FINAL ABATEMENT DESIGN

I-66 WIDENING, ROUTE 29 TO ROUTE 15

Prince William County

PROJECT: 0066-076-003, B674, B675, C501, P101, R201

UPC: 93577
From: 1.2 Miles West of Route 15
To: 0.2 Miles West of Route 29

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March 2012

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1. Executive Summary

A final abatement design study was completed which evaluated potential traffic noise impacts and abatement measures associated with the proposed I-66 widening project in Prince William County, Virginia. Potential traffic noise impacts were assessed in accordance with the procedures and criteria approved by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT). The proposed project would alleviate congestion by adding two travel lanes to the eastbound and westbound lanes of Interstate 66 (I-66) from 1.2 miles west of U.S. Route 15 near the Town of Haymarket to 0.2 miles west of U.S. Route 29 in Gainesville. The two added travel lanes in each direction consist of a single occupancy vehicle (SOV) and a high occupancy vehicle (HOV) lane. A project location map is shown in ***Figure 1***.

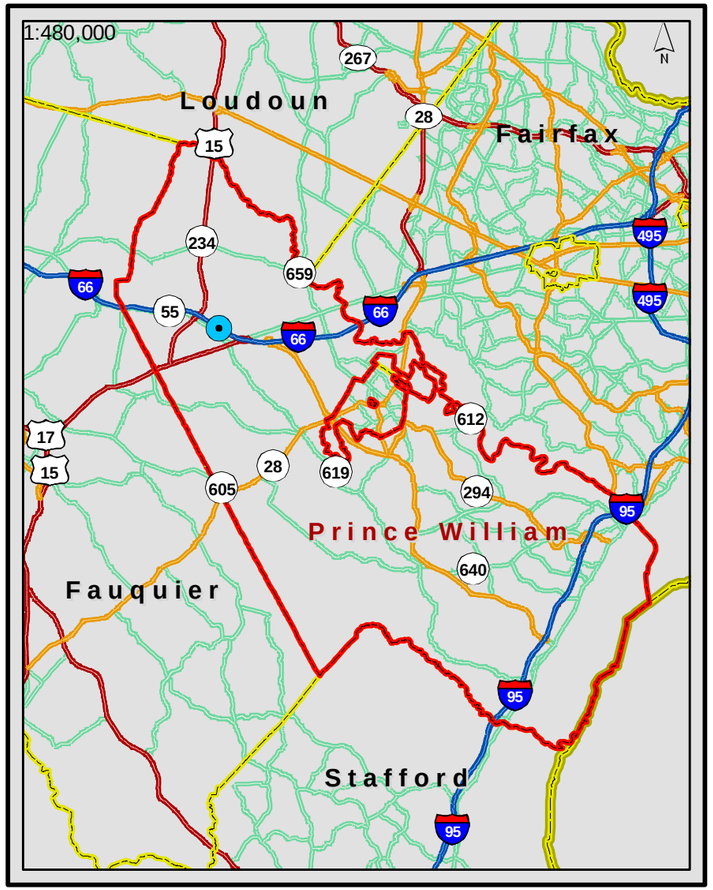
The original project limits have changed since the preliminary traffic noise study was completed. Under FHWA guidance, the western terminus of the project was lengthened to address a comment regarding the I-66 westbound HOV lane tapering back into the mainline. Under this same guidance, a final abatement design study was completed all for the locations evaluated in the original traffic noise study and the new noise sensitive sites that were added due to the change of project limits.

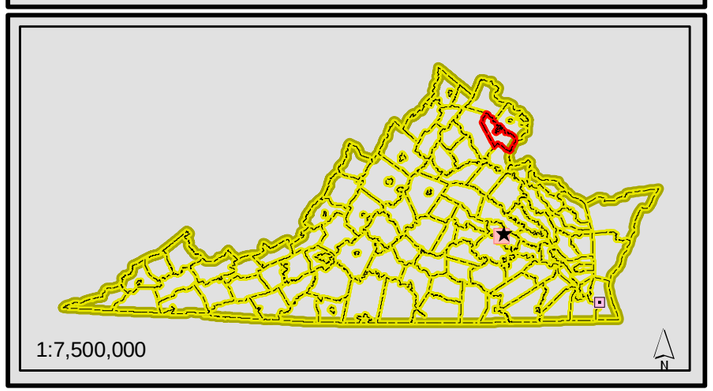
A total of 306 noise sensitive sites were modeled in the project study area representing 684 residences, several athletic fields, three playgrounds, and two basketball courts. Ninety-five sites representing 179 residences, several athletic fields, two playgrounds, and two basketball courts, are predicted to be impacted as a result of approaching or exceeding the Noise Abatement Criteria (NAC) in the design year (2036) build condition. No sites are predicted to be impacted due to substantial noise increases. For all sites studied, the existing year noise levels range from 43 to 73 dBA. The design year (2036) build noise levels range from 45 to 75 dBA.

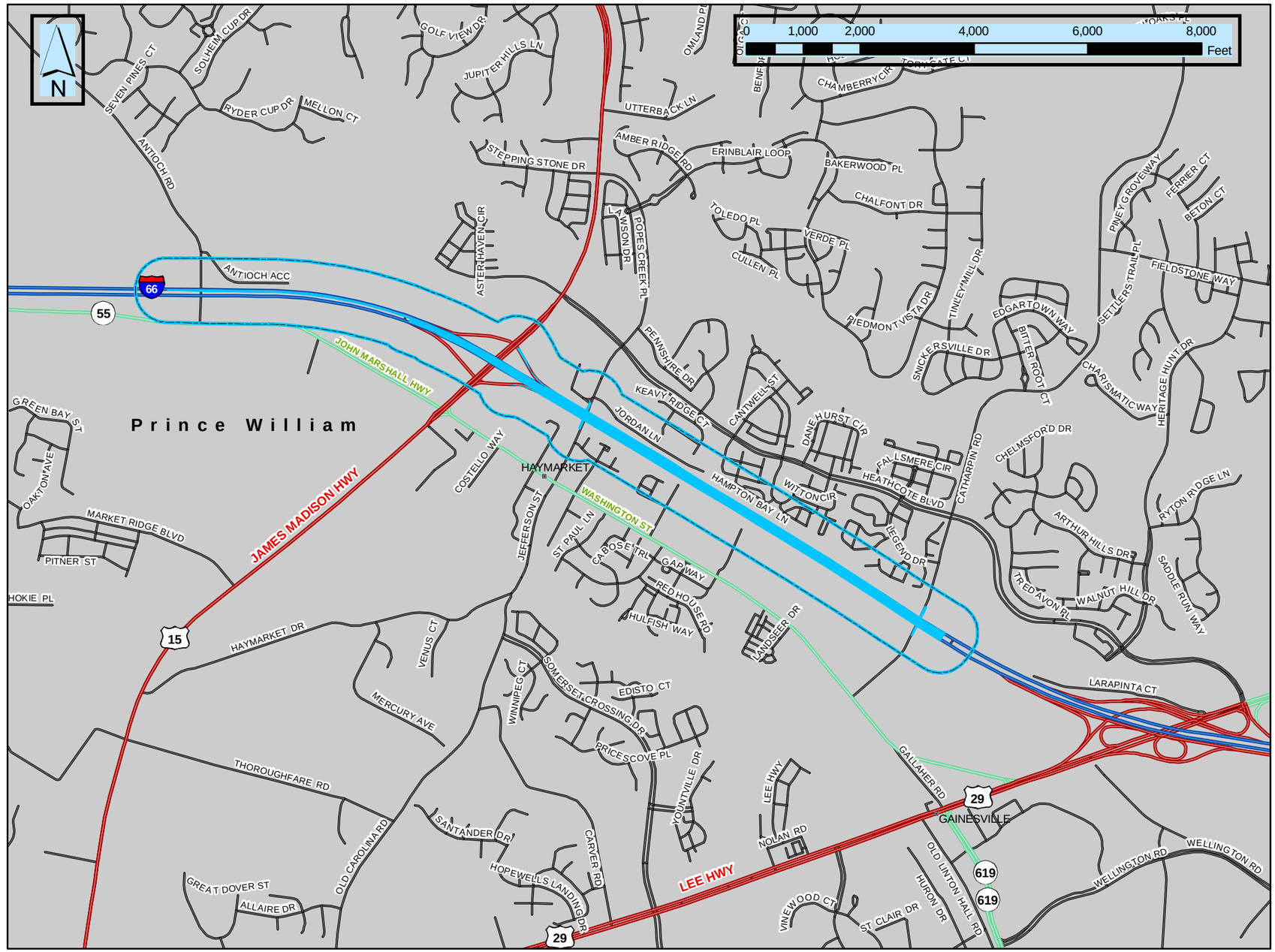
Noise abatement measures were evaluated where future noise impacts are predicted to occur. A final abatement design noise evaluation was performed for the barriers discussed in the preliminary traffic noise study. The preliminary traffic noise study was submitted in August 2011 and identified five barriers, four of which were considered to be both feasible and reasonable.

This report re-evaluated the previously identified barriers and also evaluated barriers for any new locations where future design year build impacts were predicted to occur, based on new receptors associated with planned and programmed developments and the change of project limits. Four of the six barriers that were evaluated for this report were found to be both feasible and reasonable. While Barrier 3 is considered to be both feasible and reasonable, it will only be considered for construction if the Heathcote Commons (Phase 2, Section 2) development has obtained an active building permit by the date of public knowledge.

Construction activity may cause intermittent fluctuations in noise levels. During the construction phase of the project, all reasonable measures will be taken to minimize noise impact from these activities.







I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

VDOT **Virginia Department of Transportation**

- Project Location
- Project Limits
- Project Area
- Interstate
- Primary Highway
- Seondary Highway
- State Route
- Local Roads
- County Boundary
- Prince William County

I-66 Widening Project
From SR 15 to SR 29

Prince William County and
the Town of Haymarket

Figure 1
Project Location and Overview

2. Introduction

VDOT has completed a traffic noise study and abatement analysis as a requirement for the I-66 Widening Project in Prince William County, Virginia. Potential traffic noise impacts were assessed in accordance with the procedures and criteria approved by the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT). The proposed project would alleviate congestion by adding two travel lanes to the eastbound and westbound lanes of Interstate 66 (I-66) from 1.2 miles west of U.S. Route 15 near the Town of Haymarket to 0.2 miles west of U.S. Route 29 in Gainesville. The two added travel lanes consist of a single occupancy vehicle (SOV) and a high occupancy vehicle (HOV) lane in each direction. A project location map is shown in ***Figure 1***.

The objective of this analysis is to assess the potential traffic noise impacts associated with the proposed roadway improvement project, and to evaluate potential noise abatement measures wherever impacts are predicted to occur.

This report documents a description of noise terminology, the applicable standards and criteria, a description of the computations of existing and future noise levels, a projection of future noise levels, identification of potential noise impacts, evaluate measures to mitigate noise impacts, noise abatement, and a discussion of construction noise.

3. Legislation and Noise Fundamentals

3.1 Regulatory Requirements

The Noise Control Act of 1972 gives the US Environmental Protection Agency (USEPA) the authority to establish noise regulations to control major noise sources, including motor vehicles and construction equipment. Furthermore, the USEPA is required to set noise emission standards for motor vehicles used for interstate commerce and the FHWA is required to enforce the USEPA noise emission standards through the Office of Motor Carrier Safety. The National Environmental Policy Act (NEPA) of 1969 gives broad authority and responsibility to Federal agencies to evaluate and mitigate adverse environmental impacts caused by Federal actions. FHWA is required to comply with NEPA including mitigating adverse highway traffic noise effects. The Federal-Aid Highway Act of 1970 mandates FHWA to develop standards for mitigating highway traffic noise. It also requires FHWA to establish traffic noise level criteria for various types of land uses. The Act prohibits FHWA approval of federal-aid highway projects unless adequate consideration has been made for noise abatement measures to comply with the standards. FHWA regulations for highway traffic noise for federal-aid highway projects are contained in 23 CFR 772. The regulations contain noise abatement criteria, which represent the maximum acceptable level of highway traffic noise for specific types of land uses. The regulations do not mandate that the abatement criteria be met in all situations, but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded.

The State Noise Abatement Policy was developed to implement the requirements of 23 Code of Federal Regulations (CFR) Part 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2011), FHWA's Highway Traffic Noise Analysis and Abatement

Policy and Guidance (December 2011), and the noise related requirements of The National Environmental Policy Act of 1969. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 and was updated on September 16, 2011. This policy is applicable to Type I federal-aid highway projects which involves the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment.

3.1 Traffic Noise Descriptors

Noise is generally defined as unwanted or annoying sound. Airborne sound occurs by a rapid fluctuation of air pressure above and below atmospheric pressure. Sound pressure levels are usually measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level.

Most sounds occurring in the environment do not consist of a single frequency, but rather a broad band of differing frequencies. The intensities of each frequency add to generate sound. Because the human ear does not respond to all frequencies equally, the method commonly used to quantify environmental noise consists of evaluating all of the frequencies of a sound according to a weighting system. It has been found that the A-weighted filter on a sound level meter, which includes circuits to differentially measure selected audible frequencies, best approximates the frequency response of the human ear.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources, creating a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, a statistical noise descriptor called the equivalent hourly sound level, or Leq (h), is commonly used. Leq (h) describes a noise sensitive receptor's cumulative exposure from all noise-producing events over a one-hour period.

Because decibels are logarithmic units, sound levels cannot be added by ordinary arithmetic means. The following general relationships provide a basic understanding of sound generation and propagation:

- An increase, or decrease, of 10 dB will be perceived by a receptor to be a doubling, or halving, of the sound level
- Doubling the distance between a highway and receptor will produce a 3 dB sound level decrease
- A 3 dB sound level increase is barely detectable by the human ear

4. Impact Criteria and Methodology

4.1 Noise Abatement Criteria

The State Noise Abatement Policy has adopted the Noise Abatement Criteria (NAC) that have been established by FHWA (23 CFR 772) for determining traffic noise impacts for a variety of land uses. The NAC, listed in ***Table 1*** for various activities, represent the upper limit of acceptable traffic noise conditions and also a balancing of that which may be desirable with that which may be achievable. The NAC applies to areas having regular human use and where lowered noise levels are desired. They do not apply to the entire tract of land on which the activity is based, but only to that portion where the activity takes place.

The NAC is given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The noise impact assessment is made using the guidelines listed in ***Table 1***. Noise-sensitive sites potentially affected by this project are classified as Category B and Category C.

Table 1: FHWA Noise Abatement Criteria

Hourly A-Weighted Sound Level Decibels (dBA)			
Activity Category	**Activity Leq(h)**	**Evaluation Location**	**Description Of Activity Category**
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B*	67	Exterior	Residential
C*	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E*	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	Exterior	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
Source: 23 CFR Part 772			
*: Includes undeveloped lands permitted for this activity category			

4.2 Definition of Noise Impact

Traffic noise impacts occur if either of the following two conditions is met:

- The predicted traffic noise levels approach or exceed the NAC, as shown in ***Table 1***. The VDOT State Noise Abatement Policy defines an approach level to be used when determining a traffic noise impact. The approach level shall be at least 1 dB(A) less than the Noise Abatement Criteria for Activity Categories A to E. For example, for a category B receptor, 66 dBA would be approaching 67 dBA and would be considered an impact. If design year noise levels "approach or exceed" the NAC, then the activity is impacted and a series of abatement measures must be considered.

- The predicted traffic noise levels are substantially higher than the existing noise levels. The VDOT State Noise Abatement Policy defines a substantial noise increase as when predicted highway traffic noise levels exceed existing noise levels by 10 dBA or more. For example, if a receptor's existing noise level is 50 dBA, and if the future noise level is 60 dBA, then it would be considered an impact. The noise levels of the substantial increase impact do not have to exceed the appropriate NAC.

If traffic noise impact is identified within the project corridor, then consideration of noise abatement measures is necessary. The final decision on whether or not to provide noise abatement along a project corridor will take into account the feasibility of the design and overall cost weighted against the environmental benefit.

4.3 Highway Noise Computation Model

A review of the project corridor has established roadway traffic as the dominant source of noise for the build alternative. Since roadway noise can be determined accurately through computer modeling techniques for areas that are dominated by road traffic, design year traffic noise calculations have been performed using the Federal Highway Administration's Traffic Noise Model (FHWA TNM®) Version 2.5, which is the latest approved version. The FHWA TNM ® was developed and sponsored by the U. S. Department of Transportation and John A. Volpe National Transportation Systems Center, Acoustics facility. The TNM estimates vehicle noise emissions and resulting noise levels based on reference energy mean emission levels. The existing and proposed alignments (horizontal and vertical) are input into the model, along with the receptor locations, traffic volumes of cars, medium trucks (vehicles with 2 axles and 6 tires,) heavy trucks, average vehicle speeds, pavement type, and any traffic control devices. The TNM uses its acoustic algorithms to predict noise levels at the selected receptor locations by taking into account sound propagation variables such as, atmospheric absorption, divergence, intervening ground, barriers, building rows, and sometimes heavy vegetation.

4.4 Data Sources

4.4.1 Roadways and Alignments

The design files for the existing conditions and the proposed build were developed by Whitman, Requardt, & Associates, LLP (WRA). Design files were converted to three-dimensional (3D) DXF files that were then imported into the TNM with elevations already included. Existing GIS elevation data was obtained from the project TIN (Triangulated Irregular Network) file, and from

the 2002 statewide TIN files, available courtesy of the Virginia Geographic Information Network (VGIN). The statewide TIN files were used to supplement the project file where coverage was needed. The TIN file is a vector based representation of the physical land surface made up of irregularly distributed points with 3D coordinates (x,y,z) that are arranged in a network of non-overlapping triangles. Elevations for the proposed future design build were input from the appropriate plan and profile sheets for the project.

4.4.2 Traffic Volumes and Flow Control

Traffic data for traffic noise computations were supplied by VDOT as hourly volumes and operating speeds by roadway segment for the 2011 existing condition, and future design-year (2036) build conditions. Separate medium and heavy truck percentages were provided for each roadway segment. As required by FHWA and VDOT, the noise analysis was performed for the loudest hour of the day. Noise levels have been predicted for that hour of the day when the vehicle volume, operating speed, and number of trucks (vehicles with 3 or more axles) combine to produce the worst noise conditions. According to FHWA guidance, the "worst hourly traffic noise impact" occurs at a time when truck volumes and vehicle speeds are the greatest, typically when traffic is free flowing. The worst noise hour used in this study was from 4 to 5 p.m.

4.5.3 Receptors

A total of 306 noise sensitive sites were modeled in the project study area representing 684 residences, several athletic fields, three playgrounds, and two basketball courts.
The location of all the receptors modeled in TNM can be found in **(Appendix A-1.)** Receptor locations were identified based on an aerial photo review and site visit. A default height of 5 feet above the base ground elevation was used for all first floor receptors and second floor receptors were modeled using 17 feet. Second floor receptors were only modeled because of the presence of individual outdoor balconies. Specific receptor placement in the model is generally based on exterior areas where there is frequent human use.

4.5.3 Terrain Lines

Terrain lines were used in the model to represent important and intervening terrain features associated with the proposed project, such as drainage ditches, roadway centerlines, and general changes in elevation. Terrain lines input into the TNM were derived from the survey trend lines used to create the project TIN file. Terrain line features for areas beyond the limits of the project TIN file coverage were based on the 2002 statewide TIN files available from VGIN.

4.5.4 Barriers

Barriers were evaluated in the project corridor for noise abatement evaluation. Refer to ***Section 7.1*** for the barrier discussions.

5. Existing Noise Environment

To assess existing noise conditions within the project study area, short term noise monitoring was conducted. During the noise monitoring, a windshield survey of noise-sensitive land uses and identification of major sources of acoustical shielding was conducted to supplement the mapping provided.

Noise monitoring was conducted in the vicinity of noise-sensitive land uses near the proposed project alignment. The noise monitoring characterized existing noise levels in the study area but were not necessarily conducted during the loudest hour of the day. The monitoring data can be used as the baseline against which probable future noise levels are compared and potential impacts assessed. A validation exercise was carried out to evaluate the accuracy of the noise prediction model, and is presented in ***Section 5.2***, along with additional information about the computation methods.

5.1 Short Term Noise Monitoring

The purpose of noise monitoring is to gather data that is used to develop a comparison between the monitored results and the output obtained from the noise prediction model. This exercise is performed to validate the model so that it can be used with confidence to determine the worst hour noise levels, and predict the future noise levels.

Short-term noise measurements of 10 minutes duration were obtained at a total of four sites on February 15, 2012 within the project corridor. These short-term measurements were collected using a Larson Davis System 824 Type I (precision) noise meter. Prior to noise monitoring, the noise meter was calibrated to 114 dB using CAL200 precision acoustic calibrator. Readings were in the A-weighted scale and were reported in decibels (dBA). The data collection procedure involved the Leq measurements in consecutive 10-second intervals. This method allows individual time intervals that include noise events unrelated to traffic noise (such as aircraft over flights) to be excluded from consideration. Data collected by the noise meter included time, average noise level (Leq), maximum noise level (Lmax), and instantaneous peak noise level (Lpk) for each interval. Hourly average noise levels (Leq (h)) were derived at each location from the 10 minute Leq values. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as wind speed, humidity, and ambient temperature. Measurements were conducted based on the acceptable collection of existing noise level readings according to the FHWA Report, FHWA-PD-96-046, "Measurement of Highway Related Noise."

A summary of the short-term noise monitoring results are presented in ***Table 2***. For each site, the table lists the assigned site number, the location and a description of the associated land use for each site, the monitored sound level, and the dominant sources of noise at each site. Ten minute traffic data (vehicle volume composition and speed) were also recorded on all roadways which were visible from the monitoring site and significantly contributed to the overall noise level. Traffic was grouped into one of the three categories: automobiles, medium trucks and heavy trucks, per VDOT procedure. The 10-minute traffic data was converted to one hour traffic data for validation of the noise model.

The location of each noise monitoring site in relation to the project roadway is shown on the graphics located on ***Figure 2***. The field data sheets are presented in ***Appendix B***. The monitored Leq in the study corridor ranged from 55.3 dBA to 68.7 dBA. Traffic noise from I-66 was the dominant source of noise within the study area.

Table 2: Short-term Noise Monitoring Summary

Site	Location	Land-use Description	Dominant Sources of Noise	Leq (dBA)
M1	Cul-de Sac – Antioch Access Road.	Undeveloped	I-66	61.1
M2	End of Blight Drive	Undeveloped	I-66	68.7
M3	Backyard of Residence on Stourcliffe Road	Backyard	I-66	55.3
M4	Basketball Court - Parks at Piedmont	Basketball Court	I-66	56.3

NOTE: Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every CNE to validate the computer noise model.

5.2 Noise Model Validation

The modeling process began with model validation, as per VDOT requirements. This was accomplished by comparing the monitored noise levels and the noise levels generated by the computer model, using traffic volumes and speeds that were encountered during the monitoring process. This validation ensures that reported changes between the existing and future design-year conditions are due to changes in traffic, and not discrepancies between monitoring and modeling techniques. A difference of 3 dBA or less between the monitored and modeled levels is considered acceptable, since this is the limit of change detectable by a typical human ear.

The model validation was performed for the existing traffic conditions. However, since no 24-hour monitoring was performed to obtain the existing loudest hour, the existing noise levels obtained during the 10 minute monitoring sessions were not reported as the project's existing noise levels. Instead, existing worst case hour noise levels obtained from TNM after model validation were used as the existing noise levels for the project area.

A summary of the model validation is provided in ***Table 3***. As shown, for the validated sites, the difference between the modeled and monitored noise levels ranges from +1.0 to +2.7 dBA. The predicted levels that were modeled in the TNM differ from the recorded levels due to the complex intervening terrain features that are difficult to accurately capture easily. However, the validated noise levels are within the acceptable ±3 dBA. With the sites validated, the existing condition model is considered to be calibrated for the observed site conditions.

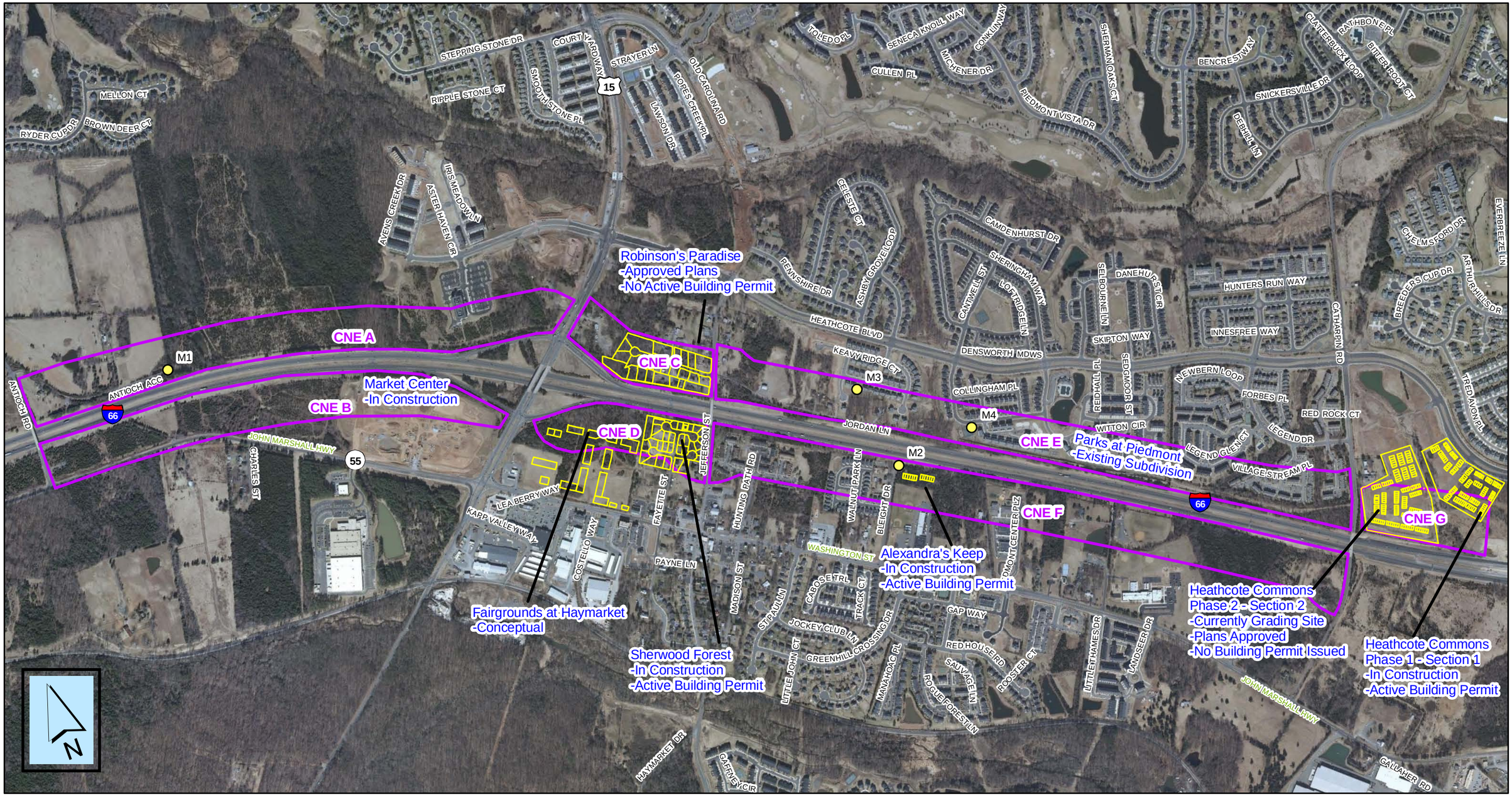
Table 3: Noise Model Validation

Site	Monitored Noise Level (dBA)	Computed Noise Level (dBA)	Difference (Computed – Monitored)
M1	61.1	63.8	+2.7
M2	68.7	69.7	+1.0
M3	55.3	57.0	+1.7
M4	56.3	59.0	+2.7

5.3 Modeled Existing Environment

For reporting purposes, the project area was divided into areas of Common Noise Environments (CNE). CNEs are defined as a group of receptors within the same Activity Category ***(Table 1)*** that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. In accordance with VDOT guidance, noise sensitive receptors within 500 feet of the construction limits are considered as part of the evaluation.

One hundred seventy-seven residences, the football/baseball field at the George G. Tyler Elementary School, two basketball courts and a playground at the Parks on Piedmont Community, represented by 84 noise sensitive sites are predicted to experience noise impact under the existing condition due to levels approaching or exceeding the NAC. For all studied sites, the existing year noise levels range from 43 to 73 dBA. A description of the CNEs is provided below. ***Figure 2*** shows the location of the CNE's described below. ***Appendix A*** contains graphics with all of the modeled receptor locations by CNE.



I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
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Virginia Department of Transportation

Monitoring Locations
CNE - Common Noise Environment

0 500 1,000 2,000 3,000 4,000 Feet

I-66 Widening Project
From SR 15 to SR 29

Prince William County and the Town of Haymarket

Figure 2
Monitoring Locations, Planned Developments, and Common Noise Environments (CNE)

CNE A – West of State Route 15 – North of I-66
CNE A is located along the north side of I-66 between Antioch Road and the I-66 / State Route 15 interchange. CNE A contains 3 single family residential properties represented by 3 noise sensitive sites (A01-A03,) with A01-A02 accessible from the Antioch Access Road, and A03 accessible from State Route 15. There is a medical facility in the northwest quadrant of the I-66 / SR 15 Interchange, however it was not modeled due to the lack of outdoor use facilities.

Existing noise levels within CNE A range from 58 to 59 dBA. None of these properties are predicted to be impacted by traffic noise under the existing condition. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE A. It was confirmed with the Town of Haymarket administration and Prince William County Planning Department that there are no known undeveloped lands with an active building permit located within this CNE.

CNE B –West of State Route 15 – South of I-66
CNE B is located along the south side of I-66 between Antioch Road and the I-66/ SR 15 interchange. CNE B contains 2 single family residences (Category B,) represented by 1 noise sensitive site, B01. The site is accessible from State Route 55 / John Marshall Hwy. There is a commercial building located south of I-66 accessible from Antioch Road, however it was not modeled due to the lack of outdoor use facilities. It is also noted at time of the study that a Walmart/Kohls are currently being constructed at the Market Center, located in the southwest quadrant of the I-66 / SR15 Interchange. However, since these types of stores are not known for having outdoor activity locations, they also were not studied.

Site B01 is predicted to have an existing noise level of 61 dBA. This property is predicted to be not impacted by traffic noise under the existing condition. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE B. It was confirmed with the Town of Haymarket administration and Prince William County Planning Department that there are no known undeveloped lands with an active building permit located within this CNE.

CNE C – East of State Route 15 – North of I-66
CNE C is located north of I-66, between State Route 15 and Old Carolina Road / Jefferson Street. CNE C contains 12 single family residences, represented by 10 noise sensitive sites, C01-C10, Sites C01-C03 are accessible from SR 15, while sites C04-C10 are located on Walter Robinson Lane. It is also noted at time of the study and confirmed with the Town of Haymarket administration that approved plats exist for the proposed development referred to as Robinson's Paradise, located along Walter Robinson Lane. The Town of Haymarket administration confirms that no building permit has been issued for this subdivision. Since no active building permit exists for Robinson's Paradise, it was not considered for noise abatement for this project. Noise abatement was only considered for the existing homes that are located in the proposed development, not for the empty lots.

Existing noise levels within CNE C range from 55 to 70 dBA. Four noise sensitive sites, representing 4 residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the existing condition. Impacted site C01 is located adjacent to State Route 15 and receives equal noise contributions from both I-66 and SR 15. Impacted sites C08-

C10 are located adjacent on Walter Robinson Lane, and are impacted by I-66. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE C.

CNE D – East of State Route 15 – South of I-66

CNE D is located south of I-66, between State Route 15 and Old Carolina Road/Jefferson Street. CNE D contains 32 single family residences, represented by 24 noise sensitive sites (D01-D24). It is also noted at time of the study a building permit exists for the Sherwood Forest Subdivision, and is currently under construction. The Prince William County Planning Department accepted a construction permit for the Sherwood Forest Development on August 3, 2011. Since development is under construction with an approved building permit, this subdivision was included for the consideration of noise abatement.

Existing noise levels within CNE D range from 54 to 73 dBA. Six noise sensitive sites, representing 8 residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the existing condition. Impacted sites D01-D06 are located in the Sherwood Forest Community, and are impacted by traffic noise from I-66. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE D. Confirmation with the Prince William County Planning Department shows a site concept exists for the Fairgrounds at Haymarket, a mixed residential / commercial development, located in the southeast quadrant of the I-66 / SR 15 interchange. Since the development is only at the conceptual stage, it was not considered for noise abatement.

CNE E – East of Old Carolina Road / Jefferson St– North of I-66

CNE E is located north of I-66, between Old Carolina Road/Jefferson Street and Catharpin Road. CNE E contains 359 single family residences, two playgrounds, and two basketball courts, represented by 118 noise sensitive sites (E001-E118). Site E001 represents a single family residence located off of Old Carolina Road. Sites E002-E004, E006-E007, and E010 represent single family residences accessible from Jordan Lane. Sites E005, E008-E009, E011-E024 represent single family residences along Wallasey Court, Keavy Ridge Court, and Stourcliffe Lane. Sites E025-E034 represent single family residences with outdoor backyard decks, located along Jansbury Street and Collingham Place. Sites E035-E043, E045-E051, E053-E071 represent 3-story multi-family townhomes along Shelford Way, Hampton Lane, Macon Grove Lane, Kylewood Way, and Sabbarton Place. Site E044 consists of a playground and a basketball court, while site E052 only represents a basketball court. Site E072 represents a playground. Sites E035-E072 are all part of the Parks of Piedmont Community. Sites E073-E080 represent 2-story multi-family townhomes with fenced-in ground floor backyard outdoor areas, located in Stanwick Square. Sites E081-E094 represent 2-story multi-family residences with 2nd floor outdoor backyard attached decks, located along Legend Glen Court and Avalon Isle Way. Sites E095-E112 represent 2-story multi-family residences with 2nd floor outdoor backyard attached decks, located along Village Stream Place, Springfield Court, and Creekbranch Way. Sites E113-E118 represent 2-story multi-family residences with 2nd floor outdoor backyard attached decks, located along Traditions Trail. It was confirmed with the Town of Haymarket administration and Prince William County Planning Department that there are no known undeveloped lands with an active building permit located within this CNE.

Existing noise levels within CNE E range from 54 to 73 dBA. Twenty-six noise sensitive sites, representing 64 residences, the basketball courts, and a playground at the Parks of Piedmont are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the existing condition. Impacted sites E003-E006, E010-E011, E044 (playground/basketball court), E052 (basketball court), E074, E083-E086, E091-E092, E095, E099-E105, E109, and E113-E114 are impacted by traffic noise from I-66. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE E.

CNE F – East of Old Carolina Road / Jefferson St– South of I-66

CNE F is located south of I-66, between Old Carolina Road/Jefferson Street and Catharpin Road. CNE F contains 159 single family residences, a playground, and several school athletic fields, represented by 120 noise sensitive sites (F001-F120). Sites F001-F037 represent 2-story multi-family townhomes with enclosed ground floor backyard outdoor areas, located along Hunting Path Road, Cheyenne Way, Brave Court, and Rising Sun Lane. Sites F038-F055 represent single family townhomes with backyard outdoor areas, located along Blight Drive, Sycamore Park Drive, Walnut Park Lane, and Dogwood Park Lane. Sites F056-F061 represent 3-story multi-family townhomes currently under construction, located off of Blight Drive represent the 12 residences of Alexandra's Keep community. Site F062 represents a playground for the Rainbow Station Child Care Center. Sites F063-F064 represent single family residences accessible from State Route 55/ John Marshall Hwy. Sites F065-F079 represent the baseball fields at Pace West School. Sites F080-F119 represent the football and baseball fields at the George G. Tyler Elementary School. Site F120 represents a single family home accessible from Catharpin Road. It was confirmed with the Town of Haymarket administration and Prince William County Planning Department that there are no other known undeveloped lands with an active building permit located within this CNE.

Existing noise levels within CNE F range from 43 to 72 dBA. Thirty-two noise sensitive sites, representing 42 residences and the athletics fields at the George G. Tyler Elementary School are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the existing condition. Impacted sites F001-F007, F010-F013, F038-F042, F057-F061, F064, F080-F085, F087, and F090-F092 are impacted by traffic noise from I-66. The ***Appendix A-1*** graphic shows all of the receptor locations in CNE F.

CNE G – East of Catharpin Road – North of I-66

CNE G is located north of I-66, east of Catharpin Road. CNE G contains 117 single family residences, represented by 30 noise sensitive sites, G01-G30. Sites G01-G21 represent 2-story multi-family townhomes with second floor outdoor balconies, located along Santa Cruz Place and Kona Drive. These townhomes are part of the Heathcote Commons Development (Phase 2, Section 2). While this area associated with Phase 2 Section 2 has an approved grading plan, it currently does not have an active building permit. Sites G22-G30 represent 2-story multi-family townhomes with second floor outdoor balconies and are located along Trek Way, Gary Fisher Trail, and Mongoose Trail. These townhomes are part of the Heathcote Commons Development (Phase 1, Section 1). At the time of the study these townhomes were in the process of being constructed.

Existing noise levels within CNE G range from 62 to 71 dBA. Sixteen noise sensitive sites, representing 59 residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the existing condition. Impacted sites G01-G10, G13-G14, and G17-G20 are impacted by traffic noise from I-66.

6. Future Noise Environment

Noise levels in the study area were predicted for the design year (2036) build condition, using the TNM. Design year no-build noise levels are not required for this traffic noise study because the project is not related to the interstate system and does not involve a "constructive use" 4(f) determination, as stated in the VDOT State Noise Abatement Policy. All noise sensitive sites were modeled under NAC Category B (residential) with outdoor activity areas.

Assessment of traffic noise impact requires these comparisons:

(1) The noise levels under existing conditions must be compared to those under design year build conditions. This comparison shows the change in noise levels that will occur between the existing year and the design year if the project is constructed, to determine if the substantial increase impact criteria has been met.

(2) The noise levels under design year build conditions must be compared to the applicable NAC. This comparison determines if the impact criteria has been met under future build conditions and can be used to assist in noise compatible land use planning.

Noise impacts are predicted under the design year build condition (2036) due to noise levels approaching or exceeding the NAC. Calculated noise levels for all noise sensitive sites and conditions are listed in ***Table 4***. Descriptions of each CNE are included in ***Section 5.3***.

6.1 Build Alternative

One hundred seventy-nine residences, the football/baseball field at the George G. Tyler Elementary School, two basketball courts and a playground at the Parks on Piedmont Community, and a playground at the Rainbow Station Child Care Center represented by 84 noise sensitive sites are predicted to experience noise impact under the design year (2036) build noise levels. Noise levels are predicted to range from 45 to 75 dBA.

CNE A – West of State Route 15 – North of I-66

Design year (2036) build noise levels within CNE A are predicted to range from 61 to 62 dBA. These noise sensitive locations are not predicted to be impacted by traffic noise under the future design year (2036) build condition.

CNE B – West of State Route 15 – South of I-66

Site B01 (CNE B) is predicted to have a design year (2036) build noise level of 63 dBA. This noise sensitive location is not predicted to be impacted by traffic noise under the future design year (2036) build condition.

CNE C – East of State Route 15 – North of I-66
Design year (2036) build noise levels within CNE C are predicted to range from 62 to 75 dBA. Five noise sensitive sites representing five residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the design year build condition. Impacted sites C01-C02 are located adjacent to State Route 15 and receive equal noise contributions from both I-66 and SR 15. Impacted sites C08 -C10 are located along Walter Robinson Lane and are impacted by I-66.

CNE D – East of State Route 15 – South of I-66
Design year (2036) build noise levels within CNE D are predicted to range from 57 to 73 dBA. Seven noise sensitive sites representing nine residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the design year build condition. Impacted sites D01-D07 are located in the Sherwood Forest Community and are impacted by traffic noise from I-66.

CNE E – East of Old Carolina Road / Jefferson St– North of I-66
Design year (2036) build noise levels within CNE E are predicted to range from 45 to 73 dBA. Forty-one noise sensitive sites, representing 114 residences, the basketball courts, and a playground are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the design year build condition. Impacted sites E003-E007, E009-E012, E025, E044 (playground/basketball court), E047-E048, E051, E052 (basketball court), E053-E055, E073-E074, E083-E086, E091-E092, E095, E099-E105, E109-E110, E113-E114, and E117-E118 are impacted by traffic noise from I-66.

CNE F – East of Old Carolina Road / Jefferson St– South of I-66
Design year (2036) build noise levels within CNE F are predicted to range from 45 to 74 dBA. Forty-one noise sensitive sites, representing 50 residences, the playground at Rainbow Station, and the athletics fields at the George G. Tyler Elementary School are predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the design year build condition. Impacted sites F001-F008, F010-F013, F038-F043, F047, F056-F062, F064, F080-F092, and F097 are impacted by traffic noise from I-66.

CNE G – East of Catharpin Road – North of I-66
Design year (2036) build noise levels within CNE G are predicted to range from 47 to 66 dBA. One noise sensitive site, representing 3 residences, is predicted to experience noise impacts due to levels approaching or exceeding the NAC, under the design year build condition. Impacted site G08 is impacted by traffic noise from I-66. The placement of the outdoor balconies was estimated based on the orientation of the buildings that were constructed, as part of Phase 1 for this development.

Table 4: Predicted Noise Levels

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
CNE A – West of State Route 15 – North of I-66						
A01	Residential	1	59	62	66	No
A02	Residential	1	58	61	66	No
A03	Residential	1	59	61	66	No
CNE B – West of State Route 15 – South of I-66						
B01	Residential	2	61	63	66	No
CNE C – East of State Route 15 – North of I-66						
C01	Residential	1	69	72	66	Yes
C02	Residential	1	61	66	66	Yes
C03	Residential	1	61	65	66	No
C04	Residential	1	61	64	66	No
C05	Residential	2	62	65	66	No
C06	Residential	2	55	62	65	No
C07	Residential	1	57	64	66	No
C08	Residential	1	70	75	66	Yes
C09	Residential	1	68	73	66	Yes
C10	Residential	1	66	71	66	Yes
CNE D – East of State Route 15 – South of I-66						
D01	Residential	1	70	72	66	Yes
D02	Residential	2	72	73	66	Yes
D03	Residential	2	73	73	66	Yes
D04	Residential	1	71	73	66	Yes
D05	Residential	1	67	70	66	Yes
D06	Residential	1	66	68	66	Yes
D07	Residential	1	63	66	66	Yes
D08	Residential	2	60	63	66	No
D09	Residential	1	61	65	66	No
D10	Residential	1	60	63	66	No
D11	Residential	1	59	62	66	No
D12	Residential	1	58	61	66	No
D13	Residential	1	60	63	66	No
D14	Residential	1	59	62	66	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
D15	Residential	1	59	61	66	No
D16	Residential	3	57	60	66	No
D17	Residential	2	57	60	66	No
D18	Residential	1	59	61	66	No
D19	Residential	1	55	58	65	No
D20	Residential	1	54	57	64	No
D21	Residential	2	55	58	65	No
D22	Residential	2	56	59	66	No
D23	Residential	1	62	64	66	No
D24	Residential	1	60	62	66	No
CNE E – East of Old Carolina Road / Jefferson St– North of I-66						
E001	Residential	1	63	65	66	No
E002	–Commercial - Vacant	0	64	67	71	No
E003	Residential	1	68	70	66	Yes
E004	Residential	1	67	70	66	Yes
E005	Residential	1	67	71	66	Yes
E006	Residential	1	66	70	66	Yes
E007	Residential	1	65	68	66	Yes
E008	Residential	1	60	64	66	No
E009	Residential	2	63	68	66	Yes
E010	Residential	1	67	72	66	Yes
E011	Residential	1	66	68	66	Yes
E012	Residential	1	64	66	66	Yes
E013	Residential	1	61	64	66	No
E014	Residential	1	59	62	66	No
E015	Residential	1	57	61	66	No
E016	Residential	1	60	64	66	No
E017	Residential	2	56	61	66	No
E018	Residential	2	59	63	66	No
E019	Residential	2	59	63	66	No
E020	Residential	2	57	60	66	No
E021	Residential	2	54	57	64	No
E022	Residential	10	52	55	62	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
E023	Residential	1	61	65	66	No
E024	Residential	3	58	62	66	No
E025	Residential	2	65	69	66	Yes
E026	Residential	2	62	65	66	No
E027	Residential	2	59	63	66	No
E028	Residential	2	57	61	66	No
E029	Residential	1	61	64	66	No
E030	Residential	2	59	62	66	No
E031	Residential	1	56	59	66	No
E032	Residential	2	55	57	65	No
E033	Residential	2	53	55	63	No
E034	Residential	2	51	54	61	No
E035	Residential	4	58	60	66	No
E036	Residential	4	57	60	66	No
E037	Residential	4	57	59	66	No
E038	Residential	4	56	58	66	No
E039	Residential	4	55	58	65	No
E040	Residential	4	55	59	65	No
E041	Residential	4	57	60	66	No
E042	Residential	4	59	62	66	No
E043	Residential	4	58	61	66	No
E044	Playground / Basketball Court – Parks at Piedmont	1	67	70	66	Yes
E045	Residential	2	60	63	66	No
E046	Residential	2	61	64	66	No
E047	Residential	4	64	67	66	Yes
E048	Residential	4	63	67	66	Yes
E049	Residential	4	60	63	66	No
E050	Residential	4	59	63	66	No
E051	Residential	4	65	69	66	Yes
E052	Basketball Court – Parks at Piedmont	1	68	73	66	Yes
E053	Residential	8	61	66	66	Yes
E054	Residential	4	65	69	66	Yes

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
E055	Residential	4	63	68	66	Yes
E056	Residential	4	58	62	66	No
E057	Residential	4	59	62	66	No
E058	Residential	4	61	63	66	No
E059	Residential	4	57	61	66	No
E060	Residential	4	54	57	64	No
E061	Residential	4	53	56	63	No
E062	Residential	4	51	54	61	No
E063	Residential	4	57	61	66	No
E064	Residential	4	55	58	65	No
E065	Residential	4	54	57	64	No
E066	Residential	4	54	57	64	No
E067	Residential	4	52	55	62	No
E068	Residential	4	51	53	61	No
E069	Residential	4	55	58	65	No
E070	Residential	4	53	56	63	No
E071	Residential	4	52	54	62	No
E072	Playground – Parks at Piedmont	1	50	53	60	No
E073	Residential	6	65	68	66	Yes
E074	Residential	6	70	73	66	Yes
E075	Residential	3	51	54	61	No
E076	Residential	3	47	49	57	No
E077	Residential	2	61	65	66	No
E078	Residential	3	58	62	66	No
E079	Residential	3	57	60	66	No
E080	Residential	3	53	57	63	No
E081	Residential	3	63	66	66	Yes
E082	Residential	4	57	61	66	No
E083	Residential	3	67	70	66	Yes
E084	Residential	4	70	72	66	Yes
E085	Residential	4	70	72	66	Yes
E086	Residential	3	70	72	66	Yes
E087	Residential	3	43	45	53	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
E088	Residential	4	50	52	60	No
E089	Residential	4	43	45	53	No
E090	Residential	3	43	45	53	No
E091	Residential	4	68	70	66	Yes
E092	Residential	3	66	68	66	Yes
E093	Residential	4	62	64	66	No
E094	Residential	3	59	62	66	No
E095	Residential	3	67	68	66	Yes
E096	Residential	3	62	63	66	No
E097	Residential	3	60	62	66	No
E098	Residential	3	57	59	66	No
E099	Residential	2	69	71	66	Yes
E100	Residential	3	71	72	66	Yes
E101	Residential	3	71	73	66	Yes
E102	Residential	3	71	73	66	Yes
E103	Residential	3	71	73	66	Yes
E104	Residential	3	71	73	66	Yes
E105	Residential	4	71	73	66	Yes
E106	Residential	8	53	56	63	No
E107	Residential	8	45	47	55	No
E108	Residential	6	59	62	66	No
E109	Residential	2	69	71	66	Yes
E110	Residential	3	63	66	66	Yes
E111	Residential	3	60	64	66	No
E112	Residential	4	59	63	66	No
E113	Residential	3	67	70	66	Yes
E114	Residential	2	66	69	66	Yes
E115	Residential	4	53	56	63	No
E116	Residential	3	62	65	66	No
E117	Residential	2	63	66	66	Yes
E118	Residential	2	64	67	66	Yes
CNE F – East of Old Carolina Road / Jefferson St– South of I-66						
F001	Residential	2	68	69	66	Yes
F002	Residential	2	68	69	66	Yes

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
F003	Residential	2	68	69	66	Yes
F004	Residential	2	68	71	66	Yes
F005	Residential	2	69	72	66	Yes
F006	Residential	2	70	72	66	Yes
F007	Residential	2	71	72	66	Yes
F008	Residential	2	65	68	66	Yes
F009	Residential	2	62	65	66	No
F010	Residential	2	67	69	66	Yes
F011	Residential	2	67	69	66	Yes
F012	Residential	2	67	69	66	Yes
F013	Residential	2	67	70	66	Yes
F014	Residential	2	63	65	66	No
F015	Residential	2	61	64	66	No
F016	Residential	2	59	62	66	No
F017	Residential	1	59	62	66	No
F018	Residential	2	62	65	66	No
F019	Residential	4	61	63	66	No
F020	Residential	3	59	62	66	No
F021	Residential	7	57	60	66	No
F022	Residential	2	57	60	66	No
F023	Residential	2	55	58	65	No
F024	Residential	5	50	53	60	No
F025	Residential	5	45	47	55	No
F026	Residential	3	57	60	66	No
F027	Residential	3	53	56	63	No
F028	Residential	2	60	64	66	No
F029	Residential	2	59	63	66	No
F030	Residential	2	59	63	66	No
F031	Residential	2	61	63	66	No
F032	Residential	5	56	59	66	No
F033	Residential	8	47	48	57	No
F034	Residential	6	43	45	53	No
F035	Residential	8	43	45	53	No
F036	Residential	3	60	61	66	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
F037	Residential	3	58	60	66	No
F038	Residential	1	72	73	66	Yes
F039	Residential	2	71	73	66	Yes
F040	Residential	3	71	73	66	Yes
F041	Residential	2	72	73	66	Yes
F042	Residential	1	69	71	66	Yes
F043	Residential	1	63	67	66	Yes
F044	Residential	1	62	63	66	No
F045	Residential	2	62	63	66	No
F046	Residential	2	60	61	66	No
F047	Residential	3	63	66	66	Yes
F048	Residential	1	61	64	66	No
F049	Residential	3	58	60	66	No
F050	Residential	1	61	64	66	No
F051	Residential	2	56	59	66	No
F052	Residential	2	54	57	64	No
F053	Residential	2	53	56	63	No
F054	Residential	1	58	61	66	No
F055	Residential	4	54	57	64	No
F056	Residential	2	65	68	66	Yes
F057	Residential	2	66	68	66	Yes
F058	Residential	2	67	68	66	Yes
F059	Residential	2	68	69	66	Yes
F060	Residential	2	68	69	66	Yes
F061	Residential	2	68	69	66	Yes
F062	Playground – Rainbow Station	1	64	69	66	Yes
F063	Residential	1	58	61	66	No
F064	Residential	1	68	71	66	Yes
F065	Baseball Field	1	56	59	66	No
F066	Baseball Field	1	52	55	62	No
F067	Baseball Field	1	58	57	66	No
F068	Baseball Field	1	58	58	66	No
F069	Baseball Field	1	60	61	66	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
F070	Baseball Field	1	54	57	64	No
F071	Baseball Field	1	53	56	63	No
F072	Baseball Field	1	57	58	66	No
F073	Baseball Field	1	57	58	66	No
F074	Baseball Field	1	57	58	66	No
F075	Baseball Field	1	53	56	63	No
F076	Baseball Field	1	53	56	63	No
F077	Baseball Field	1	56	57	66	No
F078	Baseball Field	1	56	57	66	No
F079	Baseball Field	1	55	57	65	No
F080	Football / Baseball Field	1	72	74	66	Yes
F081	Football / Baseball Field	1	70	71	66	Yes
F082	Football / Baseball Field	1	70	71	66	Yes
F083	Football / Baseball Field	1	71	72	66	Yes
F084	Football / Baseball Field	1	72	74	66	Yes
F085	Football / Baseball Field	1	70	72	66	Yes
F086	Football / Baseball Field	1	65	69	66	Yes
F087	Football / Baseball Field	1	67	70	66	Yes
F088	Football / Baseball Field	1	63	66	66	Yes
F089	Football / Baseball Field	1	64	67	66	Yes
F090	Football / Baseball Field	1	66	68	66	Yes
F091	Football / Baseball Field	1	67	69	66	Yes
F092	Football / Baseball Field	1	66	67	66	Yes
F093	Football / Baseball Field	1	61	65	66	No
F094	Football / Baseball Field	1	60	62	66	No
F095	Football / Baseball Field	1	61	63	66	No
F096	Football / Baseball Field	1	62	64	66	No

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
F097	Football / Baseball Field	1	63	66	66	Yes
F098	Football / Baseball Field	1	61	63	66	No
F099	Baseball Field	1	58	62	66	No
F100	Baseball Field	1	59	63	66	No
F101	Baseball Field	1	59	61	66	No
F102	Baseball Field	1	60	62	66	No
F103	Baseball Field	1	58	60	66	No
F104	Baseball Field	1	60	62	66	No
F105	Baseball Field	1	56	60	66	No
F106	Baseball Field	1	57	60	66	No
F107	Baseball Field	1	57	60	66	No
F108	Baseball Field	1	58	60	66	No
F109	Baseball Field	1	57	59	66	No
F110	Baseball Field	1	58	60	66	No
F111	Baseball Field	1	57	59	66	No
F112	Baseball Field	1	57	60	66	No
F113	Baseball Field	1	57	60	66	No
F114	Baseball Field	1	59	61	66	No
F115	Baseball Field	1	60	62	66	No
F116	Baseball Field	1	59	62	66	No
F117	Baseball Field	1	62	64	66	No
F118	Baseball Field	1	63	65	66	No
F119	Baseball Field	1	62	64	66	No
F120	Residential	1	61	65	66	No
CNE G – East of Catharpin Road – North of I-66						
G01	Residential	3	69	63	66	No
G02	Residential	3	68	58	66	No
G03	Residential	3	69	55	66	No
G04	Residential	3	70	54	66	No
G05	Residential	3	70	54	66	No
G06	Residential	3	70	55	66	No
G07	Residential	3	70	56	66	No
G08	Residential	3	71	66	66	Yes

Receptor Number	Land Use	No. of Dwelling Units	Modeled Noise Levels		Noise Abatement Criteria*	Abatement Considered
			Existing	Build 2036		
G09	Residential	5	67	49	66	No
G10	Residential	5	66	53	66	No
G11	Residential	5	65	61	66	No
G12	Residential	5	64	63	66	No
G13	Residential	3	68	58	66	No
G14	Residential	5	66	55	66	No
G15	Residential	6	65	52	66	No
G16	Residential	3	64	51	66	No
G17	Residential	3	67	49	66	No
G18	Residential	5	67	49	66	No
G19	Residential	4	67	50	66	No
G20	Residential	5	68	59	66	No
G21	Residential	5	63	60	66	No
G22	Residential	3	64	63	66	No
G23	Residential	4	62	59	66	No
G24	Residential	5	63	48	66	No
G25	Residential	6	63	47	66	No
G26	Residential	4	63	48	66	No
G27	Residential	6	64	48	66	No
G28	Residential	2	65	65	66	No
G29	Residential	2	65	62	66	No
G30	Residential	2	64	60	66	No
Number of Noise Impacts						
			189	197		
Noise Level Ranges						
		Minimum	43	45		
		Maximum	73	75		
*	Criteria based on NAC or substantial increase, whichever is lower					
(#)	Indicates indoor noise levels					
	Indicates noise impact					

7. Noise Abatement

Predicted future design noise levels were predicted for the design year build condition due to levels approaching or exceeding the NAC. Therefore, per VDOT's State Noise Abatement Policy, noise abatement considerations are warranted for these impacted noise sensitive areas.

7.1 Abatement Measures Evaluation

VDOT guidelines recommend a variety of mitigation measures that should be considered in response to transportation-related noise impacts. While noise barriers and/or earth berms are generally the most effective form of noise mitigation, additional mitigation measures exist which have the potential to provide considerable noise reductions, under certain circumstances. Mitigation measures considered for this project include:

- Traffic management
- Alignment modifications;
- Acoustical insulation of public use and non-profit facilities;
- Buffer lands
- Construction of noise barriers;
- Construction of earth berms;

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) states: *Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.* Consideration will be given to these measures during the final design stage, where feasible. The response from project management is included in ***Appendix C.***

Traffic Control Measures (TCM): Traffic control measures, such as speed limit restrictions, truck traffic restrictions, and other traffic control measures that may be considered for the reduction of noise emission levels are not practical for this project. These traffic control measures would be counterproductive to the project's objective of alleviating traffic and reducing congestion. Reducing speeds will not be an effective noise mitigation measure since a substantial decrease in speed is necessary to provide adequate noise reduction. Typically, a 10 mph reduction in speed will result in only a 2 dBA decrease in noise level, which would not eliminate all impacts.

Alteration of Horizontal and Vertical Alignments: The alteration of the horizontal and vertical alignment has been considered to reduce or eliminate the impacts created by the proposed project. Shifting the horizontal alignment to the outside or inside will create undesirable impacts such as right-of-way acquisition, temporary/permanent easements, and retaining walls. Shifting the roadway alignment away from the impacted residences will increase impacts to other residences located on the opposite side of the interstate

Insulation: This noise abatement measure option applies only to public and institutional use buildings. Since no public use or institutional structures are anticipated to have interior noise levels exceeding FHWA's interior NAC, this noise abatement option will not be applied.

Acquisition of Buffering Land: The purchase of property and/or buildings for noise barrier construction or the creation of a "buffer zone" to reduce noise impacts is only considered for predominantly unimproved properties because the amount of property required for this option to be effective would create significant additional impacts (*e.g.*, in terms of residential displacements), which were determined to outweigh the benefits of land acquisition.

Construction of Noise Barriers / Berms:
Construction of noise barriers can be an effective way to reduce noise levels at areas of outdoor activity. Noise barriers can be wall structures, earthen berms, or a combination of the two. The effectiveness of a noise barrier depends on the distance and elevation difference between roadway and receptor and the available placement location for a barrier. Gaps between overlapping noise barriers also decrease the effectiveness of the barrier, as opposed to a single connected barrier. The barrier's ability to attenuate noise decreases as the gap width increases.

Noise walls and earth berms are often implemented into the highway design in response to the identified noise impacts. The effectiveness of a freestanding (post and panel) noise barrier and an earth berm of equivalent height are relatively consistent; however an earth berm is perceived as a more aesthetically pleasing option. The use of earth berms is not always an option due to the excessive space they require adjacent to the roadway corridor. At a standard slope of 2:1, every one-foot in height would require four feet of horizontal width. This requirement becomes more complex in urban settings where residential properties often about the proposed roadway corridor. In these situations, implementation of earth berms can require significant property acquisitions to accommodate noise mitigation. The cost associated with the acquisition of property to construct a berm can significantly increase the total costs to implement this form of noise mitigation.

Availability of fill material to construct the berm also needs to be considered. On proposed projects where proposed grading yields excess waste material, earth berms are often cost effective mitigation options. On balance or borrow projects the implementation of earth berms is often an expensive solution due to the need to identify, acquire, and transport the material to the project site. Earth berms may be considered a viable mitigation option throughout the project area, and would be evaluated further where possible in the final design stage.

As a general practice, noise barriers are most effective when placed at a relatively high point between the roadway and the impacted noise sensitive land use. To achieve the greatest benefit from a potential noise barrier, the goal of the barrier should focus on breaking the line-of-sight (to the greatest degree possible) from the roadway to the receptor. In roadway fill conditions, where the highway is above the natural grade, noise barriers are typically most effective when placed on the edge of the roadway shoulder or on top of the fill slope. In roadway cut conditions, where the roadway is located below the natural grade, barriers are typically most effective when placed at the top of the cut slope. Engineering and safety issues have the potential to alter these typical barrier locations.

The effectiveness of a noise barrier is measured by examining the barrier's capability to reduce future noise levels. Noise reduction is measured by comparing design year pre- and post-barrier noise levels. This difference between unabated and abated noise levels is known as insertion loss (IL). The following discussion presents potential mitigation measures for each of the impacted noise sensitive land uses.

According to VDOT guidelines, potential mitigation measures must also be assessed for feasibility and reasonableness. Noise barrier feasibility deals specifically with acoustical and engineering considerations such as:

- Noise barriers must reduce design year noise levels by 5 dBA (or more) for fifty percent (50%) (or more) of impacted sites;
- The barrier must be possible to design and construct, based on factors such as safety, barrier height, topography, drainage, utilities, maintenance, and access to adjacent properties.

Noise barrier reasonableness is determined by assessing multiple issues including:

- The viewpoints of the benefited receptors
- Cost effectiveness value, based on a square foot cost ceiling (maximum square footage of abatement per benefited receptor)
- Noise reduction design goal of 7 dBA of insertion loss for at least one impacted receptor

Typically, the limiting factor related to barrier reasonableness is the cost effectiveness value, where the total surface area of the barrier is divided by the number of benefited receptors receiving at least a 5 dBA reduction in noise level. VDOT's approved cost is based on a maximum square footage of abatement per benefited receptor, a value of 1,600 square feet per benefited receptor.

For non-residential properties such as parks and public use facilities, a special calculation is preformed in order to quantify the type and duration of activity and compare to the cost effectiveness criterion. The determination is based on cost, severity of impact (both in terms of noise levels and the size of the impacted area and the activity it contains), and amount of noise reduction.

Noise barriers were evaluated in all areas predicted to experience noise impact in the build condition. Six noise barriers systems were evaluated at 6 different locations. Four of the six evaluated barriers were found to be both feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. A price of $45 per square feet was used to calculate the noise barrier's cost. Discussions of the individual barriers are listed below. The barrier locations are shown on the graphics located in ***Appendix A***. An overview of the six evaluated barrier parameters is shown in ***Table 5***. Details of the barrier insertion loss associated with each evaluated barrier are listed in ***Table 6***. Warranted, Feasible, and Reasonable Worksheets were completed for each barrier and were included in ***Appendix D***. ***Table 7*** contains the barrier descriptions for the four feasible and reasonable barriers.

Barrier 1
Barrier 1 is located within CNE C and extends along the right-of-way of the west bound lanes of I-66, approximately from Station 129+00 to 136+45. Barrier 1 has panel heights ranging from 6-13 feet and a total length of 877 feet, resulting in a surface area of 6,684 square feet. The barrier would benefit all 3 of the impacted sites (C08-C10), and not benefit any additional non-impacted sites. This results in a ratio of 2,228 square feet per benefited receptor. This barrier is considered feasible but not reasonable in accordance with VDOT's State Noise Abatement Policy. Noise abatement was only considered for the existing homes that are located in the proposed development, not for the empty lots.

Barrier System 2
Barrier System 2 is located within CNE E, and extends along the right-of-way of the west bound lanes of I-66, approximately from Station 146+00 to 205+30. Barrier System 2 is comprised of 4 overlapping barriers. Barrier 2-1 extends from approximately from Station 146+00 to 171+20 with panels ranging in height of 11-28 feet and a length of 2,530 feet, resulting in a surface area of 38,867 square feet. Barrier 2-2 extends from approximately from Station 170+45 to 186+75 with panels ranging in height of 9-22 feet and a length of 1,639 feet, resulting in a surface area of 26,057 square feet. Barrier 2-3 extends from approximately from Station 186+25 to 199+75 with panels ranging in height of 10-27 feet and a length of 1,356 feet, resulting in a surface area of 25,829 square feet. Barrier 2-4 extends from approximately from Station 199+25 to 205+30 with panels ranging in height of 9-22 feet and a length of 611 feet, resulting in a surface area of 9,393 square feet. The barrier system would have an average height of 16ft. totaling 6,136 feet in length and have a total surface area of 100,146 square feet. The barriers in this system were segmented to provide access to storm water detention ponds that would be constructed as part of the project. The barrier would benefit 38 of the 41 impacted sites representing a playground / basketball court (E044,) a basketball court (E052,) and 114 residences, E003-E007, E009-E011, E025, E047-E048, E051, E053-E055, E073-E074, E081, E083-E086, E091-E092, E095, E099-E105, E109-E110, and E113- E114). The barrier would also benefit 143 additional non-impacted residences, represented by sites E008, E017, E023-E024, E026-E033, E035-E043, E045, E059-E064, E067, E077-E080, E082, E088, E093-E094, E096-E098, E106, E108, and E111-E112. This results in a ratio of 394 square feet per benefited receptor. This barrier (system) is considered feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. Impacted sites E117-E118 were not considered benefits because of the noise contribution they receive from Catharpin Road.

Barrier 3
Barrier 3 is located within CNE G, and extends along the right-of-way of the west bound lanes of I-66, approximately from Station 207+00 to 218+00. Barrier 3 has panel heights ranging from 9-29 feet and a total length of 1,503 feet, resulting in a surface area of 22,077 square feet. The barrier would benefit all three of the impacted residences (Site G08). The barrier would also benefit 27 additional non-impacted residences, represented by sites G14-G16, G22-G23, G28-G30. This results in a ratio of 736 square feet per benefited receptor. This barrier is considered feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. The construction of Barrier 3 is conditional based on the Heathcote Commons (Phase 2 Section 2) Development obtaining an active building permit by the date of public knowledge.

Barrier 4
Barrier 4 is located within CNE D, and extends along the right-of-way of the east bound lanes of I-66, approximately from Station 329+00 to 337+00. Barrier 4 has panel heights ranging from 8-19 feet and a total length of 800 feet, resulting in a surface area of 12,272 square feet. The barrier would benefit eight of the nine impacted residences (Sites D01-D04, and D06-D07). The barrier would also benefit four additional non-impacted residences, represented by sites D08-D10. This results in a ratio of 1,023 square feet per benefited receptor. This barrier is considered feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. Impacted site D005 was not benefited because of the noise contribution it receives from Old Carolina Road/Jefferson Street.

Barrier 5
Barrier 5 is located within CNE F, and extends along the right-of-way of the east bound lanes of I-66, approximately from Station 338+00 to 389+00. Barrier 5 has panel heights ranging from 10-30 feet and a total length of 5,116 feet, resulting in a surface area of 92,051 square feet. The barrier would benefit 40 of the 41 impacted sites representing the football and baseball fields at the George G. Tyler Elementary School (F080-F092,) the playground at the Rainbow Station child care center (F062,) and 50 residences (F001-F008, F010-F013, F038-F043, F048, F056-F061, and F064). The barrier would also benefit 25 additional non-impacted sites, representing the baseball fields at Pace West School (F069 and F074,) the football and baseball fields at the George G. Tyler Elementary School (F093,) and 52 residences (F009, F018-F023, F026-F030, F036-F037, F045-F047, F049-F051, F054, and F063). This results in a ratio of 774 square feet per benefited receptor. This barrier is considered feasible and reasonable in accordance with VDOT's State Noise Abatement Policy.

Barrier 6
Barrier 6 is located within CNE C, and extends along the right-of-way of the I-66 off ramp, approximately from ramp Station 507+00 to 509+00 to approximately wrapping onto State Route 15 and ending at approximately 230+75. Barrier 6 has a uniform height of 12 feet and a total length of 441 feet, resulting in a surface area of 5,286 square feet. The barrier would benefit the only impacted residence (Site C01). The barrier would not benefit any additional non-impacted residences. This results in a ratio of 5,286 square feet per benefited receptor. This barrier is considered feasible but not reasonable in accordance with VDOT's State Noise Abatement Policy.

Table 5: Evaluated Noise Barrier Parameters

Barrier	Insertion Loss (IL)	Height (Range) (ft)	Total Length (ft)	Total Area (SF)	Benefitted	Area/Benefitted	Cost ($45/ft^2)
Barrier 1	0-7	6-13	877	6,684	3	2,228	$300,793
Barrier System 2	0-13	9-27	6,136	100,146	254	394	$4,506,574
Barrier 3	0-8	9-29	1,503	22,077	30	736	$993,450
Barrier 4	0-11	8-19	800	12,272	12	1,023	$552,257
Barrier 5	0-13	10-30	5,116	92,051	119	774	$4,142,304
Barrier 6	1-8	12	441	5,286	1	5,286	$237,878

Table 6: Noise Barrier Insertion Loss

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
Barrier 1 Summary				
C04	1	64	64	0
C05	2	65	65	0
C06	2	62	61	1
C07	1	64	63	1
C08	1	75	68	7
C09	1	73	68	5
C10	1	71	66	5
Barrier 2 Summary				
E003	1	70	64	6
E004	1	70	63	7
E005	1	71	63	8
E006	1	70	63	8
E007	1	68	63	6
E008	1	64	59	5
E009	2	68	61	7
E010	1	72	61	12
E011	1	68	63	5
E012	1	66	62	4
E013	1	64	60	4
E014	1	62	59	4
E015	1	61	58	3

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
E016	1	64	60	4
E017	2	61	56	5
E018	2	63	59	4
E019	2	63	59	4
E020	2	60	57	4
E021	2	57	53	4
E022	10	55	52	3
E023	1	65	58	7
E024	3	62	55	7
E025	2	69	57	12
E026	2	65	55	10
E027	2	63	56	7
E028	2	61	54	7
E029	1	64	57	7
E030	2	62	56	6
E031	1	59	53	5
E032	2	57	52	5
E033	2	55	51	5
E034	2	54	50	4
E035	4	60	54	6
E036	4	60	53	6
E037	4	59	53	6
E038	4	58	53	6
E039	4	58	53	6
E040	4	59	52	6
E041	4	60	53	7
E042	4	62	54	8
E043	4	61	54	7
E044	1	70	61	9
E045	2	63	58	5
E046	2	64	60	4
E047	4	67	61	6
E048	4	67	61	6
E049	4	63	60	3
E050	4	63	60	3
E051	4	69	59	9

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
E052	1	73	61	12
E053	8	66	56	10
E054	4	69	58	11
E055	4	68	59	9
E056	4	62	58	4
E057	4	62	59	3
E058	4	63	60	3
E059	4	61	53	7
E060	4	57	51	6
E061	4	56	50	6
E062	4	54	49	5
E063	4	61	54	7
E064	4	58	53	5
E065	4	57	53	4
E066	4	57	53	4
E067	4	55	50	5
E068	4	53	49	4
E069	4	58	54	4
E070	4	56	53	4
E071	4	54	51	4
E072	1	53	49	4
E073	6	68	61	7
E074	6	73	62	11
E075	3	54	50	4
E076	3	49	47	2
E077	2	65	56	9
E078	3	62	54	9
E079	3	60	52	8
E080	3	57	50	7
E081	3	66	54	12
E082	4	61	49	12
E083	3	70	58	12
E084	4	72	60	12
E085	4	72	59	13
E086	3	72	59	13
E087	3	45	44	1

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
E088	4	52	46	6
E089	4	45	43	2
E090	3	45	43	2
E091	4	70	57	13
E092	3	68	55	13
E093	4	64	53	11
E094	3	62	51	11
E095	3	68	56	13
E096	3	63	53	10
E097	3	62	52	10
E098	3	59	51	8
E099	2	71	60	11
E100	3	72	62	10
E101	3	73	62	11
E102	3	73	62	11
E103	3	73	62	11
E104	3	73	63	10
E105	4	73	63	10
E106	8	56	49	7
E107	8	47	44	3
E108	6	62	53	9
E109	2	71	62	9
E110	3	66	59	7
E111	3	64	56	8
E112	4	63	56	7
E113	3	70	62	8
E114	2	69	63	7
E115	4	56	56	0
E116	3	65	65	0
E117	2	66	66	0
E118	2	67	66	1
Barrier 3 Summary				
G01	3	63	63	0
G02	3	58	57	0
G03	3	55	55	0
G04	3	54	54	0

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
G05	3	54	54	1
G06	3	55	54	1
G07	3	56	55	1
G08	3	66	59	7
G09	5	49	49	0
G10	5	53	53	0
G11	5	61	61	0
G12	5	63	63	0
G13	3	58	55	4
G14	5	55	49	6
G15	6	52	47	6
G16	3	51	46	5
G17	3	49	48	0
G18	5	49	48	0
G19	4	50	49	1
G20	5	59	58	0
G21	5	60	56	4
G22	3	63	58	6
G23	4	59	51	8
G24	5	48	44	3
G25	6	47	44	3
G26	4	48	44	3
G27	6	48	45	3
G28	2	65	60	5
G29	2	62	55	7
G30	2	60	53	7
Barrier 4 Summary				
D01	1	72	62	10
D02	2	73	62	11
D03	2	73	62	11
D04	1	73	64	8
D05	1	70	67	3
D06	1	68	61	7
D07	1	66	61	5
D08	2	63	57	6
D09	1	65	58	7

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
D10	1	63	58	5
D11	1	62	58	4
D12	1	61	58	4
D13	1	63	62	1
D14	1	62	58	4
D15	1	61	59	3
D16	3	60	57	4
D17	2	60	56	4
D18	1	61	61	1
D19	1	58	56	2
D20	1	57	56	1
D21	2	58	56	2
D22	2	59	57	2
D23	1	64	64	0
D24	1	62	62	0
Barrier 5 Summary				
F001	2	69	61	8
F002	2	69	61	9
F003	2	69	60	9
F004	2	71	60	12
F005	2	72	60	12
F006	2	72	60	12
F007	2	72	60	12
F008	2	68	57	11
F009	2	65	55	9
F010	2	69	59	10
F011	2	69	60	9
F012	2	69	60	9
F013	2	70	60	9
F014	2	65	61	4
F015	2	64	60	3
F016	2	62	60	2
F017	1	62	60	2
F018	2	65	56	9
F019	4	63	55	8
F020	3	62	54	8

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
F021	7	60	54	6
F022	2	60	53	7
F023	2	58	52	6
F024	5	53	49	4
F025	5	47	46	1
F026	3	60	52	8
F027	3	56	50	6
F028	2	64	56	7
F029	2	63	56	7
F030	2	63	56	7
F031	2	63	63	0
F032	5	59	59	0
F033	8	48	48	0
F034	6	45	45	0
F035	8	45	44	0
F036	3	61	55	6
F037	3	60	54	6
F038	1	73	60	13
F039	2	73	61	12
F040	3	73	61	11
F041	2	73	62	11
F042	1	71	63	9
F043	1	67	61	6
F044	1	63	56	7
F045	2	63	56	6
F046	2	61	55	6
F047	3	66	59	7
F048	1	64	57	7
F049	3	60	55	5
F050	1	64	59	5
F051	2	59	56	4
F052	2	57	54	3
F053	2	56	53	4
F054	1	61	57	5
F055	4	57	53	4
F056	2	68	59	8

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
F057	2	68	60	9
F058	2	68	59	9
F059	2	69	59	9
F060	2	69	59	10
F061	2	69	59	10
F062	1	69	60	8
F063	1	61	56	5
F064	1	71	62	9
F065	1	59	55	4
F066	1	55	54	1
F067	1	57	54	3
F068	1	58	54	4
F069	1	61	55	6
F070	1	57	54	3
F071	1	56	53	2
F072	1	58	54	4
F073	1	58	54	4
F074	1	58	54	5
F075	1	56	53	3
F076	1	56	53	3
F077	1	57	53	4
F078	1	57	53	3
F079	1	57	53	3
F080	1	74	62	12
F081	1	71	61	11
F082	1	71	61	10
F083	1	72	61	11
F084	1	74	62	12
F085	1	72	61	11
F086	1	69	61	8
F087	1	70	62	8
F088	1	66	60	6
F089	1	67	61	6
F090	1	68	62	6
F091	1	69	63	7
F092	1	67	62	5

Receptor Number	No. of Dwelling Units	Modeled Noise Levels (Build 2036)	Build With Barrier Noise Level	Insertion Loss (IL)*
F093	1	65	60	5
F094	1	62	58	4
F095	1	63	59	4
F096	1	64	60	4
F097	1	66	62	4
F098	1	63	60	3
F099	1	62	58	3
F100	1	63	59	4
F101	1	61	58	3
F102	1	62	59	3
F103	1	60	58	2
F104	1	62	60	2
F105	1	60	57	3
F106	1	60	58	3
F107	1	60	57	3
F108	1	60	58	3
F109	1	59	57	2
F110	1	60	58	2
F111	1	59	58	2
F112	1	60	58	1
F113	1	60	59	1
F114	1	61	59	2
F115	1	62	60	2
F116	1	62	61	1
F117	1	64	61	3
F118	1	65	62	2
F119	1	64	63	1
Barrier 6 Summary				
C01	1	72	64	8
C02	1	66	64	2
C03	1	65	64	1
	Indicates noise impact			

Table 7: Noise Barrier Descriptions

Approximate Barrier Sta.	Easting (ft.)	Northing (ft.)	Bottom of Barrier Elevation (ft.)	Top of Barrier Elevation (ft.)	Barrier Height (ft.)
Barrier 2-1 Summary					
171+20	3,530,659.0	417,834.1	349.78	362.78	13.00
171+00	3,530,640.0	417,845.3	350.18	362.60	12.42
170+00	3,530,553.8	417,895.9	350.88	363.20	12.32
169+00	3,530,467.5	417,946.6	351.26	364.10	12.84
168+00	3,530,381.3	417,997.3	350.98	366.00	15.02
167+35	3,530,327.3	418,029.1	352.18	366.18	14.00
167+00	3,530,297.5	418,052.1	352.81	366.80	13.99
166+00	3,530,218.0	418,113.9	357.86	369.70	11.84
165+80	3,530,198.0	418,129.6	359.51	370.51	11.00
165+00	3,530,133.5	418,167.5	360.27	371.00	10.73
164+80	3,530,112.8	418,179.7	359.99	370.99	11.00
164+00	3,530,037.5	418,202.0	354.17	370.40	16.23
163+75	3,530,012.5	418,209.4	351.82	369.82	18.00
163+00	3,529,948.5	418,247.9	344.55	370.20	25.65
162+00	3,529,862.8	418,299.4	342.40	369.90	27.50
161+00	3,529,777.0	418,350.8	351.43	370.50	19.07
160+00	3,529,691.3	418,402.3	355.16	371.10	15.94
159+00	3,529,605.8	418,454.1	356.78	371.60	14.82
158+00	3,529,524.5	418,513.1	358.87	372.10	13.23
157+00	3,529,443.3	418,572.1	361.48	374.50	13.02
156+00	3,529,362.3	418,631.2	364.96	377.90	12.94
155+00	3,529,281.0	418,690.2	366.79	379.10	12.31
154+00	3,529,199.8	418,749.2	368.84	379.40	10.56
153+00	3,529,111.8	418,797.0	367.17	379.50	12.33
152+00	3,529,024.0	418,844.8	365.02	379.60	14.58
151+00	3,528,936.0	418,892.7	361.17	377.70	16.53
150+00	3,528,848.0	418,940.5	359.86	375.70	15.84
149+00	3,528,760.0	418,988.3	357.69	372.60	14.91
148+20	3,528,695.0	419,023.7	356.78	371.78	15.00
148+00	3,528,668.3	419,029.7	357.61	371.40	13.79
147+00	3,528,582.5	419,081.2	344.82	366.20	21.38
146+00	3,528,497.0	419,132.7	340.03	364.00	23.97
Barrier 2-2 Summary					
186+75	3,531,982.0	417,020.4	325.05	347.50	22.45
186+00	3,531,919.8	417,060.1	328.70	349.40	20.70

Approximate Barrier Sta.	Easting (ft.)	Northing (ft.)	Bottom of Barrier Elevation (ft.)	Top of Barrier Elevation (ft.)	Barrier Height (ft.)
185+00	3,531,835.3	417,113.7	331.45	351.20	19.75
184+00	3,531,750.8	417,167.3	338.06	353.10	15.04
183+00	3,531,665.3	417,221.8	337.99	355.00	17.01
182+60	3,531,627.8	417,245.5	338.58	355.58	17.00
182+00	3,531,584.8	417,281.8	340.99	356.80	15.81
181+00	3,531,506.8	417,346.3	349.24	359.70	10.46
180+00	3,531,421.3	417,398.3	351.34	360.60	9.26
179+00	3,531,336.0	417,450.5	351.43	361.40	9.97
178+00	3,531,261.3	417,495.9	350.71	360.30	9.59
177+00	3,531,154.3	417,536.5	344.30	360.20	15.90
176+35	3,531,090.5	417,560.7	341.11	359.11	18.00
176+00	3,531,062.5	417,577.8	342.57	359.00	16.43
175+15	3,530,991.0	417,621.2	343.15	360.15	17.00
175+00	3,530,975.3	417,626.6	341.23	359.90	18.67
174+80	3,530,951.3	417,634.7	340.38	360.38	20.00
174+00	3,530,886.8	417,673.7	340.09	360.80	20.71
173+00	3,530,801.0	417,725.2	342.91	361.60	18.69
172+00	3,530,715.3	417,776.7	345.56	362.50	16.94
171+00	3,530,629.8	417,828.2	346.24	362.60	16.36
170+45	3,530,580.0	417,858.0	346.73	363.20	16.47
Barrier 2-3 Summary					
199+75	3,533,074.5	416,311.2	320.98	335.88	14.90
199+00	3,533,011.8	416,352.3	319.68	335.88	16.20
198+00	3,532,927.0	416,407.8	318.32	337.00	18.68
197+00	3,532,843.5	416,462.7	319.18	337.80	18.62
196+00	3,532,759.8	416,517.5	322.79	339.70	16.91
195+60	3,532,722.8	416,541.8	325.65	340.65	15.00
195+40	3,532,709.8	416,558.2	327.02	340.77	13.75
195+00	3,532,682.3	416,582.1	329.69	341.60	11.91
194+35	3,532,633.8	416,624.4	333.16	343.41	10.25
194+00	3,532,601.3	416,641.3	333.67	343.67	10.00
193+35	3,532,544.0	416,671.3	328.40	342.40	14.00
193+00	3,532,507.3	416,679.7	324.66	342.30	17.64
192+80	3,532,480.8	416,685.7	322.66	342.16	19.50
192+00	3,532,418.5	416,726.2	319.99	341.70	21.71
191+00	3,532,334.5	416,780.5	322.58	343.00	20.42
190+00	3,532,250.5	416,834.7	317.55	344.40	26.85
189+00	3,532,166.3	416,888.7	320.98	345.30	24.32
188+00	3,532,082.0	416,942.6	322.54	346.10	23.56

Approximate Barrier Sta.	Easting (ft.)	Northing (ft.)	Bottom of Barrier Elevation (ft.)	Top of Barrier Elevation (ft.)	Barrier Height (ft.)
187+00	3,531,997.8	416,996.3	324.94	347.00	22.06
186+25	3,531,935.5	417,035.8	327.07	348.00	20.93
Barrier 2-4 Summary					
205+30	3,533,546.8	416,011.1	326.29	336.27	9.98
205+00	3,533,518.3	416,030.5	327.22	336.22	9.00
204+25	3,533,458.0	416,071.7	326.31	336.22	9.91
204+00	3,533,430.0	416,078.3	323.60	335.22	11.62
203+65	3,533,395.3	416,086.5	319.03	335.44	16.41
203+00	3,533,339.8	416,122.9	313.65	335.66	22.01
202+00	3,533,256.0	416,177.8	316.25	335.88	19.63
201+00	3,533,172.5	416,232.6	321.82	335.88	14.06
200+00	3,533,088.8	416,287.4	321.30	335.88	14.58
199+25	3,533,027.8	416,327.5	320.58	335.88	15.30
Barrier 3 Summary					
218+00	3,534,622.3	415,352.5	338.35	346.9	8.55
217+00	3,534,535.0	415,401.4	328.27	345.4	17.13
216+00	3,534,463.3	415,477.3	322.84	344.4	21.56
215+00	3,534,379.5	415,532.3	321.91	343.4	21.49
214+00	3,534,292.3	415,581.2	322.43	342.1	19.67
213+00	3,534,205.5	415,630.6	320.77	341.3	20.53
212+00	3,534,121.5	415,677.5	311.73	340.4	28.67
211+00	3,534,036.0	415,729.3	312.87	339.1	26.23
210+00	3,533,950.8	415,781.4	313.16	337.1	23.94
209+00	3,533,865.8	415,834.4	321.1	335.2	14.1
208+00	3,533,780.8	415,886.9	318.96	334.1	15.14
207+00	3,533,693.8	415,937.1	320.9	333.4	12.5
Barrier 4 Summary					
337+00	3,527,607.8	419,362.6	367.7	375.7	8.00
336+00	3,527,522.5	419,413.6	361.35	375.7	14.35
335+00	3,527,436.3	419,464.4	360.71	375.7	14.99
334+00	3,527,350.5	419,515.7	361.57	375.7	14.13
333+35	3,527,291.0	419,550.9	361.06	375.7	14.64
333+00	3,527,265.3	419,568.0	360.15	375.7	15.55
332+00	3,527,181.5	419,622.8	357.52	373.0	15.48
331+35	3,527,123.3	419,659.5	355.32	372.0	16.68
331+00	3,527,098.0	419,678.1	353.62	371.0	17.38
330+00	3,527,017.0	419,737.5	350.28	368.0	17.72
329+50	3,526,976.5	419,767.2	348.09	366.0	17.91
329+00	3,526,933.8	419,792.9	346.78	366.0	19.22

Approximate Barrier Sta.	Easting (ft.)	Northing (ft.)	Bottom of Barrier Elevation (ft.)	Top of Barrier Elevation (ft.)	Barrier Height (ft.)
Barrier 5 Summary					
389+00	3,532,057.5	416,674.6	317.50	341.30	23.80
388+00	3,531,973.3	416,728.5	321.69	345.30	23.61
387+00	3,531,889.0	416,782.2	326.11	348.20	22.09
386+00	3,531,804.5	416,835.8	328.96	350.20	21.24
385+00	3,531,721.5	416,888.3	335.71	351.10	15.39
384+35	3,531,655.8	416,920.2	340.08	352.58	12.50
384+00	3,531,632.8	416,934.6	339.73	353.10	13.37
383+00	3,531,547.8	416,987.3	336.90	355.10	18.20
382+00	3,531,462.8	417,040.1	344.28	358.00	13.72
381+00	3,531,377.8	417,092.9	344.37	360.00	15.63
380+00	3,531,293.0	417,145.8	345.80	362.90	17.10
379+00	3,531,201.0	417,186.9	353.14	364.90	11.76
378+50	3,531,151.5	417,209.1	355.78	366.78	11.00
378+00	3,531,112.5	417,233.8	356.22	367.90	11.68
377+40	3,531,056.0	417,269.7	355.12	368.12	13.00
377+00	3,531,027.5	417,286.3	354.56	367.80	13.24
376+35	3,530,968.5	417,320.7	354.74	366.74	12.00
376+00	3,530,941.8	417,337.9	356.44	366.80	10.36
375+00	3,530,858.3	417,393.0	355.31	366.70	11.39
374+35	3,530,801.8	417,433.5	350.51	364.70	14.19
373+80	3,530,766.5	417,484.5	344.92	363.92	19.00
373+00	3,530,702.8	417,522.8	345.72	364.60	18.88
372+65	3,530,670.0	417,542.4	346.35	365.45	19.10
372+35	3,530,643.8	417,549.7	346.98	365.73	18.75
372+00	3,530,610.3	417,563.0	348.29	366.60	18.31
371+00	3,530,524.3	417,613.9	353.71	371.60	17.89
370+60	3,530,481.5	417,639.2	356.34	372.34	16.00
370+00	3,530,426.0	417,662.4	360.53	374.50	13.97
369+00	3,530,349.5	417,711.2	357.45	374.50	17.05
368+65	3,530,316.8	417,732.1	357.44	374.44	17.00
368+00	3,530,261.0	417,758.3	360.67	375.40	14.73
367+00	3,530,170.5	417,801.8	367.70	378.40	10.70
366+35	3,530,111.8	417,836.5	366.95	377.95	11.00
366+00	3,530,087.0	417,856.8	366.28	377.30	11.02
365+00	3,530,008.8	417,920.7	359.52	372.75	13.23
364+00	3,529,922.5	417,971.6	347.83	369.55	21.72
363+00	3,529,836.5	418,022.5	342.19	369.30	27.11
362+00	3,529,750.5	418,073.5	345.86	369.90	24.04

Approximate Barrier Sta.	Easting (ft.)	Northing (ft.)	Bottom of Barrier Elevation (ft.)	Top of Barrier Elevation (ft.)	Barrier Height (ft.)
361+00	3,529,664.3	418,124.4	348.56	370.50	21.94
360+00	3,529,579.3	418,176.9	351.95	371.10	19.15
359+00	3,529,494.3	418,229.6	356.70	372.50	15.80
358+00	3,529,409.3	418,282.2	362.95	376.90	13.95
357+80	3,529,388.8	418,294.9	364.31	377.81	13.50
357+00	3,529,320.5	418,328.8	367.73	381.70	13.97
356+40	3,529,264.3	418,356.8	369.47	383.47	14.00
356+00	3,529,232.0	418,375.8	370.27	383.90	13.63
355+00	3,529,146.0	418,426.5	371.55	384.10	12.55
354+50	3,529,102.3	418,452.4	370.89	383.89	13.00
354+00	3,529,062.5	418,482.0	368.81	382.20	13.39
353+55	3,529,023.0	418,511.7	366.12	380.62	14.50
353+00	3,528,979.3	418,537.5	363.92	379.20	15.28
352+00	3,528,893.0	418,588.3	357.14	376.20	19.06
351+00	3,528,807.0	418,639.0	350.01	374.10	24.09
350+00	3,528,720.8	418,689.8	346.16	371.33	25.17
349+00	3,528,634.8	418,740.6	341.41	371.33	29.92
348+00	3,528,548.5	418,791.3	340.09	370.09	30.00
347+10	3,528,477.8	418,833.0	346.06	372.06	26.00
347+00	3,528,464.0	418,844.8	348.39	372.90	24.51
346+00	3,528,386.8	418,910.4	355.32	372.50	17.18
345+50	3,528,348.0	418,943.3	357.02	372.27	15.25
345+00	3,528,305.3	418,969.0	355.34	372.10	16.76
344+00	3,528,219.5	419,020.5	345.51	371.60	26.09
343+00	3,528,133.8	419,072.0	342.54	370.20	27.66
342+00	3,528,048.0	419,123.5	344.35	369.70	25.35
341+00	3,527,962.3	419,175.0	351.69	369.30	17.61
340+00	3,527,876.8	419,226.5	352.27	369.90	17.63
339+80	3,527,856.8	419,238.5	353.01	370.01	17.00
339+00	3,527,780.3	419,261.5	354.46	370.40	15.94
338+00	3,527,694.5	419,311.8	359.37	370.40	11.03

8. Construction Noise Considerations

Land uses that are sensitive to traffic noise, are also be sensitive to construction noise. A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, VDOT has developed and FHWA has approved a specification that establishes construction noise limits. This specification can be found in VDOT's 2007 *Road and Bridge Specifications,* Section 107.16(b.3), "Noise". The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

9. Public Involvement Process

9.1 Public Involvement Efforts

For noise barriers determined to be feasible and reasonable, the affected public will be given an opportunity to decide whether they are in favor of construction of the noise barrier. A final determination as to the construction of barriers will be made after the public hearing process. Before final decisions and approvals can be made to construct a noise barrier, a final design noise analysis will be performed. For barriers that are determined to be feasible and reasonable, input from the impacted property owners and renters must be obtained through citizen surveys. Of the votes tallied, 50% or more must be in favor of a proposed noise barrier in order for that barrier to be considered further. Upon completion of the citizen survey, the VDOT Noise Abatement staff will make recommendations to the Chief Engineer for approval. Approved barriers will be incorporated into the road project plans. A technical memorandum of the results of the public survey will be prepared and submitted to FHWA.

9.2 Information for Local Government Officials

FHWA and VDOT policies require that VDOT provides certain information to local officials within whose jurisdiction the highway project is located, to minimize future traffic noise impacts of Type I projects on currently undeveloped lands. (Type I projects involve highway improvements with noise analysis.) This information must include information on noise-compatible land-use planning, noise impact zones in undeveloped land in the highway project corridor. This section of the report provides that information, as well as information about VDOT's noise abatement program.

Noise-Compatible Land-Use Planning

Sections 12.1 and 12.2 of VDOT's 2011 Highway Traffic Noise Impact Analysis Guidance Manual outline VDOT's approach to communication with local officials, and provide information and resources on highway noise and noise-compatible land-use planning. VDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize the potential impacts of highway traffic noise.

Entering the Quiet Zone is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and

effective responses to it. A link to this brochure on FHWA's website is provided: http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/qz00.cfm

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

- Zoning,
- Other legal restrictions (subdivision control, building codes, health codes),
- Municipal ownership or control of the land,
- Financial incentives for compatible development, and
- Educational and advisory services.

The Audible Landscape: A Manual for Highway and Land Use is a very well-written and comprehensive guide addressing these noise-compatible land use planning strategies, with significant detailed information. This document is available through FHWA's Website, at http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/al00.cfm

Noise Impact Zones in Undeveloped Land along the Study Corridor

Also required under the revised 2011 FHWA and VDOT noise policies is information on the noise impact zones adjacent to project roadways in undeveloped lands. To determine these zones, noise levels are computed at various distances from the edge of the project roadways in each of the undeveloped areas of the project study area. Then, the distances from the edge of the roadway to the Noise Abatement Criteria sound levels are determined through interpolation. Distances vary in the project corridor due to changes in traffic volumes, or terrain features. These distances are given for this project in ***Table 8***. Any noise sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels. The graphics in ***Appendix A*** show the predicted 66 dB contours for the project.

Note – The 66 dB contour line is assumed to represent first floor noise levels. Due to this fact, future design year impacts will not always correlate to the receptor shown in the Appendix A graphics.

Table 8: Noise Impact Zones in Undeveloped Land for Local Government Officials

Section of Study Area	Distance from project roadway edge to Noise Abatement Criteria
	Build Condition
CNE A	Up to a maximum of 250 ft from edge of pavement
CNE B	Up to a maximum of 235 ft from edge of pavement
CNE C	Up to a maximum of 265 ft from edge of pavement
CNE D	Up to a maximum of 10 ft from edge of pavement
CNE E	Up to a maximum of 345 ft from edge of pavement
CNE F	Up to a maximum of 430 ft from edge of pavement
CNE G	Up to a maximum of 340 ft from edge of pavement
East of Catharpin Road – South of I-66	Up to a maximum of 400 ft from edge of pavement

VDOT's Noise Abatement Program

Information on VDOT's noise abatement program is available on VDOT's Website, at: http://www.virginiadot.org/projects/pr-noise-walls-about.asp . The site provides information on VDOT's noise program and policies, noise walls, and a downloadable noise wall brochure.

APPENDIX A

I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

Not Impacted, Not Benefitted

Proposed Roads

- Edge of Pavement
- Edge of Shoulder
- Stationing Marker
- Mainline Stationing

I-66 Widening Project
From SR 15 to SR 29

Prince William County and
the Town of Haymarket

Appendix A-1
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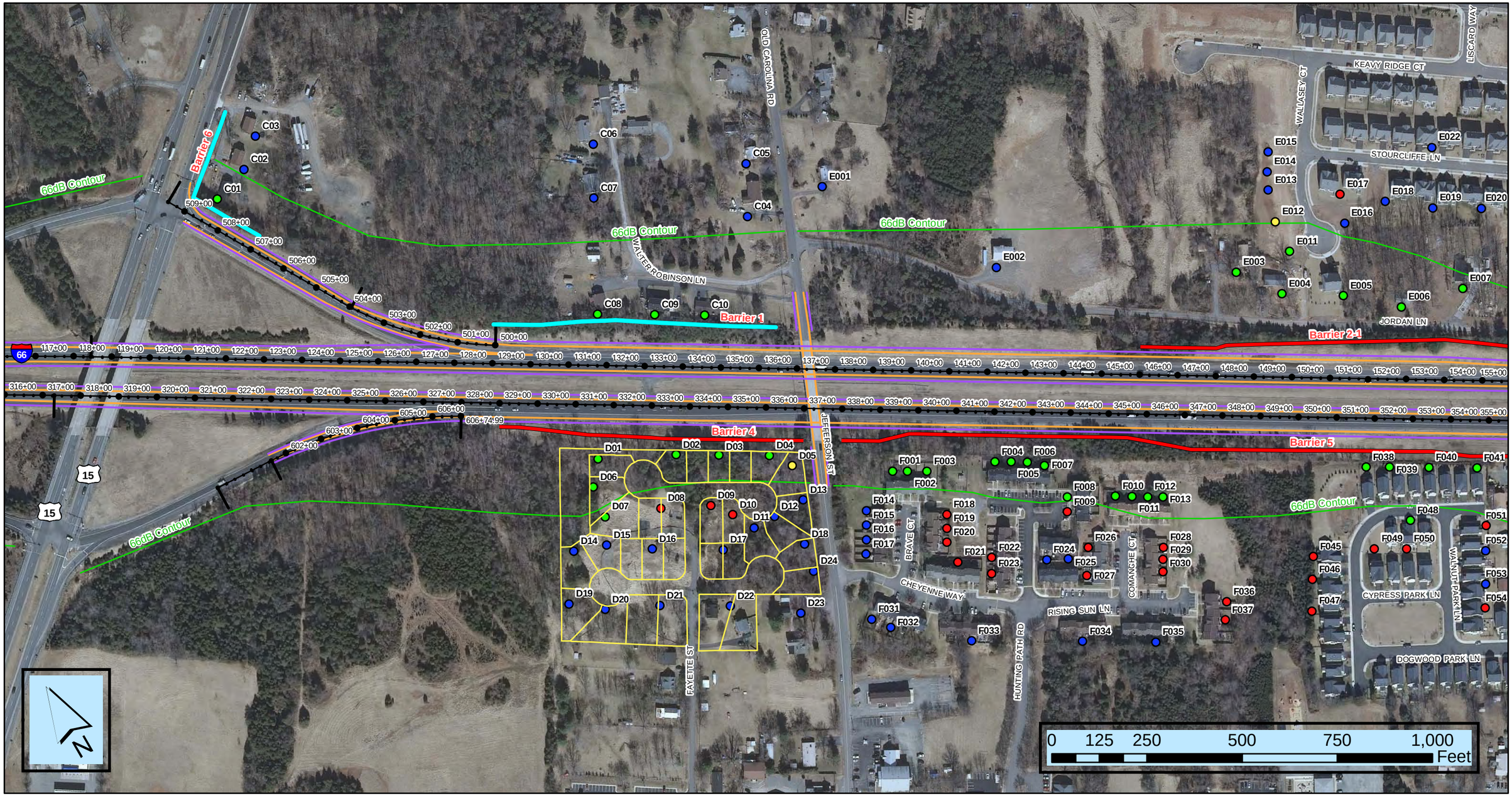

I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

- Evaluated Barrier - Feasible and Not Reasonable
- Potential Barrier - Feasible and Reasonable
- Impacted, Benefitted
- Impacted, Not Benefitted
- Not Impacted, Benefitted
- Not Impacted, Not Benefitted
- 66 dB Contour
- Planned Development

Proposed Roads

- Edge of Pavement
- Edge of Shoulder
- Stationing Marking
- Mainline Stationing

I-66 Widening Project
From SR 15 to SR 29

Prince William County and
the Town of Haymarket

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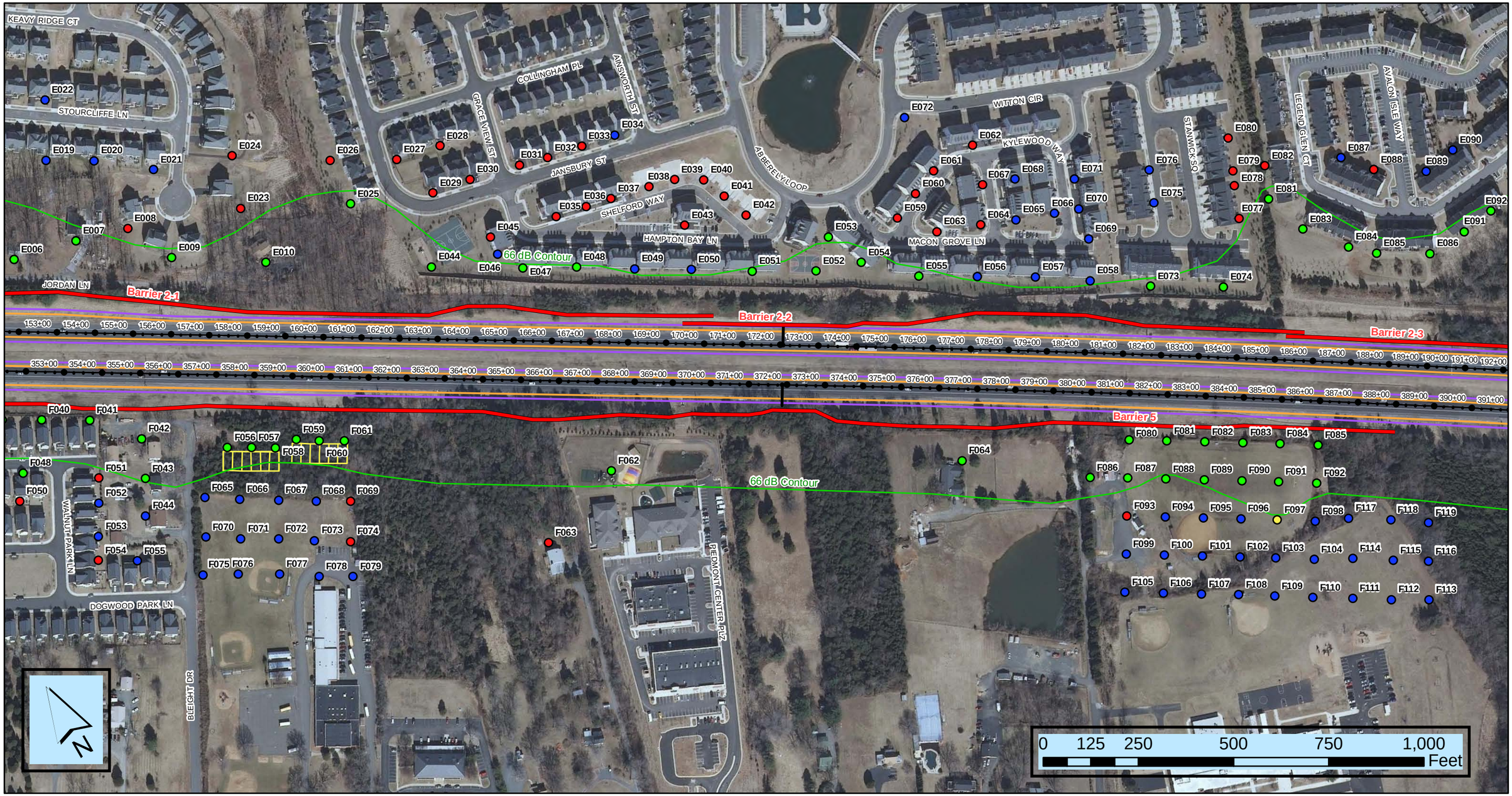


I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

- Evaluated Barrier - Feasible and Not Reasonable
- Potential Barrier - Feasible and Reasonable
- Impacted, Benefitted
- Impacted, Not Benefitted
- Not Impacted, Benefitted
- Not Impacted, Not Benefitted
- 66 dB Contour
- Planned Development

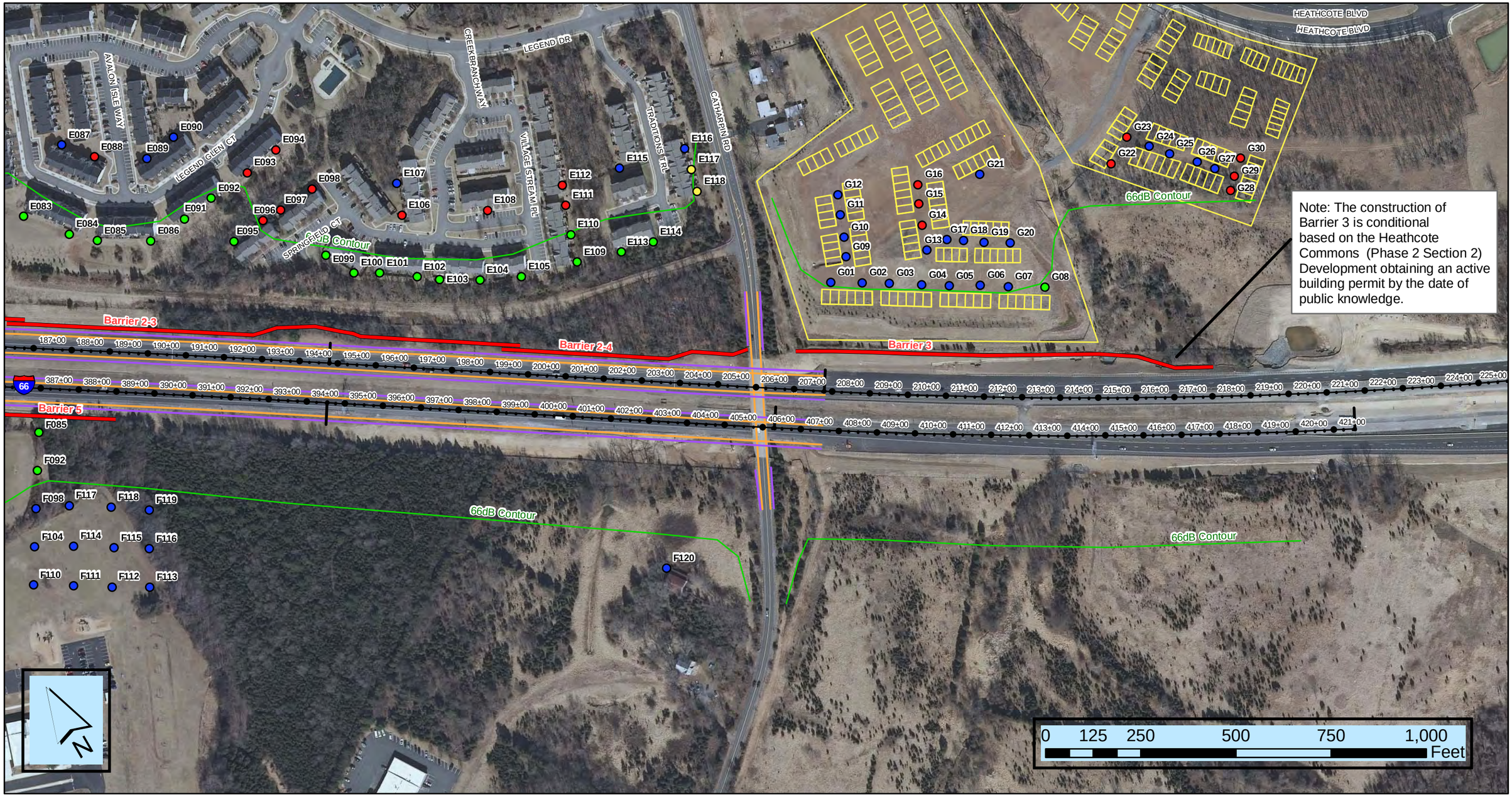
Proposed Roads

- Edge of Pavement
- Edge of Shoulder
- Stationing Marking
- Mainline Stationing

I-66 Widening Project
From SR 15 to SR 29

Prince William County and
the Town of Haymarket

Appendix A-1
Page 3



Note: The construction of Barrier 3 is conditional based on the Heathcote Commons (Phase 2 Section 2) Development obtaining an active building permit by the date of public knowledge.

I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

- Evaluated Barrier - Feasible and Not Reasonable
- Potential Barrier - Feasible and Reasonable
- Impacted, Benefitted
- Impacted, Not Benefitted
- Not Impacted, Benefitted
- Not Impacted, Not Benefitted
- 66 dB Contour
- Planned Development

Proposed Roads

- Edge of Pavement
- Edge of Shoulder
- Stationing Marking
- Mainline Stationing

I-66 Widening Project
From SR 15 to SR 29

Prince William County and the Town of Haymarket

APPENDIX B

State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Site # M1 **Description:** Along Antioch Access Road
Meter #
Done by Josh / LJ

Monitoring Data:

Date	02/15/12
Start Time	10:05 AM
End time	10:15 AM
Duration	10
Peak/OffPeak	off
Leq.	**61.1**

Calibration Data:

Begin Check	
End Check	

Atmospheric Data

Wind Speed	calm
Temp	58
Humidity	
Weather Conditions	sunny

Traffic Counts:

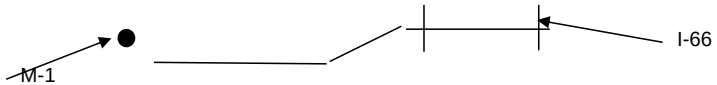
66

Roadway	NB	SB	EB	WB		
Cars			121	78		
MT			4	5		
HT			16	16		
Speed						

Site Data: **Pavement Type:**

Plan View:

Profile View:



Monitoring Notes:

Time	**Comment**

State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Site # M2 **Description:** Blieght Dr. - Alexandra's Keep
Meter #
Done by Josh / LJ

Monitoring Data:

Date	02/15/12
Start Time	1:45 PM
End time	1:55 PM
Duration	10
Peak/OffPeak	off
Leq.	**68.7**

Calibration Data:

Begin Check	
End Check	

Atmospheric Data

Wind Speed	calm
Temp	60
Humidity	
Weather Conditions	sunny

Traffic Counts:

66

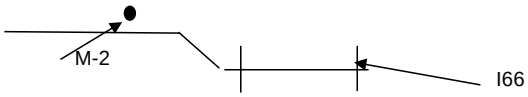
Roadway	NB	SB	EB	WB		
Cars			193	130		
MT			2	6		
HT			22	22		
Speed						

Site Data:

Pavement Type:

Plan View:

Profile View:



Monitoring Notes:

Time	Comment

Virginia Department of Transportation

State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Site # M3 **Description:** Stourcliffe Dr.
Meter #
Done by Josh / LJ

Monitoring Data:

Date	02/15/12
Start Time	1:45 PM
End time	1:55 PM
Duration	10
Peak/OffPeak	off
Leq.	**55.3**

Calibration Data:

Begin Check	
End Check	

Atmospheric Data

Wind Speed	calm
Temp	60
Humidity	
Weather Conditions	sunny

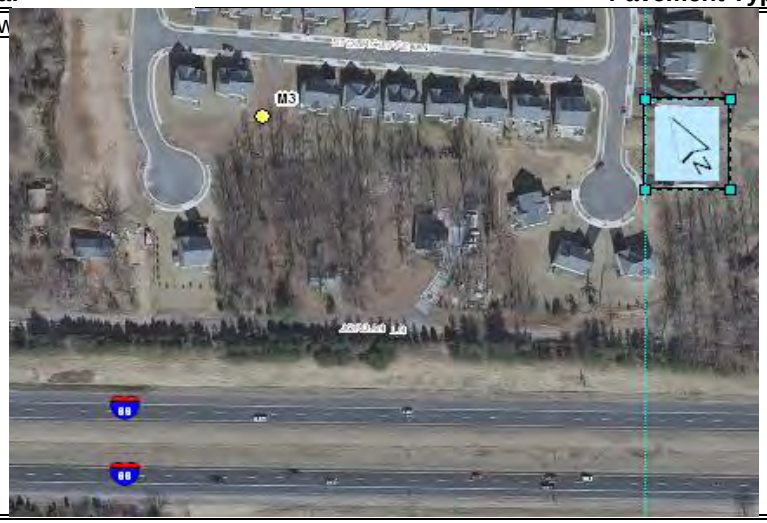
Traffic Counts:

66

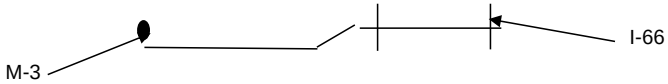
Roadway	NB	SB	EB	WB		
Cars			170	211		
MT			7	4		
HT			12	25		
Speed						

Site Data: **Pavement Type:**

Plan View



Profile View:



Monitoring Notes:

Time	Comment

Virginia Department of Transportation

State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Site # M4 **Description:** Basketball Court / Playground
Meter #
Done by Josh / LJ

Monitoring Data:

Date	02/15/12
Start Time	1:45 PM
End time	1:55 PM
Duration	10
Peak/OffPeak	off
Leq.	**56.3**

Calibration Data:

Begin Check	
End Check	

Atmospheric Data

Wind Speed	calm
Temp	60
Humidity	
Weather Conditions	sunny

Traffic Counts:

66

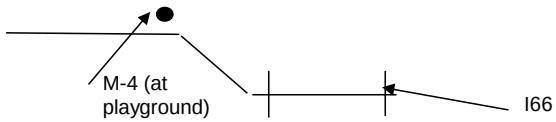
Roadway	NB	SB	EB	WB		
Cars			160	212		
MT			7	8		
HT			10	16		
Speed						

Site Data:

Pavement Type:

Plan View:

Profile View:



Monitoring Notes:

Time	Comment

APPENDIX C

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

Gregory A. Whirley
Acting Commissioner

August 1, 2011

MEMORANDUM

TO: Amir Salahshoor, Project Manager
Martin Mitchell, Environmental Contact

FROM: Paul M. Kohler

SUBJECT: UPC 93577

The 2009 General Assembly passed Chapter 120 (HB 2577), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2577 States: Requires that whenever the CTB or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, consideration *should* be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Landscaping in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2577 we are asking for your input (per Chapter VI of Materials Division's Manual of Instruction and Section 2B-3 Determination of Roadway Design of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are seeking your professional opinion by providing comments for the project noted above. Please distribute this memorandum to the appropriate District staff and combine all responses into one response.

Should you have any questions, please contact me at (804) 371-6766. Thank you for your time and consideration regarding this request.

Comment: Is noise reducing design feasible in lieu of construction of noise walls or sound barriers? For example, the roadway alignment can be shifted away from noise sensitive receptors or the roadway can be placed in deep cut (Location & Design to address)

Response: No, there are noise sensitive receptors present on the north and south sides of the interstate highway; shifting the road alignment would not be practicable. The I-66 widening project from a 4-lane to an 8-lane roadway will be accomplished within the existing 330-ft wide right-of-way. The median provides ample clear zone, vehicle recovery area and very safe separation between eastbound and westbound traffic on interstate I-66 with a design speed of 70 MPH. The scope of this project is for widening only, placing the road in a deep cut is not feasible.

Comment: Can the project support the use of low noise pavement in lieu of construction of noise walls or sound barriers? (Materials Division to address)

Response: The Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration.

Comment: Can landscaping be utilized to act as a visual screen if visual screening is required? (Location & Design to address)

Response: Possibly, while visual screening is not required on this project, approximately 3% of the construction budget may be programmed for landscaping and aesthetic treatments if necessary.

Note: Please provide the name of each responder Items 1 &3

APPENDIX D

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier 1
Community Name and/or CNE#	CNE C
Noise Abatement Category(s)	Category B
Design phase:	Final design

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	3
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	6,684 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d.	Total number of benefited receptors.	3
e.	Surface Area per benefited receptor unit. (ft^2/BR)	2,228 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	877 ft
b.	Height range of the proposed noise barrier. (ft)	8-13
c.	Average height of the proposed noise barrier. (ft)	11 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$300,780
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier System 2
Community Name and/or CNE#	CNE E
Noise Abatement Category(s)	Category B
Design phase:	Final design

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	116
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	111
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	96%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	100,146 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	111
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	143
d.	Total number of benefited receptors.	254
e.	Surface Area per benefited receptor unit. (ft^2/BR)	394 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	6,136 ft
b.	Height range of the proposed noise barrier. (ft)	9-27
c.	Average height of the proposed noise barrier. (ft)	16 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$4,506,570
f.	Barrier Material	
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	NA
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier 3
Community Name and/or CNE#	CNE G
Noise Abatement Category(s)	Category B
Design phase:	Final design

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	3
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	NA
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	NA

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	22,077 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	27
d.	Total number of benefited receptors.	30
e.	Surface Area per benefited receptor unit. (ft^2/BR)	736 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	1,503 ft
b.	Height range of the proposed noise barrier. (ft)	9-29
c.	Average height of the proposed noise barrier. (ft)	17 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$993,465
f.	Barrier Material	
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier 4
Community Name and/or CNE#	CNE D
Noise Abatement Category(s)	Category B
Design phase:	Final design

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	3-Aug-2011
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	9
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	8
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	89%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	12,272 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	8
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	4
d.	Total number of benefited receptors.	12
e.	Surface Area per benefited receptor unit. (ft^2/BR)	1,023 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	800 ft
b.	Height range of the proposed noise barrier. (ft)	8-19
c.	Average height of the proposed noise barrier. (ft)	13 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$552,240
f.	Barrier Material	
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier 5
Community Name and/or CNE#	CNE F
Noise Abatement Category(s)	Category B
Design phase:	

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	65
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	64
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	98%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	92,051 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	64
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	55
d.	Total number of benefited receptors.	119
e.	Surface Area per benefited receptor unit. (ft^2/BR)	774 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	5,116 ft
b.	Height range of the proposed noise barrier. (ft)	10-30
c.	Average height of the proposed noise barrier. (ft)	17 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$4,142,295
f.	Barrier Material	
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	12-Mar-12
Project No. and UPC:	Project: 0066-076-003 UPC: 93577
County:	Prince William
District:	NOVA
Barrier System ID:	Barrier 6
Community Name and/or CNE#	CNE C
Noise Abatement Category(s)	Category B
Design phase:	Final design

	Warranted	
1	Community Documentation (if applicable)	
a.	Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued).	
b.	Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI):	
c.	Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate."	
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	Yes

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	1
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	1
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	NA
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	NA
4	Will placement of the noise barrier conflict with existing utility locations?	NA

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	5,286 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	1
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d.	Total number of benefited receptors.	1
e.	Surface Area per benefited receptor unit. (ft^2/BR)	5,286 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
g.	Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes
2	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	441 ft
b.	Height range of the proposed noise barrier. (ft)	12
c.	Average height of the proposed noise barrier. (ft)	12 ft
d.	Cost per square foot. ($/$ft^2$)	$45/SF
e.	Total Barrier Cost ($)	$237,870
f.	Barrier Material	
3	**Community Desires Related to the Barrier**	
	Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to “decision” block and answer “no” to reasonableness question. As the reason for this decision, state that “The majority of the impacted receptor unit owners do not desire the barrier.”	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	No

Additional Reasons for Decision:

FINAL ABATEMENT DESIGN ADDENDUM REPORT

BARRIER SURVEY SUMMARY

I-66 WIDENING, ROUTE 29 TO ROUTE 15

Prince William County

PROJECT: 0066-076-003, B674, B675, C501, P101, R201

UPC: 93577
From: 1.2 Miles West of Route 15
To: 0.2 Miles West of Route 29

Prepared by:

Joshua D. Kozlowski
Environmental Division
Virginia Department of Transportation

May 2012

This addendum report documents the results of the barrier surveys conducted as part of the Final Design Noise Abatement Study for the I-66 Widening Project (UPC 93577,) in Haymarket and Gainesville, Virginia. The sections below should replace the corresponding sections of the Final Noise Abatement Study for the project mentioned above. Additional figures showing the survey results are attached and labeled as ***Appendix E***.

9.0 Public Involvement Process

This section documents the administration and results of the public preference surveys conducted for the recommended noise barriers. The figures show the results of the barrier survey by parcel. In some cases parcel boundaries were modified to show the actual benefitted area. For example, the athletic fields that are owned by the Prince William County School Board have been highlighted, instead of all the land that the school board owns. This is to make the figures easier to read and eliminate confusion.

9.1 Public Preference Surveys

Property owners and residents, including tenants, of all properties that would be benefited by the recommended noise barrier were sent survey letters by certified mail. The letters and surveys, from the VDOT Noise Abatement Section on VDOT letterhead, asked the respondents to indicate whether they wished to have the proposed noise barriers constructed or not. In these mailings, barrier details, contact information, a survey form and return envelope were provided to provide homeowners and residents with an understanding of the proposal and its implications, an opportunity to ask questions, and a formal survey form for expressing their views. Survey recipients were told that to register a vote against the barrier, a "no" survey form would have to be returned. In addition, a non response assumed that they were in favor of the barrier's construction. The letters and surveys were sent out during the week of March 21th, 2012. For this project, 388 certified letters were mailed. The disposition of all certified letters was tracked.

9.2 Survey Responses

Table 7 provides a summary of the survey responses. The table indicates the number of letters sent and the number of survey forms sent back with responses in favor ("YES"). VDOT policy is to treat survey letters that are not responded as votes in favor of the barrier.

Table 7: Summary of Barrier Survey Letters and Responses

Barrier Number	Total Letters mailed	Response: In favor of barrier?		Non-responsive	RTS (Return to Sender) - Unclaimed Undeliverable or vacant	Effective "Yes" response	Percentage Effective Yes
		Yes	No				
Barrier System 2	282	93	0	101	78	204	100%
Barrier 3	4	1	0	3	0	4	100%
Barrier 4	1	1	0	0	0	1	100%
Barrier 5	101	37	5	41	18	78	94%

Barrier System 2

All returned surveys had a favorable response ("YES") for the construction of the barrier. There were zero responses that were not in favor ("NO") of the barrier. One-hundred one (101) surveys were non-responsive. Seventy-eight (78) were unclaimed, undeliverable or vacant, therefore were not considered. This brings the effective "YES" responses to 204 as indicated in ***Table 7***. A breakdown of the return to sender letters is listed below:

Quantity	Comment
78	Letters returned to sender (RTS)
47	Unclaimed
13	Attempted Not Known
4	No Such Number
3	Not Deliverable as Addressed
3	Vacant
1	Refused
1	Forwarding Time Expired
1	No Mail Receptacle
5	Unknown

Since the percentage of effective "YES" votes for Barrier System 2 is 100% (>50%), Barrier System 2 will be carried forward for construction.

Additional public comments regarding Barrier System 2 are listed below:

Quantity	Comment
10	Concerned about current noise levels and fully supports barrier
7	Fully supports barrier
4	Thank you for sending survey
2	Feels that barrier should extend farther down to Old Carolina Road
2	Would be an enhancement to the community and improve quality of life
2	Would like to see trees and retained on residential side
2	Cannot sleep due to I-66 noise
1	Cannot sleep with windows open
1	Wonders if wall heights were maximized
1	Considered moving because of traffic noise
1	Where is the ROW with respect to my home?
1	Will I be able to see barrier out of my window?
1	In favor of barrier only if there is no cost to the homeowner
1	Worried that the widening project will make them sell their house to the state
1	Wants the best materials used to block noise and vibrations of larger vehicles
1	Concerned with the number of letters sent regarding this project (waste of money)
1	Wanted the ability to complete barrier survey online
1	Wanted to know if their HOA was notified?
1	Wanted meeting to discuss (vote) barrier aesthetics
1	Wanted meeting for sound / noise presentation

Quantity	Comment
1	Wanted to know if the barriers will be constructed before the road widening of I-66
1	Wants us (VDOT) to consider abatement of interior noise levels (3rd and 4th floor noise)
1	Wants wall to be placed nearest to the road as possible
1	I-66 traffic noise is heard inside my condo
1	Wants barrier to be constructed ASAP
1	When will construction begin?
1	Feels that VDOT should re-evaluate noise policy to consider "Type II" projects
1	Wants additional trees and shrubs planted on residential side of barrier
1	Hopes the barrier blocks the field lights at the school on the opposite side of interstate
1	Will this (barrier) impact our property during construction?
1	Wants barrier to be high enough to block traffic noise for 3-story homes
1	Resident took own DNL sound levels in excess of 65 dB's with personal sound level meter, believes an EIS will show the need for a barrier

Barrier 3

This barrier was conditional on Heathcote Commons (Phase 2, Section 2) Development receiving an active building permit before the date of public knowledge. As of April 23, 2012, this development has an active building permit. The date of public knowledge is May 2, 2012. Since the date of the development precludes the date of public knowledge, this barrier will be considered for construction.

Two returned surveys had a favorable response ("YES") for the construction of the barrier. There were zero responses that were not in favor ("NO") of the barrier. Two (2) surveys were non-responsive. None were returned to sender as unclaimed, undeliverable or vacant. This brings the effective "YES" responses to 4 as indicated in ***Table 7***. One of the ("YES") votes represent 27 residences with an active building permit (Heathcote Commons – Phase 1 and Phase 2).

Since the percentage of effective "YES" votes for Barrier 3 is 100% (>50%), Barrier 3 will be carried forward for construction.

Barrier 4

All returned surveys had a favorable response ("YES") for the construction of the barrier. There were zero responses that were not in favor ("NO") of the barrier. There were no un-responsive surveys. None were returned to sender as unclaimed, undeliverable or vacant. This brings the effective "YES" responses to 1 as indicated in ***Table 7***. There was only one vote for this barrier because the letter was sent to the developer of the Sherwood Forest subdivision that is currently under construction, which represents 12 residences.

Since the percentage of effective "YES" votes for Barrier 4 is 100% (>50%), Barrier 4 will be carried forward for construction.

Barrier 5

Thirty seven (37) returned surveys had a favorable response ("YES") for the construction of the barrier. There were five responses that were not in favor ("NO") of the barrier. Forty-one (41) surveys were

non-responsive. Eighteen (18) were unclaimed, undeliverable or vacant, therefore were not considered. This brings the effective "YES" responses to 78 as indicated in ***Table 7***. Partial mitigation was not evaluated for the "NO" votes due to the proximity of the adjacent residences that voted "YES" for the barrier. A breakdown of the return to sender letters is listed below:

Quantity	Comment
18	Letters returned to sender (RTS)
17	Unclaimed
1	Unknown

Since the percentage of effective "YES" votes for Barrier 5 is 94% (>50%), Barrier 5 will be carried forward for construction.

Additional public comments regarding Barrier 5 are listed below:

Quantity	Comment
6	Concerned about current noise levels and fully supports barrier
3	Fully supports barrier
2	Concern about barriers causing property tax increases
1	Will the barrier cost the homeowner any money?
1	Concerned that the widening will cause additional traffic backups at US 29 interchange
1	Wants barrier constructed before I-66 widening
1	Hopes barrier will be built soon
1	Would like to see trees and retained on residential side
1	Wants the residential side of barrier to look "nice"
1	Requests additional trees (in addition to the barrier) along the proposed route
1	Disclosure of noise levels for their property
1	Wants sound level measurements after construction
1	Concerned about barrier materials and maintenance
1	Questions about the varying barrier panel heights
1	Concern about view from second floor
1	Barrier placement questions
1	Barrier aesthetics questions (want to vote on)
1	Would be an enhancement to the community and improve quality of life
1*	Money would be better spent on fixing roads and traffic problems
1*	Bought home because of the view of the mountains
1*	Claims that I-66 noise does not bother them, not necessary to build
1*	Wanted the barrier only if barrier panels weren't almost 30' high. Referred to it as "tall and ugly"
1*	Claims that I-66 noise does not bother them, doesn't want to lose view of trees and occasional wildlife on opposite side of road
* Vote against the proposed noise barrier	

I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

Proposed Noise Barrier

BARRIER SURVEY RESULTS

- VOTED YES
- VOTED NO
- RECEIVED (GREEN CARD) - SURVEY NOT RET.
- UNCLAIMED / RETURNED / UNKNOWN

I-66 Widening Project
From SR 15 to SR 29

Prince William County and
the Town of Haymarket

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State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

VDOT **Virginia Department of Transportation**

Proposed Noise Barrier

BARRIER SURVEY RESULTS

- VOTED YES
- VOTED NO
- RECEIVED (GREEN CARD) - SURVEY NOT RET.
- UNCLAIMED / RETURNED / UNKNOWN

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Virginia Department of Transportation

Proposed Noise Barrier

BARRIER SURVEY RESULTS

- VOTED YES
- VOTED NO
- RECEIVED (GREEN CARD) - SURVEY NOT RET.
- UNCLAIMED / RETURNED / UNKNOWN

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From SR 15 to SR 29

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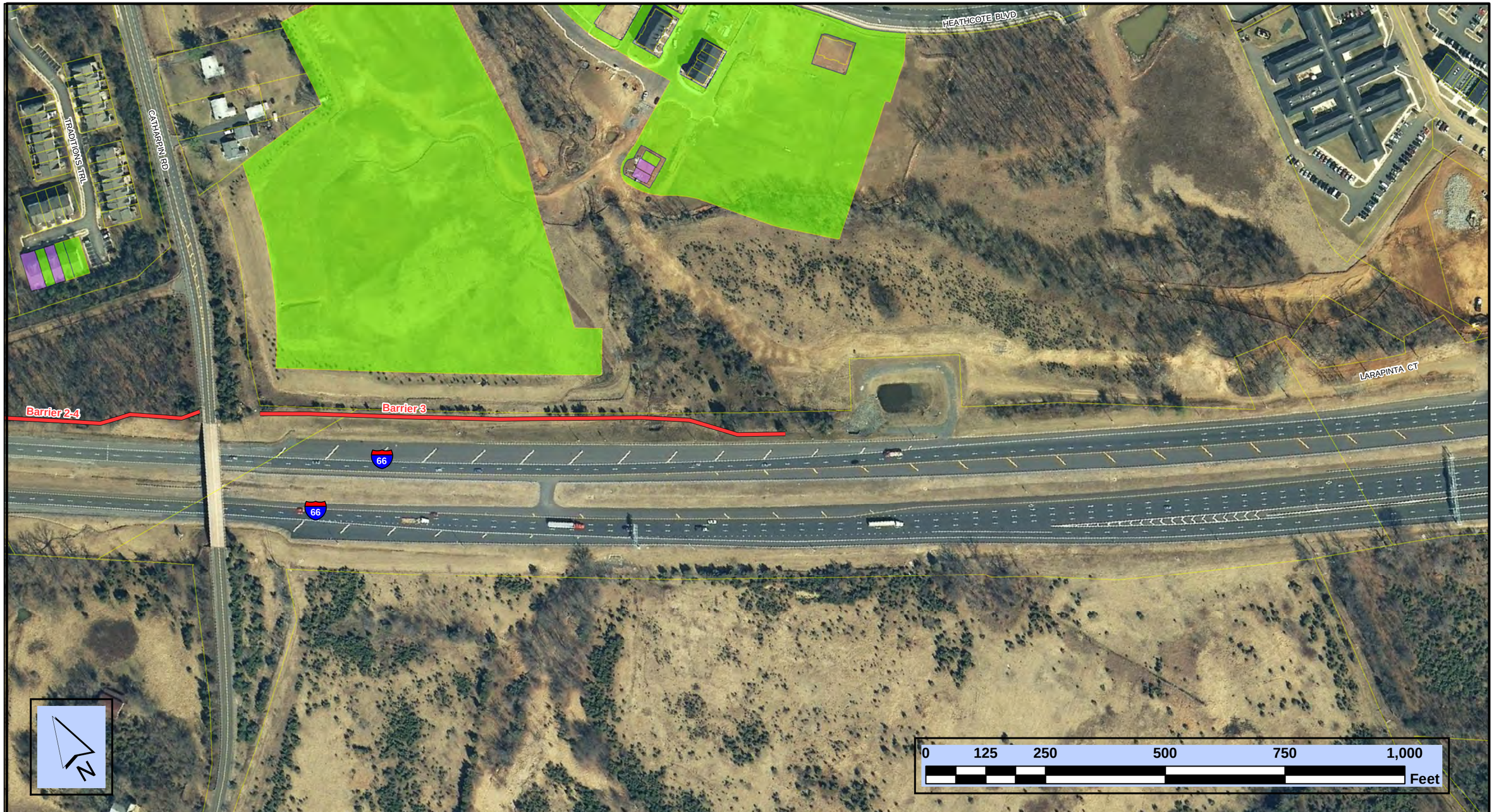

I-66 Widening Project
State Project: 0066-076-003, B674, B675, C501, P101, R201
UPC: 93577

Virginia Department of Transportation

Proposed Noise Barrier

BARRIER SURVEY RESULTS

- VOTED YES
- VOTED NO
- RECEIVED (GREEN CARD) - SURVEY NOT RET.
- UNCLAIMED / RETURNED / UNKNOWN

I-66 Widening Project
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