers are responsible for determining noise wall textures and colors in their respective Divisions.

PUBLIC INVOLVEMENT

Communication with the community regarding noise impacts and possible noise abatement shall occur at the start of the noise study process and continue throughout the development of the project. NCDOT will communicate with citizens to present information on the nature of highway traffic noise and discuss the effects of noise abatement and how public preferences for noise abatement is solicited via a balloting process.

Noise study areas showing “likely” noise barriers and/or proposed locations of any “recommended” noise barriers will be presented and discussed when holding Public Hearings and Public Meetings. Likely noise barriers are based on preliminary design traffic noise analyses and are described in environmental documents. Recommended noise barriers are based on final design noise analyses and are usually identified after the environmental document is completed. Property owners and tenants who are being balloted for a recommended noise barrier will be provided a visual of the noise barrier location prior to their casting a ballot.

COORDINATION WITH LOCAL OFFICIALS

NCDOT will provide all traffic noise analyses to local government officials within whose jurisdiction a highway project is proposed as early in the project planning process as possible to protect future development from becoming incompatible with traffic noise levels. Specifically, environmental documents and design noise reports will contain information identifying areas that may be impacted by traffic noise, predicted noise level contour information, the best estimation of future noise levels for developed and undeveloped lands or properties in the immediate vicinity of the project and other appropriate design information. If requested, NCDOT will assist local officials with coordination and distribution of this information to residents, property owners and developers. NCDOT will provide information to assist local jurisdictions in the development of local noise controls, when requested. NCDOT strongly advocates the planning, design and construction of noise-compatible development and encourage its practice among planners, building officials, developers and others.

CONSTRUCTION NOISE

To minimize the impacts of construction noise on the public, NCDOT shall:

(a) Identify land uses or activities that may be affected by noise from construction of the project.

(b) Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall consider the benefits achieved and the overall adverse social, economic, and environmental effects and costs of the abatement measures.

(c) Consider construction techniques and scheduling to reduce construction noise impacts to nearby receptors and incorporate the needed abatement measures in the project plans and specifications.

FEDERAL PARTICIPATION

The costs of noise barriers may be included in federal-aid participating project costs with the federal share being the same as that for the system on which the project is located when:

(a) Traffic noise impacts have been identified; and

(b) Noise barriers have been determined to be feasible and reasonable pursuant to 23 CFR 772 and this policy.

REVIEW OF POLICY

This policy shall be reviewed by the NCDOT Board of Transportation at least every five years.