FINAL DESIGN
NOISE IMPACT ANALYSIS
TECHNICAL REPORT

PRINCE WILLIAM COUNTY LINE
BRIDGE OVER BULL RUN TO ROUTE 29 IN CENTREVILLE
A DESIGN-BUILD PROJECT

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FAIRFAX COUNTY, VIRGINIA

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1.0 EXECUTIVE SUMMARY

This report describes the details of a final design noise impact assessment completed for the Route 28 Widening project in Fairfax County, Virginia (**Figure 1**). The noise analysis was conducted in accordance with Federal Highway Administration (FHWA) and Virginia Department of Transportation (VDOT) noise assessment regulations and guidelines. The FHWA regulations are set forth in 23 Code of Federal Regulations (CFR) Part 772. VDOT's revised policy was updated most recently on February 20, 2018.

The Project is in Fairfax County, Virginia, and involves widening Route 28 (Centreville Road) from the existing four-lane divided roadway to provide a six-lane divided roadway from just north of the Bull Run bridge to Route 29. The limits of the Project are from approximately 100 feet north of the Prince William/ Fairfax County line (Route 28 Bull Run bridge) to approximately 0.3 miles south of Route 29, for a total length of approximately 2.3 miles. The design of the project will allow for the future expansion of the corridor to an eight-lane divided roadway in the future.

The study involved monitoring of existing noise conditions and modeling of existing (2016) conditions and future design year (2040) build condition in the study area with the FHWA-approved computerized Traffic Noise Model. Modeling accounted for the existing terrain and buildings and for existing and proposed roadways with projected loudest-hour traffic. A total of 689 receptors representing 689 noise-sensitive sites were modeled within 12 Common Noise Environments (CNEs) in the project study area. These 689 modeled sites include 642 residential dwellings units and 43 recreation receptor units representing five tennis courts, two sports fields, two basketball courts, five playgrounds, and one outdoor park area (some locations are represented by more than one receptor). There are also four interior receptor units representing one daycare, one church, one children's center, and one elementary school. The reduction in noise levels in the interior as a result of the building(s) was estimated to be 20 dBA (FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance," December 2011).

Table 1 provides a summary of existing and future noise levels and impacts for each CNE in the study area. Impacts are predicted to occur for existing conditions in CNEs C, D, E, H, I, J, and K. Existing noise impacts were predicted at 37 receptors including single-family residential dwelling units, one tennis court, and one playground in the study area. The worst-case noise hour existing noise levels ranged from 36 to 70 dBA. The future design year (2040) build condition resulted in noise impacts at ten CNEs (CNEs C, D, E, F, G, H, I, J, K, and L).

The widening results in an average 2 dBA increase in the acoustical environment over existing conditions. The future design year (2040) build noise levels are predicted to range from

38 to 72 dBA. Future noise impacts were predicted at 81 receptor locations (including 74 residences and 5 recreational sites) in the study area. Changes in the number of impacted areas from the noise analysis completed during preliminary design were a result of refined noise modeling detail, updated traffic data, refined proposed topography, and cut/fill detail.

TABLE 1
SUMMARY OF PREDICTED EXTERIOR NOISE LEVELS FOR THE WORST HOUR

CNE	LAND USE - DESCRIPTION	ACTIVITY CATEGORY	RANGE OF PREDICTED EXTERIOR NOISE LEVELS AND IMPACTS FOR THE WORST HOUR					
			EXISTING			2040 BUILD		
			SOUND LEVEL (dBA)		NUMBER OF IMPACTS	SOUND LEVEL (dBA)		NUMBER OF IMPACTS
			MIN	MAX		MIN	MAX	
A	Residences south of Old Centreville Road	B	54	64	0	56	65	0
	Basketball court south of Old Centreville Road	C	56	56	0	59	59	0
B	Row homes west of Route 28 and south of Upper-ridge Road	B	40	65	0	41	65	0
	Keepers Park and Sara Marie Terrace playgrounds	C	56	59	0	57	62	0
C	Residences east of Route 28 and south of New Braddock Road	B	47	57	0	50	58	0
	Willow Creek Academy playground, Hoskins Hollow outdoor use area	C	51	69	2	52	71	2
	Willowcreek Academy (Interior)	D	48	48	0	50	50	0
D	Residences east of Route 28 and south of New Braddock Road	B	47	70	18	49	72	19
	Heritage Forest tennis courts	C	58	59	0	61	62	0
E	Single-family residences west of Route 28 and south of New Braddock Road	B	36	70	4	38	72	9
	Centreville United Methodist Church playground and Montessori Children's Center Playground	C	57	63	0	59	64	0
	Centreville United Methodist Church and Montessori Children's Center	D	36	45	0	39	47	0
F	Residences east of Route 28, north of Green Trails Boulevard	B	55	57	0	57	58	0
	Sports fields and playgrounds for Centreville Elementary School	C	56	64	0	58	66	1
	Centreville Elementary School	D	43	43	0	46	46	0
G	Homes east of Route 28, south of Green Trails Boulevard	B	52	63	0	54	66	1
H	Compton Village Drive homes	B	42	58	0	44	61	0
	Compton Village tennis courts	C	49	66	1	53	71	2
I	Row homes off Old Centreville Road, north of Compton Road and west of Route 28	B	45	68	5	46	70	36
J	Compton Village, north of Compton Road and east of Route 28	B	48	69	6	50	71	9
K	Residences along Route 28 with driveway access, south of Compton Road and west of Route 28	B	55	68	1	57	68	1
L	Residences along Route 28 with driveway access, south of Compton Road and east of Route 28	B	52	64	0	55	66	1

Noise abatement must be considered where noise impact is predicted to occur with the 2040 Build Alternative. Noise abatement is evaluated to determine if it is warranted, feasible, and reasonable. **Table 2** summarizes the total length, estimated cost, and benefits that would be provided by the noise barriers that were evaluated in this study. Noise abatement was determined to be feasible and reasonable for CNEs (D, E, I, and J).

TABLE 2
SUMMARY OF NOISE BARRIERS EVALUATED IN THIS STUDY

CNE	BARRIER ID	NUMBER OF IMPACTED RECEPTORS	IMPACTED AND BENEFITTED RECEPTORS	NON-IMPACTED AND BENEFITTED RECEPTORS	NOISE BARRIER DETAILS				SURFACE AREA/ BENEFITTED RECEPTOR (SF/BR) [1]	FEASIBLE?	REASONABLE?
					LENGTH (FT)	AVERAGE HEIGHT RANGE (FT)	SURFACE AREA (SF)	COST AT $42/SF			
C	Barrier C1	2	2	2	400	18.0	7,193	$302,106	1,798	Yes	No
D	Barrier D1	18	18	17	976	23.7	23,095	$969,990	660	Yes	Yes
D	Barrier D2	1	1	0	274	15.0	4,107	$172,494	4,107	Yes	No
E	Barrier E1	6	6	7	1,056	18.4	19,469	$817,698	1,498	Yes	Yes
	Barrier E2	3	3	1	448	15.3	6,876	$288,792	1,719	Yes	No
F	Barrier F1	1	1	2	500	11.8	5,900	$247,800	1,967	Yes	No
G	Barrier G1	1	1	1	513	10.0	5,133	$215,586	2,567	Yes	No
H	Barrier H1	2	2	0	350	12.0	4,204	$176,568	2,102	Yes	No
I	Barrier System I1 and I2	36	34	26	1,227	17.0	20,852	$875,784	348	Yes	Yes
J	Barrier J1	9	9	3	708	17.74	12,558	$527,436	1,047	Yes	Yes
K	Barrier K1	1	1	0	183	18.0	3,290	$138,180	3,290	Yes	No
L	Barrier System L1 and L2	1	1	1	578	30.0	17,356	$728,952	8,678	Yes	No

1 Where Square Feet/Benefitted Receptor (SF/BR) exceeds VDOT's maximum of 1,600, a noise barrier would not be considered cost-reasonable.

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.

2.0 INTRODUCTION

2.1 BACKGROUND AND PURPOSE

A final design traffic noise analysis was performed for the Route 28 Widening project in Fairfax County, Virginia. All highway noise impact assessment procedures, noise abatement criteria, and documentation are in accordance with the FHWA and VDOT noise assessment regulations and guidelines. FHWA regulations for highway traffic noise for federal-aid highway projects are contained in Title 23 of the United States Code of Federal Regulations Part 772 (23 CFR 772), updated July 13, 2011. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 (updated February 20, 2018). The FHWA regulations for mitigation of highway traffic noise in the planning and design of federally aided highway projects contained in 23 CFR 772 state that a "Type I" traffic noise impact analysis is required when there is the addition of through-traffic lanes or ramps in an interchange.

This report documents a summary of the roadway improvements under study, a description of noise terminology, the applicable standards and criteria, the computations of existing and future noise levels, a projection of future noise levels, identification of potential noise impacts, evaluation of measures to mitigate noise impacts, a discussion of construction noise, and information to assist local officials.

2.2 PROJECT DESCRIPTION

The Project is located in Fairfax County, Virginia, and involves widening Route 28 (Centreville Road) from the existing four-lane divided roadway to provide a six-lane divided roadway from just north of the Bull Run bridge to Route 29. The limits of the Project are from approximately 100 feet north of the Prince William/ Fairfax County line (Route 28 Bull Run bridge) to approximately 0.3 miles south of Route 29, for a total length of approximately 2.3 miles. The design of the project will allow for the future expansion of the corridor to an eight-lane divided roadway in the future.

A "Preliminary Noise Analysis" was completed as part of the EA documentation, and multiple noise barriers were identified as potentially warranted, feasible, and reasonable at that time. This Final Design Noise Impact Analysis Technical Report is being completed consistent with the requirements of the final design details that have been developed.

3.0 METHODOLOGY

The Noise Control Act of 1972 gives the United States Environmental Protection Agency (U.S. EPA) the authority to establish noise regulations to control major noise sources, including motor vehicles and construction equipment. Furthermore, the U.S. EPA is required to set noise emission standards for motor vehicles used for interstate commerce and the FHWA is required to enforce the U.S. EPA 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 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 NEPA (1969). The current VDOT State Noise Abatement Policy became effective on July 13, 2011 (updated February 20, 2018).

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.

3.1 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 3** for various activities, represents 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 3**. The study area consists of exterior residential (Category B) land use, athletic/recreational fields (Category C), exterior commercial (Category E), the interior of public/institutional buildings (Category D), as well as other non-noise-sensitive land uses included in Category F and Category G (undeveloped).

TABLE 3
FHWA NOISE ABATEMENT CRITERIA
HOURLY A-WEIGHTED SOUND LEVEL DECIBELS ($Leq_{(h)}$ IN dBA)

ACTIVITY CATEGORY	ACTIVITY CRITERIA $Leq_{(h)}$	EVALUATION LOCATION	ACTIVITY DESCRIPTION
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B*	67	Exterior	Residential
C*	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, 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	--	--	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

3.2 DEFINITION OF NOISE IMPACT

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

- The predicted traffic noise levels (future design year) approach or exceed the NAC, as shown in **Table 3**.

  The VDOT State Noise Abatement Policy defines an approach level to be used when determining a traffic noise impact. The “Approach” level has been defined by VDOT as one dBA 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.

  A substantial noise increase has been defined by VDOT when the predicted (future design year) highway traffic noise levels exceed existing noise levels by 10 dBA or more for all noise-sensitive exterior activity categories. 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. Receptors that satisfy this condition warrant consideration of highway traffic noise abatement.

If a 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.

3.3 NOISE PREDICTION MODEL

Since roadway noise levels can be determined accurately through computer modeling techniques for areas that are dominated by road traffic, design year traffic noise calculations have been predicted using the FHWA'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 alignment (horizontal and vertical) are input into the model, along with the receptor locations, traffic volumes of cars, medium trucks (vehicles with two axles and six 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.

Future build TNM runs were developed by modifying the validated existing condition models to account for the proposed highway widening. Roadway design engineering files and future terrain contour files were supplied by Dewberry. The modeling accounted for the variability in the local terrain and included the following parameters that affect the propagation of traffic noise: terrain lines, ground zones, and fixed height barriers to represent buildings. The default ground type used in the modeling was “lawn.” The noise model also included a number of “empty” lanes (e.g., roadways without traffic) to represent paved shoulders and side streets.

To fully characterize future noise levels at all noise-sensitive land uses in the study area, noise prediction receivers (also called “receptors” and/or “sites”) were added to the measurement sites in the TNM runs. A link to the TNM runs is located in Appendix F.

3.4 TRAFFIC DATA

The traffic data used in the noise analysis must produce sound levels representative of the loudest hour of the day in the future design year, in accordance with FHWA and VDOT policy. Traffic data was supplied by WSP USA for the 2016 existing and 2040 design year for Route 28 and other major arterials that intersect (including Upperridge Drive, Old Centreville Road, Machen Road, New Braddock Road, Old Mill Road, Green Trails Boulevard, and Compton Road). A.M. and P.M. peak hour traffic volumes were developed for all roadways. Heavy vehicle percentages were developed for the various sections of Route 28. Since average running speeds were not developed, Skelly and Loy used the posted speeds for all roadways.

3.4.1 Worst-Case Noise Hour

The traffic data used in the noise analysis must produce sound levels representative of the loudest (“worst noise”) hour of the day in the future design year, in accordance with FHWA and VDOT policy. In many cases, experience has shown that the peak traffic hour may coincide with the worst noise hour of the day. However, on occasion, conditions such as capacity, effects of traffic on vehicle speed, higher than normal off-peak truck percentages, or unusual hourly traffic distribution may cause the worst noise hour of the day to be different from the peak traffic hour of the day. Due to peak-hour congestion on major commuter routes, the worst noise hour may occur during the off-peak period on such roadways.

Noise levels have been predicted for that hour of the day when the vehicle volume, operating speed, and number of trucks (vehicles with three 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 and at or near Level of Service (LOS) C conditions.

HMMH conducted the preliminary engineering noise analysis. It was decided that, due to the pandemic, any newly collected traffic data to be used in Environmental Traffic Data

(ENTRADA) would not accurately represent current normal traffic conditions. In addition, the AM/PM peak traffic data represents worst-case scenario. As a result, through coordination with VDOT, a decision was made to use the same traffic data as the preliminary noise analysis. HMMH determined the loudest hour by running all study area receivers in TNM with both the A.M. and P.M. peak hour traffic. In the Build case, the A.M. peak hour was louder for 642 receivers while the P.M. peak hour was louder for only 46 receivers. The existing case was less clear, with the A.M. peak louder for 454 receivers and the P.M. louder for 231 receivers (receivers with no difference are excluded). However, in the Existing case, on average, the A.M. peak hour was louder by 0.4 decibel. As a result of these comparisons, the A.M. peak hour was chosen to be modeled as the loudest hour for both the Existing and Build cases and for all roadways and sections of Route 28. Appendix B provides the loudest-hour traffic data for the roadways used in TNM for this project.

4.0 EXISTING NOISE ENVIRONMENT

4.1 STUDY AREA/COMMON NOISE ENVIRONMENT DESCRIPTION

The majority of noise-sensitive land uses in the project study area include rowhomes and single-family residences within an approximate 500-foot corridor adjacent to both the northbound and southbound lanes of Route 28. Following VDOT and FHWA policies and procedures, the receptors used in the model to represent exterior activity areas at noise-sensitive land uses were grouped into CNEs. If the property contains an elevated deck, the receptor location and elevation used in the assessment represents the elevated location.

A CNE is defined as a group of receptors within the same Activity Category that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. There are 12 distinct geographic areas within the project area containing noise-sensitive land uses within 500 feet of the construction limits that can be considered similar in acoustical environment. The CNEs within the project area (**Figure 2**) consist of exterior residential (Category B) land use, athletic/recreational fields (Category C), exterior commercial (Category E), interior of public/institutional buildings (Category D), as well as other non-noise-sensitive land uses included in Category F and Category G (undeveloped). The modeled receptors for the analysis were grouped into the following CNEs:

- CNE A is located east of Route 28 and South of Old Centreville Road with clusters of single-family row homes to the south. There is also one isolated residence near Route 28 and a basketball court. CNE A contains 29 modeling-*only* sites (A-001 to A-029), which represents 28 residences and the Little Rocky Run (LRR) Home Owners Association (HOA) Basketball Court. CNE A also contains one monitoring site (M1) which was used for model validation.

- CNE B is located west of Route 28 and south of Upperridge Road. It includes very dense single-family row homes with some small recreational playgrounds mixed in. CNE B contains 166 modeling-*only* sites (B-001 to B-166), which represents 164 residences and two playgrounds. CNE B also contains two monitoring sites (M2 and M3) which were used for model validation.

- CNE C is located east of Route 28 and on both sides of Old Centreville Road (Rt 898), north of New Braddock Road. Land use mostly consists of second-row single-family row homes south to New Braddock Road. There are commercial properties between the residences and Route 28. There is one first-row day care center (Willow Creek Academy) with playground equipment facing Route 28. CNE C contains 26 modeling-*only* sites (C-

001 to C-026) which represent 1 daycare, 1 playground, 1 outdoor land use area, and 19 residences.

- CNE D is located east of Route 28 and south of New Braddock Road. Land use includes dense single-family row homes near Route 28 with backyards and decks facing Route 28, accessed on Darkwood Drive and Federation Drive. Two tennis courts near New Braddock road are near a dog park. CNE D contains 99 modeling-*only* sites (D-002 to D-100) which represent 2 tennis courts and 95 residences

- CNE E is west of Route 28 and east of Old Centreville Road, south of New Braddock Road. There is a Methodist church with a playground near Route 28, a Montessori children's school with a playground near Route 28 and neighborhoods of spread-out single-family homes to the south, off of Wheat Mill Way to Old Mill Road. CNE E contains 70 modeling-*only* sites (E-001 to E-070) which represents 2 playgrounds, 1 church, 1 children's center, 1 tennis court, and 62 residences.

- CNE F is located to the east of Route 28 north of Green Trails Boulevard and includes Centreville Elementary school and two isolated houses off of La Petite Place. The school's baseball field is near Route 28, and a large playground with basketball courts is set back. CNE F contains 21 modeling-*only* sites (F-001 to F-021) which represents 2 residences, 1 school, 1 baseball field, 1 playground, and basketball courts.

- CNE G is located south of Green Trails Boulevard and east of Route 28. It includes an isolated pocket of single-family homes with yards facing Route 28. CNE G contains ten modeling-*only* sites (G-001 to G-010) which represents ten single-family residences.

- CNE H is east of Route 28 and off of Compton Village Drive. The land use is comprised of the Compton Village development of single-family row homes, a few tennis courts, and a pool. The tennis courts are closer to Route 28 than the homes or pool. CNE H contains 77 modeling-*only* sites (H-001 to H-077) which represents 3 tennis courts and 71 single-family residences.

- CNE I is west of Route 28, between Old Mill Road and Compton Road. A densely settled community of row homes is located off of Old Centreville Road, north of Compton Road, with many with backyards facing Route 28. CNE I contains 134 modeling-*only* sites (I-001 to I-134) which represents 134 residences.

- CNE J is located east of Route 28 and north of Compton Road. Land use includes row homes in the southern end of the Compton Village community off Pittman Court. A few homes have yards near Route 28. CNE J contains 34 modeling-*only* sites (J-001 to J-034) which represents 34 residences.

- CNE K is west of Route 28 south of Compton Road and includes several homes with driveway access along Route 28, south to Bull Run. The CNE also includes homes spread out along Ordway Road. CNE K contains 15 modeling-*only* sites (K-001 to K-015) which represents 15 single-family residences.

- CNE L is east of Route 28 between Compton Road and Bull Run. It contains a few widely spaced homes with driveway access to Route 28. CNE L contains seven modeling-*only* sites (L-001 to L-007) which represents seven single-family residences.

4.2 UNDEVELOPED LANDS AND PERMITTED DEVELOPMENTS

Highway traffic noise analyses are (and will be) performed for developed lands as well as undeveloped lands if they are considered "permitted." Undeveloped lands are deemed to be permitted when there is a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of at least one building permit.

In accordance with the *VDOT Traffic Noise Policy*, an undeveloped lot is considered to be planned, designed, and programmed if a building permit has been issued by the local authorities prior to the Date of Public Knowledge for the relevant project. VDOT considers the "Date of Public Knowledge" as the date that the final NEPA approval is made. FHWA approved the Categorical Exclusion, as revised, on October 30, 2019. VDOT has no obligation to provide noise mitigation for any undeveloped land that is permitted or constructed after this date.

According to a review of Fairfax County Planning Commission site plan and submission records, there are no new planned or permitted lands or developments (building permits) with noise-sensitive land use within a 500-foot buffer zone as of the NEPA approval date (October 30, 2019).

4.3 MONITORING OF EXISTING NOISE LEVELS

A noise monitoring program was conducted along the Route 28 Project corridor, consistent with FHWA and VDOT recommended procedures to document existing ambient noise levels in noise-sensitive locations in the study corridor and to provide a means for validation of the noise prediction model.

Noise monitoring was conducted at 10 short-term (30 minutes in duration) sites on December 8 and 9, 2016, for the preliminary engineering. The monitoring efforts from the preliminary engineering were determined to be sufficient to accurately validate the final engineering TNM models. Measurement sites were generally located in areas with the highest noise exposures, adjacent to first-row properties. Traffic classification counts on the roadways nearest each measurement site were conducted simultaneously with each noise measurement. The short-term measurements characterized existing noise levels in the study area but were not necessarily conducted during the loudest hour of the day. They included contributions from sources other than traffic, such as aircraft. Figure 2 shows the locations of the noise measurement sites within the project study area. The short-term noise monitoring locations are shown in the study area graphic and are numbered with the prefix “M.”

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.

Short-term noise measurements were conducted using an HMMH-owned Larson-Davis 824 (ANSI Type I, “Precision”) integrating sound level meter. HMMH’s noise measurement instruments were calibrated annually at a certification laboratory, with calibrations traceable to the National Institute of Standards and Technology. During the monitoring program, the sound level meters were calibrated in the field using a handheld acoustic calibrator at the beginning and end of each measurement period.

The short-term data collection procedure involved measurement of one-second equivalent sound levels (Leqs) over a period of 30 minutes. Continuous logging of events was conducted during the monitoring, so that intervals that included events not representative of the ambient noise environment or that were not traffic-related could be excluded later. For each 30-minute period, a “Total Leq” (including non-contaminated sound level contributions from every 1-second interval) and a “Traffic-Only Leq” (excluding those intervals that contained significant noise events unrelated to roadway noise) were determined. By comparing the two totals, the significance of non-traffic events (such as aircraft operations) to the overall noise level can be determined for the measurement period.

The measured noise levels appear in Table 4 as equivalent sound levels (Leq). As described above, the Leq is a sound-energy average of the fluctuating sound level (in A-weighted decibels, dBA) measured over a specified period of time. Table 4 provides the site address as well as the date, start time, and duration of each measurement. Measured noise levels are presented both in terms of the “Total Leq” and the “Traffic-only Leq.”

As shown in Table 4, the Total Leq ranged from a low of 59 dBA at 14086 Asher View (Site M3) and 14592 Castleford Court (M9) to a high of 71 dBA at 7102 Centreville Road (M10). Except for Site M3, values of the Traffic-Only Leq were the same or very similar to the measured Total Leqs at each measurement site, which is an indication that roadway traffic was the dominant source of noise despite of the presence of other sporadic and occasional noise events due to human-related activity.

Other sources of noise in the existing environment included but were not limited to aircraft overflights, wind in the trees, children playing, and other human-related activity. Appendix C provides details of the data acquired during the noise measurement program, including noise monitor output, site sketches, photographs, noise level data with site summary results, and traffic counts with hourly totals. The locations of the measurement sites are shown on the overview map in Figure 2.

TABLE 4
SHORT-TERM NOISE MONITORING SUMMARY

SITE ID	ADDRESS	DATE	TIME START	DURATION (MINUTES)	MONITORED TOTAL Leq (dBA)	MONITORED TRAFFIC-ONLY Leq (dBA)
M1	14034 Sawteeth Way	12/8/2016	10:44:00	30	63	63
M2	14065 Keepers Park	12/8/2016	11:44:00	30	65	65
M3	14086 Asher View	12/8/2016	12:48:00	30	59	56
M4	Centreville Road	12/8/2016	13:49:00	30	67	67
M5	Grainery Road	12/8/2016	15:10:00	30	61	60
M6	Darkwood Drive	12/9/2016	15:03:00	30	69	69
M7	Centreville Elementary School (baseball field)	12/9/2016	11:34:00	30	63	63
M8	Compton Village Drive	12/9/2016	8:46:00	30	61	61
M9	14592 Castleford Court	12/9/2016	9:44:00	30	59	59
M10	7102 Centreville Road	12/9/2016	13:50:00	30	71	71
* Source: HMMH, 2018						

The location of each noise monitoring site is indicated with a star symbol on **Figure 2**. Additional noise monitoring data (site sketches, meter printouts, and calibration certificates) are located in Appendix A. The monitored Leq in the study corridor ranged from 59 dBA to 71 dBA. Traffic noise from Route 28 was the dominant source of noise at each of the monitoring locations.

4.4 NOISE MODEL VALIDATION

The noise monitoring data are primarily used to validate the computer model used to predict existing and future levels. Upon measurement of the existing noise levels, a threedimensional noise model of the existing roadway network was constructed which incorporates all significant terrain features that define the propagation path between the roadway and noise-sensitive receptors. Traffic volumes, composition, and speeds that were observed during the short-term monitoring periods were used as inputs to generate the validation models sound levels. FHWA and VDOT consider a difference of ±3 dBA or less between the measured noise levels and the computer modeled noise levels is considered acceptable. This computer model validation verifies that the sound propagation paths within the model are accurate and that the modeling techniques are correct and ensures that reported changes between the 2016 existing conditions and future design year (2040) conditions are due to changes in traffic or propagation path and not discrepancies between monitoring and modeling techniques.

The model validation was performed for the existing traffic conditions observed and recorded during the measurement period. As these noise measurements were not necessarily obtained during the existing loudest hour, the existing noise levels obtained during the 30-minute short-term monitoring session were not predicted as the project's existing noise levels. Instead, the validated existing conditions TNM noise model was used to generate existing loudest-hour noise levels by using A.M. Peak Hour Volumes and truck percentages supplied by the traffic engineers as model inputs (refer to Section 3.4)

A summary of the model validation is presented in **Table 5**. Each of the monitored locations was able to be accurately modeled within the acceptable ±3 dBA range. Due to the relatively close proximity of the monitoring locations to Route 28 and absence of other major noise sources, traffic noise was the most dominant component of the acoustic environment at each monitoring location. The project-wide average difference between calculated noise levels and monitored noise levels was -1.1 decibels, which generally shows excellent agreement between monitored and modeled sound levels and suggests confidence in the modeling assumptions.

TABLE 5
COMPUTED VS. MEASURED SOUND LEVELS AT MEASUREMENT SITES

SITE ID	CNE	ADDRESS	MONITORED Leq (dBA)	TNM-COMPUTED Leq (dBA)	DIFFERENCE (dBA)
M1	A	14034 Sawteeth Way	62.5	59.5	-3.0
M2	B	14065 Keepers Park	64.8	64.4	-0.4
M3	B	14086 Asher View	55.5	58.3	2.8
M4	E	Centreville Road	67.2	64.3	-2.9
M5	E	Grainery Road	59.5	62.4	2.9

TABLE 5
(CONTINUED)

SITE ID	CNE	ADDRESS	MONITORED Leq (dBA)	TNM-COMPUTED Leq (dBA)	DIFFERENCE (dBA)
M6	D	Darkwood Drive	69.0	66.3	-2.7
M7	F	Centreville Elementary School (baseball field)	62.9	60.5	-2.4
M8	H	Compton Village Drive	61.0	59.3	-1.7
M9	I	14592 Castleford Court	58.7	57.5	-1.2
M10	K	7102 Centreville Road	70.8	68.9	-1.9
Average Difference					**-1.1**
Standard Deviation of Difference					**2.2**

4.5 PREDICTED EXISTING NOISE LEVELS

For calculation of loudest-hour noise levels throughout the study area, 689 receiver locations were added to the validated TNM run(s) to provide a comprehensive basis of comparison for the analysis of noise impacts from the existing and future project conditions. Using the appropriate loudest-hour traffic data, existing and future traffic noise levels were predicted for the measurement sites and the additional receiver locations. The computation methods and predicted noise levels are presented in the next section of this report.

The noise measurements provided valuable information on current noise conditions and the effects of terrain and shielding on sound propagation from the roadway to the nearby residential land uses. However, because existing noise levels are not always measured during the loudest hour of the day, the loudest-hour existing noise levels were computed using the appropriate traffic data as input. The predicted existing noise levels for the loudest hour of the day were then used as the baseline against which probable future noise levels are compared and potential noise impacts assessed.

Of the 689 total noise receptor sites (grouped into 12 CNEs), 37 receptor sites (within 7 of the 12 CNEs) are predicted to approach or exceed the NAC for the existing condition worst-case noise hour. For all studied sites, the predicted existing year noise levels range from 36 to 70 dBA. A discussion of the predicted existing noise levels for each of the CNEs is provided below. **Figure 2** presents the locations of all the CNEs and all of their respective modeled receptor sites. Calculated noise levels for all noise-sensitive sites are presented in **Table 7** and discussed below. (Due to the amount of data, this table is located in the Data Tables section.)

- Existing loudest hour noise levels within CNE A were predicted to range from 54 to 64 dBA. Zero noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE B were predicted to range from 40 to 65 dBA. Zero noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE C were predicted to range from 47 to 69 dBA. The interior noise level at receptor C-003 was predicted to be 48 dBA. Two noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE D were predicted to range from 47 to 70 dBA. There are 18 noise-sensitive sites predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE E were predicted to range from 36 to 70 dBA. Interior noise levels ranged from 36 to 45 dBA. Four noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels within CNE F were predicted to range from 43 to 64 dBA. The interior noise level at receptor F-021 was predicted to be 43 dBA. Zero noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 52 to 63 dBA within CNE G. Zero noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 42 to 66 dBA within CNE H. One noise-sensitive site is predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 45 to 68 dBA within CNE I. Five noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 48 to 69 dBA within CNE J. Six noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 55 to 68 dBA within CNE K. One noise-sensitive site is predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

- Existing loudest hour noise levels were predicted to range from 52 to 64 dBA within CNE L. Zero noise-sensitive sites are predicted to approach or exceed the NAC for the existing condition worst-case noise hour.

5.0 FUTURE NOISE ENVIRONMENT

This section discusses the noise prediction model and traffic data used as input to the noise prediction model and then presents a summary of the predicted noise levels.

5.1 PRESENTATION OF RESULTS

Table 6 summarizes the range of predicted noise levels by CNE. The table includes a description of each CNE and its land use, the FHWA Activity Category, and the loudest-hour traffic noise levels which are presented in terms of the A-weighted equivalent sound level (or Leq) in dBA. Loudest-hour noise levels were computed for 2016 existing conditions as well as the future design year (2040) proposed highway widening.

TABLE 6
RANGES OF PREDICTED EXTERIOR NOISE LEVELS FOR THE WORST HOUR

CNE	LAND USE- DESCRIPTION	ACTIVITY CATEGORY	RANGE OF PREDICTED EXTERIOR NOISE LEVELS AND IMPACTS FOR THE WORST HOUR			
			EXISTING SOUND LEVEL (dBA)		2040 BUILD SOUND LEVEL (dBA)	
			MIN	MAX	MIN	MAX
A	Residences south of Old Centreville Road	B	54	64	56	65
	Basketball court south of Old Centreville Road	C	56	56	59	59
B	Row homes west of Route 28 and south of Upperridge Road	B	40	65	41	65
	Keepers Park and Sara Marie Terrace playgrounds	C	56	59	57	62
C	Residences east of Route 28 and south of New Braddock Road	B	47	57	50	58
	Willow Creek Academy playground, Hoskins Hollow outdoor use area	C	51	69	52	71
	Willowcreek Academy (Interior)	D	48	48	50	50
D	Residences east of Route 28 and south of New Braddock Road	B	47	70	49	72
	Heritage Forest tennis courts	C	58	59	61	62
E	Single-family residences west of Route 28 and south of New Braddock Road	B	36	70	38	72
	Centreville United Methodist Church playground and Montessori Children's Center Playground	C	57	63	59	64
	Centreville United Methodist Church and Montessori Children's Center	D	36	45	39	47

TABLE 6
(CONTINUED)

CNE	LAND USE- DESCRIPTION	ACTIVITY CATEGORY	RANGE OF PREDICTED EXTERIOR NOISE LEVELS AND IMPACTS FOR THE WORST HOUR			
			EXISTING SOUND LEVEL (dBA)		2040 BUILD SOUND LEVEL (dBA)	
			MIN	MAX	MIN	MAX
F	Residences east of Route 28, north of Green Trails Boulevard	B	55	57	57	58
	Sports fields and playgrounds for Centreville Elementary School	C	56	64	58	66
	Centreville Elementary School	D	43	43	46	46
G	Homes east of Route 28, south of Green Trails Boulevard	B	52	63	54	66
H	Compton Village Drive homes	B	42	58	44	61
	Compton Village tennis courts	C	49	66	53	71
I	Row homes off Old Centreville Road, north of Compton Road and west of Route 28	B	45	68	46	70
J	Compton Village, north of Compton Road and east of Route 28	B	48	69	50	71
K	Residences along Route 28 with driveway access, south of Compton Road and west of Route 28	B	55	68	57	68
L	Residences along Route 28 with driveway access, south of Compton Road and east of Route 28	B	52	64	55	66

Figure 2 provides a location map for the CNEs, noise-sensitive receptors, 66 dBA Leq "contour" for the 2040 Build Alternative, and potential noise barrier locations. Each receptor is shown in **Figure 2** with a color-coded dot that indicates the status of each receptor according to its 2040 Build Alternative noise level.

Future design year (2040) noise levels are predicted to exceed the NAC within 10 of the 12 CNEs at a total of 81 noise-sensitive receptor sites. For all studied sites, the future design year (2040) exterior noise levels range from 38 dBA to 72 dBA. The increase in noise is attributable to an increase in overall traffic volumes along Route 28 as well as minor alterations in the source/receiver noise propagation path resulting from the construction of the additional travel lane.

- Future design year (2040) noise levels within CNE A are predicted to range from 56 to 65 dBA, with noise levels predicted to approach or exceed the NAC at zero noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE A.

- Future design year (2040) noise levels within CNE B are predicted to range from 41 to 65 dBA, with noise levels predicted to approach or exceed the NAC at zero noise-sensitive receptor locations. There is a maximum of 4 dBA increase over existing sound levels within CNE B. This increase occurs at Receptor B-099 as a result of the removal of terrain features required to accommodate the widening.

- Future design year (2040) noise levels within CNE C are predicted to range from 50 to 71 dBA, with noise levels predicted to approach or exceed the NAC at two noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE C. The interior noise level at Receptor C-003, Willow Creek Academy, was evaluated under Activity Category D in Table 3 (FHWA Noise Abatement Criteria). The design year future design year build (2040) condition noise level for the exterior is predicted to be 59 dBA. Since the exterior of the building is composed of masonry material and modern air conditioning is installed, the reduction in noise levels in the interior as a result of the building is predicted to be 20 dBA (FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance," December 2011). Therefore, the indoor noise level for the Academy is not predicted to experience noise impact (Under Activity Category D indoor NAC) in the existing condition.

- Future design year (2040) noise levels within CNE D are predicted to range from 49 to 72 dBA, with noise levels predicted to approach or exceed the NAC at 19 noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE D.

- Future design year (2040) noise levels within CNE E are predicted to range from 38 to 72 dBA, with noise levels predicted to approach or exceed the NAC at nine noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE E. The interior noise level at Receptors E-001 (Methodist Church) and E-006 (Montessori School) were evaluated under Activity Category D in Table 3 (FHWA Noise Abatement Criteria). The design year future design year build (2040) condition noise level for the exterior is predicted at E-001 to be 59 dBA and 67 dBA at E-006. Since the exterior for the buildings are composed of masonry material and modern air conditioning is installed, the reduction in noise levels in the interior as a result of the building is predicted to be 20 dBA (FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance," December 2011). Therefore, the indoor noise levels are not predicted to experience noise impact (Under Activity Category D indoor NAC) in the existing condition.

- Future design year (2040) noise levels within CNE F are predicted to range from 46 to 66 dBA, with noise levels predicted to approach or exceed the NAC at one noise-sensitive receptor location. There is a maximum of 3 dBA increase over existing sound levels within CNE F. The interior noise level at Receptor F-021, Centreville Elementary School, was evaluated under Activity Category D in Table 3 (FHWA Noise Abatement Criteria). The design year future design year build (2040) condition noise level for the exterior is predicted to be 66 dBA. Since the exterior of the building is composed of masonry material and modern air conditioning is installed, the reduction in noise levels in the interior as a result of the building is predicted to be 20 dBA (FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance," December 2011). Therefore, the indoor noise level is not predicted to experience noise impact (Under Activity Category D indoor NAC) in the existing condition.

- Future design year (2040) noise levels within CNE G are predicted to range from 54 to 66 dBA, with noise levels predicted to approach or exceed the NAC at one noise-sensitive receptor location. There is a maximum of 3 dBA increase over existing sound levels within CNE G.

- Future design year (2040) noise levels within CNE H are predicted to range from 44 to 71 dBA, with noise levels predicted to approach or exceed the NAC at two noise-sensitive receptor locations. There is a maximum of 5 dBA increase over existing sound levels within CNE H. This 5 dBA increase is noted at the Compton Village tennis courts (Receptors H-018 and H-021) and is primarily a result of the tennis courts close proximity to Route 28 coupled with the removal of terrain features required to accommodate the widening.

- Future design year (2040) noise level within CNE I are predicted to range from 46 to 70 dBA, with noise levels predicted to approach or exceed the NAC at 36 noise-sensitive receptor locations. There is a maximum of 5 dBA increase over existing sound levels within CNE I.

- Future design year (2040) noise levels within CNE J are predicted to range from 50 to 71 dBA, with noise levels predicted to approach or exceed the NAC at nine noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE J.

- Future design year (2040) noise levels at the athletic fields within CNE K are predicted to range from 57 to 68 dBA, with noise levels predicted to approach or exceed the NAC at one noise-sensitive receptor location. There is a maximum of 2 dBA increase over existing sound levels within CNE K.

- Future design year (2040) noise levels within CNE L are predicted to range from 55 to 66 dBA, with noise levels predicted to approach or exceed the NAC at one noise-sensitive receptor locations. There is a maximum of 3 dBA increase over existing sound levels within CNE L.

Table 7 (refer to Data Tables for receptor sound data tables) outlines all of the computed sound levels at all 689 of the modeled receptors included in the noise assessment. The noise-impacted sites have been highlighted in red. All impacts result from either an approach to or exceedance of the NAC. There are no impacts associated with the "substantial increase" impact threshold.

Table 8 presents a summary of the predicted noise impact for the 2016 existing condition and the future design year (2040) build alternative. The impacts are summarized for the entire study area, separately by FHWA Activity Category.

TABLE 8
NOISE IMPACT SUMMARY

SCENARIO	IMPACT TYPE [1]	NUMBER OF IMPACTED UNITS BY LAND USE AND FHWA ACTIVITY CATEGORY [2]				
		RESIDENTIAL EXTERIOR (B)	RECREATIONAL EXTERIOR (C)	INSTITUTIONAL INTERIOR (D)	COMMERCIAL EXTERIOR (E)	TOTAL
Existing	NAC	34	3	0	0	37
Build	NAC	76	5	0	0	81

1 "NAC" = Noise levels approach or exceed the FHWA Noise Abatement Criteria for applicable Activity Category.
2 The FHWA Activity Category is shown in parenthesis.

Table 9 presents a summary of the predicted noise impact for the 2016 existing condition and the future design year (2040) build alternative by CNE.

TABLE 9
PREDICTED TRAFFIC NOISE IMPACT BY COMMON NOISE ENVIRONMENT

CNE	LAND USE - DESCRIPTION	ACTIVITY CATEGORY	RANGE OF PREDICTED EXTERIOR NOISE LEVELS AND IMPACTS FOR THE WORST HOUR NUMBER OF IMPACTS	
			EXISTING	2040 BUILD
A	Residences south of Old Centreville Road	B	0	0
	Basketball court south of Old Centreville Road	C	0	0
B	Row homes west of Route 28 and south of Upperridge Road	B	0	0
	Keepers Park and Sara Marie Terrace playgrounds	C	0	0
C	Residences east of Route 28 and south of New Braddock Road	B	0	0
	Willow Creek Academy playground, Hoskins Hollow outdoor use area	C	2	2
	Willowcreek Academy (Interior)	D	0	0
D	Residences east of Route 28 and south of New Braddock Road	B	18	19
	Heritage Forest tennis courts	C	0	0
E	Single-family residences west of Route 28 and south of New Braddock Road	B	4	9

TABLE 9
(CONTINUED)

CNE	LAND USE - DESCRIPTION	ACTIVITY CATEGORY	RANGE OF PREDICTED EXTERIOR NOISE LEVELS AND IMPACTS FOR THE WORST HOUR	
			NUMBER OF IMPACTS	
			EXISTING	2040 BUILD
	Centreville United Methodist Church playground and Montessori Children's Center Playground	C	0	0
	Centreville United Methodist Church and Montessori Children's Center	D	0	0
F	Residences east of Route 28, north of Green Trails Boulevard	B	0	0
	Sports fields and playgrounds for Centreville Elementary School	C	0	1
	Centreville Elementary School	D	0	0
G	Homes east of Route 28, south of Green Trails Boulevard	B	0	1
H	Compton Village Drive homes	B	0	0
	Compton Village tennis courts	C	1	2
I	Row homes off Old Centreville Road, north of Compton Road and west of Route 28	B	5	36
J	Compton Village, north of Compton Road and east of Route 28	B	6	9
K	Residences along Route 28 with driveway access, south of Compton Road and west of Route 28	B	1	1
L	Residences along Route 28 with driveway access, south of Compton Road and east of Route 28	B	0	1
Total Impacted Dwellings			**37**	**81**

6.0 NOISE ABATEMENT DETERMINATION

Noise Abatement Determination is a three-phased approach. The first phase of the process is to determine if highway traffic noise abatement consideration is warranted for the affected communities and/or affected receptors. The warranted criterion specifically pertains to traffic noise impacted receptors, defined in Section 5. Since predicted noise levels for the future design year (2040) build condition approach or exceed the NAC and/or meet the substantial increase criterion, in accordance with VDOT's State Noise Abatement Policy, noise abatement considerations are warranted for these impacted noise-sensitive areas. Satisfying the warranted criterion is considered to be the first phase (Phase 1) of the three-phased noise abatement determination. Phases 2 and 3 (determining feasibility and reasonableness) are discussed below. Following completion of all three phases, a determination can be made related to the feasibility and reasonableness of the noise abatement options.

6.1 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 forms 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-Control Measures,
- Alteration of Horizontal and Vertical Alignments,
- Acoustical Insulation of Public-Use and Non-Profit Facilities,
- Acquisition of Buffer Land,
- Construction of Earth Berms, and
- Construction of Noise Barriers.

6.1.1 Traffic-Control Measures

Traffic-control measures (TCMs) such as speed limit restrictions, truck traffic restrictions, and other TCMs that may be considered for the reduction of noise emission levels) are not practical for this project. 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-mile-per-hour (mph) reduction in speed will result in only a 2 dBA decrease in noise level, which would not eliminate all impacts and is not perceptible to the typical human ear. Additionally, a reduction in speed is not practical for a limited-access highway and would be counterproductive to the project objective of alleviating traffic and reducing congestion.

6.1.2 Alteration of Horizontal and Vertical Alignments

Consistent with the Environmental Assessment documentation, complete realignment of Route 28 either horizontally or vertically is not included in the scope of the project as it would result in significant amounts of right-of-way and easement impacts to the adjacent private properties. Accordingly, the scope of this project is to widen Route 28 through construction of an additional travel lane in each direction. Minimal vertical profile adjustments are being made to address substandard vertical profile elements, but more drastic vertical changes are not feasible or proposed due to the impacts on the travelling public during construction and impacts on private property which would be required. The noise barriers being studied as part of this project have been placed to maximize their benefit to the surrounding properties and developments while also minimizing right-of-way, easement acquisition, and environmental impacts as well as maintaining access to proposed stormwater management facilities.

6.1.3 Acoustical Insulation of Public-Use and Non-Profit Facilities

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.

6.1.4 Acquisition of Buffering Land

The purchase of property 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.

6.1.5 Construction of Berms/Noise Barriers

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 compared to a single, connected barrier. The barrier's ability to attenuate noise decreases as the gap width increases.

Noise barriers and earth berms are often implemented into the highway design in response to the identified noise impacts. The effectiveness of a free-standing (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. In contrast, 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 difficult to meet in urban settings where residential properties often abut the proposed roadway corridor. In these situations, implementation of earth berms can require significant property acquisitions to accommodate noise mitigation, and 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 and make it unreasonable.

Availability of fill material to construct the berm also needs to be considered. On 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. Berms were not considered for this project due to right-of-way constraints.

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).

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) states:

> "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 barriers 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."

This documentation is located in **Appendix D**.

6.2 FEASIBILITY, REASONABLENESS, AND DESIGN GOALS

According to FHWA and VDOT guidelines, potential mitigation measures for warranted receptors must also be assessed for feasibility and reasonableness. Noise mitigation is required to be both "feasible" and "reasonable" to be recommended for construction.

6.2.1 Feasibility Criterion for Noise Barriers

All receptors that meet the warranted criterion must progress to the "feasible" phase. Phase 2 of the noise abatement criteria requires that both of the following acoustical and engineering conditions be considered. The noise abatement measure is said to be feasible if it meets both of the following criteria.

- **At least a 5 dBA highway traffic noise reduction at impacted receptors:** According to 23 CFR 772, FHWA requires the highway agency to determine the number of impacted receptors required to achieve at least 5 dBA of reduction. VDOT requires that 50% or more of the impacted receptors experience 5 dBA or more of insertion loss to be feasible.

- **The determination that it is possible to design and construct the noise abatement measure:** The factors related to the design and construction include safety, barrier height, topography, drainage, utilities, environmental impacts and maintenance of the abatement measure, maintenance access to adjacent properties, and general access to adjacent properties (i.e., arterial widening projects).

6.2.2 Reasonableness Criterion for Noise Barriers

All receptors that meet the feasibility criterion must progress to the “reasonableness” phase. Phase 3 of the noise abatement criteria requires that all of the following conditions be considered.

- **Viewpoints of the Benefited Receptors:** VDOT shall solicit the viewpoints of all benefited receptors (refer to Section 7.1) through certified mailings and obtain enough responses to document a decision as to whether or not there is a desire for the proposed noise abatement measure. Fifty percent (50%) or more of the respondents shall be required to favor the noise abatement measure in determining reasonableness. Community views in and of themselves are not sufficient for a barrier to be found reasonable if one or both of the other two reasonableness criteria are not satisfied.

- **Cost-Effectiveness:** 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 SF/BR.

Where multi-family housing includes balconies at elevations that exceed a 30-foot high barrier or the topography causes receptors to be above the elevation of a 30-foot barrier, these receptors are not assessed for barrier benefits and are not included in the computation of the barrier’s reasonableness.

6.2.3 Noise Reduction Design Goals

The design goal is a reasonableness factor indicating a specific reduction in noise levels that VDOT uses to identify that a noise abatement measure effectively reduces noise. The design goal establishes a criterion, selected by VDOT, which noise abatement must achieve. VDOT’s noise reduction design goal is defined as a 7 dBA of insertion loss for at least one impacted receptor, meaning that at least one impacted receptor is predicted to achieve a 7 dBA or greater noise reduction with the proposed barrier in place. The design goal is not the same as acoustic feasibility, which defines the minimum level of effectiveness for a noise abatement measure. Acoustic feasibility indicates that the noise abatement measure can, at a minimum, achieve a discernible reduction in noise levels.

Noise reduction is measured by comparing the future design year (2040) build condition pre- and post-barrier noise levels. This difference between unabated and abated noise levels is known as "insertion loss" (IL). It is important to optimize the noise barrier design to achieve the most effective noise barrier in terms of both noise reduction (insertion losses) and cost. Although at least a 5 dBA reduction is required to meet the feasibility criteria, the following tiered noise barrier abatement goals are used to govern barrier design and optimization.

- Reduction of future highway traffic noise by 7 dBA at one or more of the impacted receptor sites (required criterion)
- Reduction of future highway traffic noise levels to the low-60-decibel range when practical (desirable)
- Reduction of future highway traffic noise levels to existing noise levels when practical (desirable)

6.3 NOISE ABATEMENT RESULTS

Noise barriers were evaluated for the residences within CNE C, D, E, F, G, H, I, J, K, and L that are predicted to experience noise impacts in the build condition. The barrier locations are shown on the graphics located on **Figures 2A** through **2E**. An overview of the evaluated barrier parameters is shown in **Table 10**. A summary of the evaluated barriers acoustical performance and statistics is described in the following subsections. The detailed sound level results for each receptor are located in **Tables 11** through **22** (refer to Data Tables for sound levels data tables). The acoustical profiles and line of sight analysis graphics of the recommended noise barriers are located within Appendix C. The Warranted, Feasible, and Reasonable Worksheets completed for all impacted CNEs are included in Appendix E.

Note: Whilst the effects of reflection noise were not evaluated as part of this analysis, noise barriers constructed as part of this project will have an absorptive finish to minimize effect of reflection noise. In addition, per the Federal Highway Administration (FHWA), construction of a noise barrier should not result in a substantial increase in highway noise levels to receivers without a barrier on the opposite side of the highway (e.g. sites in CNE D, E, and F) . If both the direct noise levels and the reflected noise levels are not abated by natural or artificial terrain features, the noise increase is theoretically limited to 3 decibels due to a doubling of energy from the noise source. In practice, however, not all of the acoustical energy reflects back to the receiver. The barrier diffracts some of the energy over the barrier, some energy is reflected to points other than the receiver, some is scattered by ground coverings (e.g., grass and shrubs), and some is blocked by the vehicles on the highway. Additionally, some of the reflected energy to the receiver is lost due to the longer path that it must travel. Attempts to measure this reflective increase rarely show an increase of greater than 1-2 decibels.

TABLE 10
SUMMARY OF POTENTIAL NOISE BARRIERS EVALUATED IN THIS STUDY

CNE	BARRIER ID	NUMBER OF IMPACTED RECEPTORS	IMPACTED AND BENEFITTED RECEPTORS	NON-IMPACTED AND BENEFITTED RECEPTORS	NOISE BARRIER DETAILS				SURFACE AREA/ BENEFITTED RECEPTOR (SF/BR) [1]	FEASIBLE?	REASONABLE?
					LENGTH (FT)	AVERAGE HEIGHT RANGE (FT)	SURFACE AREA (SF)	COST AT $42/SF			
C	Barrier C1	2	2	2	400	18.0	7,193	$302,106	1,798	Yes	No
D	Barrier D1	18	18	17	976	23.7	23,095	$969,990	660	Yes	Yes
D	Barrier D2	1	1	0	274	15.0	4,107	$172,494	4,107	Yes	No
E	Barrier E1	6	6	7	1,056	18.4	19,469	$817,698	1,498	Yes	Yes
E	Barrier E2	3	3	1	448	15.3	6,876	$288,792	1,719	Yes	No
F	Barrier F1	1	1	2	500	11.8	5,900	$247,800	1,967	Yes	No
G	Barrier G1	1	1	1	513	10.0	5,133	$215,586	2,567	Yes	No
H	Barrier H1	2	2	0	350	12.0	4,204	$176,568	2,102	Yes	No
I	Barrier System I1 and I2	36	34	26	1,227	17.0	20,852	$875,784	348	Yes	Yes
J	Barrier J1	9	9	3	708	17.74	12,558	$527,436	1,047	Yes	Yes
K	Barrier K1	1	1	0	183	18.0	3,290	$138,180	3,290	Yes	No
L	Barrier System L1 and L2	1	1	1	578	30.0	17,356	$728,952	8,678	Yes	No

1 Where Square Feet/Benefitted Receptor (SF/BR) exceeds VDOT's maximum of 1,600, a noise barrier would not be considered cost-reasonable.

6.3.1 CNE C

6.3.1.1 Barrier C1

A single-noise-barrier configuration (Barrier C1) was evaluated for all the CNE C impacted receptors representing the Willowcreek Academy, south of Sunset Ridge Road and west of Old Centreville Road. **Table 11** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 18 feet in height, totals 400 feet in length, and has a total surface area of 7,193 SF benefitting four receptors (equating to 1,798 SF/BR). The barrier provides a noise reduction of 4 to 7 dBA and benefits two impacted receptors as well as two non-impacted receptors. The barrier provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.2 CNE D

There is driveway access to Darkwood Drive from Route 28 at the southern end of Barrier D1 and northern end of Barrier D2. This is to be maintained for access to the neighborhood by emergency vehicles and is blocked by a chain to prevent other vehicles from using it. Therefore, a barrier cannot be considered to cross the driveway and block emergency access.

6.3.2.1 Barrier D1

A single-noise-barrier configuration (Barrier D1) was evaluated for the impacted receptors north of the Driveway at the Darkwood Drive cul-de-sac in CNE D. **Table 12** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 23.7 feet in height, totals 976 feet in length, and has a total surface area of 23,095 SF benefitting 35 receptors (equating to 660 SF/BR). The barrier provides a noise reduction of 5 to 11 dBA and benefits 18 impacted receptors as well as 17 non-impacted receptors. The barrier provides an average noise reduction of 8 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to one impacted receptor. The barrier is considered **feasible and reasonable** pending public involvement.

VDOT policy includes provisions to combine individual noise barriers into a "noise barrier system" when each barrier is shown to provide feasible noise mitigation interdependently (i.e., at least 5 dBA insertion loss). Barrier D1 and D2 were analyzed to determine if the barriers could be combined into a system by analyzing the interdependency between the two barriers. Additional modeling sites were analyzed at Receptor D-075 on each side of the home facing the Route 28 corridor to comprehensively identify if Barrier D2 provides feasible noise (at least 5 dBA) reduction at the residence. All receptors analyzed behind Barrier D1, including the D-075 sites, receive 1 dBA or less from Barrier D2 and are not considered interdependent.

6.3.2.2 Barrier D2

A single-noise-barrier configuration (Barrier D2) was evaluated for the impacted receptors south of the Driveway at the Darkwood Drive cul-de-sac in CNE D. **Table 13** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 15 feet in height, totals 274 feet in length, and has a total surface area of 4,107 SF benefitting 1 receptor (equating to 4,107 SF/BR). The barrier provides a noise reduction of 7 dBA and benefits 1 impacted receptor and no additional non-impacted receptors. The barrier provides an average noise reduction of 7 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to one impacted receptor. The barrier would also require relocation of overhead electrical utilities which potentially would encroach upon the residential property ROW. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

VDOT policy includes provisions to combine individual noise barriers into a "noise barrier system" when each barrier is shown to provide feasible noise mitigation interdependently (i.e., at least 5 dBA insertion loss). Barrier D1 and D2 were analyzed to determine if the barriers could be combined into a system by analyzing the interdependency between the two barriers. Receptor D-086 was analyzed to determine if Barrier D1 provides feasible noise (at least 5 dBA) reduction at the residence. Receptor D-086 receives no acoustical benefit from the construction D1 and therefore Barriers D1 and D2 are not considered interdependent.

6.3.3 CNE E

6.3.3.1 Barrier E1

A single-noise-barrier configuration (Barrier E1) was evaluated for the northern impacted receptors in CNE E, located south of Old Centreville Road along Harvest Mill Court and south to the tennis courts located near the intersection of Wheat Mill Way and Grainery Road. **Table 14** (see Data Tables) outlines the performance of the optimized barrier scenario.

Barrier E1 averages 18.4 feet in height, totals 1,056 feet in length, and has a total surface area of 19,469 SF benefitting 13 receptors (equating to 1,498 SF/BR). The barrier provides a noise reduction of 7 to 11 dBA and benefits all six of the impacted receptors as well as seven non-impacted receptors. The barrier provides an average noise reduction of 9 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to more than one impacted receptor. The barrier is considered **feasible and reasonable** pending public involvement.

6.3.3.2 Barrier E2

A single-noise-barrier configuration (Barrier E2) was evaluated for the southern impacted receptors in CNE E, located south of Old Centreville Road along Harvest Mill Court and south to the tennis courts located just north of the intersection of Old Mill Road and Centreville Road. **Table 15** (see Data Tables) outlines the performance of the optimized barrier scenario.

Barrier E2 averages 15 feet in height, totals 448 feet in length, and has a total surface area of 6,876 SF benefitting 4 receptors (equating to 1,719 SF/BR). The barrier provides a noise reduction of 5 to 7 dBA and benefits all three of the impacted receptors as well as one non-impacted receptor. The barrier provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to at least one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.4 CNE F

6.3.4.1 Barrier F1

A single-noise-barrier configuration (Barrier F1) was evaluated for the southern impacted receptors in CNE F, located north of the Green Trails Boulevard at the Centreville Elementary School. **Table 16** (see Data Tables) outlines the performance of the optimized barrier scenario.

Barrier F1 averages 12 feet in height, totals 500 feet in length, and has a total surface area of 5,900 SF benefitting three receptors (equating to 1,966 SF/BR). The barrier provides a noise reduction of 6 to 7 dBA and benefits the single impacted receptor as well as two non-impacted receptors. The barrier provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to at least one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.5 CNE G

6.3.5.1 Barrier G1

A single-noise-barrier configuration (Barrier G1) was evaluated for all the CNE G impacted receptors off Compton Village Drive that back up to Green Trails Boulevard and Centreville Road. **Table 17** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 10 feet in height, totals 513 feet in length, and has a total surface area of 5,133 SF benefitting two receptors (equating to 2,567 SF/BR). The barrier provides a noise reduction of 6 to 7 dBA and benefits the single impacted receptor as well as one non-impacted receptor. The barrier provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to at least one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.6 CNE H

6.3.6.1 Barrier H1

A single-noise-barrier configuration (Barrier H1) was evaluated for all the CNE H impacted receptors (Compton Village HOA Tennis Court) off Compton Village Drive, just south of Tallavast Drive. **Table 18** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 12 feet in height, totals 350 feet in length, and has a total surface area of 4,204 SF benefitting two receptors (equating to 2,102 SF/BR). The barrier provides a noise reduction of 6 to 7 dBA and benefits both impacted receptors and no additional non-impacted receptors. The barrier provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to at least one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.7 CNE I

6.3.7.1 Barrier System I1-I2

A two-noise-barrier configuration (Barriers I1 and I2) was evaluated for all the CNE I impacted receptors along Olde Centreville Road, north of Ordway Road and west of Centreville Road. The split in the barrier system is required to accommodate the walking trail that parallels Route 28. The noise barrier protects residences within the Crofton Commons community. The barriers were evaluated as a system since they were shown to work interdependently. **Table 19** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barriers average 17 feet in height, total 1,227 feet in length, and have a total surface area of 20,852 SF benefitting 60 receptors (equating to 348 SF/BR). The barriers provide a noise reduction of 5 to 10 dBA and benefits 34 of the impacted receptors as well as 26 non-impacted receptors. The barrier provides an average noise reduction of 7 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 94% of the impacted locations (greater than 50%). Two of the impacted receptors are not benefited because the southern terminus of the barrier cannot be lengthened to the south any further due to engineering and sight light requirements. The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to more than one impacted receptor. The barrier configuration is considered **feasible and reasonable** pending public involvement.

6.3.8 CNE J

6.3.8.1 Barrier J1

A single-noise-barrier configuration (Barrier J1) was evaluated for the CNE J impacted receptors in the Compton Village community along Pittman Court and Drifton Court. **Table 20** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 17.74 feet in height, totals 708 feet in length, and has a total surface area of 12,558 SF benefitting 12 receptors (equating to 1,047 SF/BR). The barrier provides a noise reduction of 5 to 11 dBA and benefits nine impacted receptors as well as three non-impacted receptors. The barrier provides an average noise reduction of 7 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to more than one impacted receptor. The barrier configuration is considered **feasible and reasonable** pending public involvement.

6.3.9 CNE K

6.3.9.1 Barrier K1

A single-noise-barrier configuration (Barrier K1) was evaluated for all of the CNE K impacted receptors along Centreville Road with direct driveway access to Route 28. **Table 21** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barrier averages 18 feet in height, totals 183 feet in length, and has a total surface area of 3,290 SF benefitting one receptor (equating to 3,290 SF/BR). The barrier provides a noise reduction of 8 dBA and benefits one impacted receptor and no additional non-impacted receptors. The barrier provides an average noise reduction of 8 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier also meets the 7 dBA design goal since it provides a noise reduction of at least 7 dBA to one impacted receptor. The barrier is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

6.3.10 CNE L

6.3.10.1 Barrier System L1-L2

A two-noise-barrier configuration (Barriers L1 and L2) was evaluated for impacted Receptors in CNE L. The breaks in the barrier system were required due to private driveways. The barriers were evaluated as a system since they were shown to work interdependently. **Table 22** (see Data Tables) outlines the performance of the optimized barrier scenario.

The barriers average 30 in height, are 578 feet in length, and have a total surface area of 17,356 SF benefitting two receptors (equating to 8,678 SF/BR). The barriers provide a noise reduction of 5 to 6 dBA and benefit the single impacted receptor and one non-impacted benefitted receptor. The barrier system provides an average noise reduction of 6 dBA to the benefitted receptors. The barrier is feasible since it provides at least a 5 dBA reduction to 100% of the impacted locations (greater than 50%). The barrier does not meet the 7 dBA design goal since it does not provide a noise reduction of at least 7 dBA to at least one impacted receptor. The barrier system is considered **feasible but not reasonable** due to a SF/BR calculation above the specified 1,600 SF/BR.

TABLE 23
SUMMARY OF FEASIBLE AND REASONABLE NOISE BARRIERS

CNE	BARRIER ID	INSERTION LOSS (DBA)*		HEIGHT (FT)		LENGTH (FT)	AREA (SF)	TOTAL # IMPACTED UNITS	BENEFITTED UNITS			FT² PER BENEFITTED RECEPTOR	COST ($42.00/FT²)
		RANGE	AVERAGE	RANGE	AVERAGE				IMPACTS	NON-IMPACTS	TOTAL		
D	Barrier D1	5-11	8	21-27	23.7	976	23,095	18	18	17	35	660	$969,990
E	Barrier E1	7-11	9	16-20	18.4	1,056	19,469	6	6	7	13	1,498	$817,698
I	Barrier System I1 and I2	5-12	7	17	17	1,227	20,852	36	34	26	60	348	$875,784
J	Barrier J1	5-10	7	16-27	17.74	708	12,558	9	9	3	12	1,047	$527,436

* Insertion Loss statistics are calculated for all benefitted receptors

7.0 PUBLIC INVOLVEMENT/LOCAL OFFICIALS COORDINATION

FHWA and VDOT policies require that VDOT provide certain information to local officials within whose jurisdiction the highway project is located in order 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 details on noise-compatible land-use planning and noise impact zones for undeveloped lands within the project corridor. The aforementioned details are provided below. Additional information about VDOT's noise abatement program has also been included in this section.

7.1 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 involvement process. 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 and a Final NADR will be prepared detailing the results of the survey.

7.2 INFORMATION FOR LOCAL GOVERNMENT OFFICIALS NOISE-COMPATIBLE LAND-USE PLANNING

Sections 12.1 and 12.2 of VDOT's current noise policy outline VDOT's approach to communication with local officials and provides 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 below: https://www.fhwa.dot.gov/environMent/noise/noise_compatible_planning/federal_approach/land_use/qz10.cfm.

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

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

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

7.3 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. Any noise-sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels.

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments and are often times useful to local officials in undeveloped corridors. Highway traffic noise is considered a linear noise source and sound levels can drop considerably over distance. The degree that sound levels decrease can vary based on a number of different factors including objects that shield the roadway noise, terrain features, and ground cover type (e.g., pavement, grass, or snow). The use of noise level contours has become increasingly popular over the last several years, as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66-dBA noise contour). **Figure 2** shows the approximate 66-dBA noise level contours for the study area when considering the proposed improvements and the Design Year (2040) traffic volumes, speeds, and composition. This 66-dBA noise contour can be used to approximate the distance away from Route 28 in which the NAC will be exceeded for an Activity Category B receptor (e.g., the most common receptor).

7.4 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 barrier information, and a downloadable noise barrier brochure.

8.0 CONSTRUCTION NOISE

Throughout the construction of Route 28 project, noise-sensitive land uses that are analyzed for traffic noise impacts are also susceptible to construction noise impacts. Typical highway construction/reconstruction equipment (such as loaders, dump trucks, graders, bulldozers, etc.) are likely to temporarily elevate noise within the project area. Sensitive receptors within 100 to 200 feet of construction activities may experience varying periods and degrees of noise impacts, with potential noise levels between 75 and 85 dBA, depending on the nature of the construction activity, the type of equipment in use, and the relative nearness to the activity.

VDOT is concerned with noise generated during the construction phase of the proposed project. While the degree of construction noise impact will vary, it is directly related to the types and number of equipment used and the proximity to the noise-sensitive land uses within the project area. Land uses that are sensitive to traffic noise, are also potentially considered to be sensitive to construction noise. Any construction noise impacts that do occur as a result of roadway construction measures are anticipated to be temporary in nature and will cease upon completion of the project construction phase. 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 2020 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.

Construction noise can be minimized by implementing specific measures to help mitigate the noise at the source. The contractor shall exercise proper maintenance procedures for all construction equipment regularly and thoroughly. Replacement of failing or ineffective muffling and exhaust systems, periodic lubrication of moving parts, and properly tuned engines are necessary in order to keep construction equipment noise emissions to a minimum.

The following construction noise related items are included in VDOT’s 2020 Road and Bridge Specifications:

- The Contractor’s operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels. Such noise level measurements shall be taken at a point on the perimeter of the construction limit that is closest to the adjoining property on which a noise-sensitive activity is occurring. A noise-sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose and not present an unreasonable public nuisance. Such activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.

- The Department may monitor construction-related noise. If construction noise levels exceed 80 decibels during noise-sensitive activities, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.

- The Department may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 P.M. and 6 A.M. If other hours are established by local ordinance, the local ordinance shall govern.

- Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.

- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

- These requirements shall not be applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.

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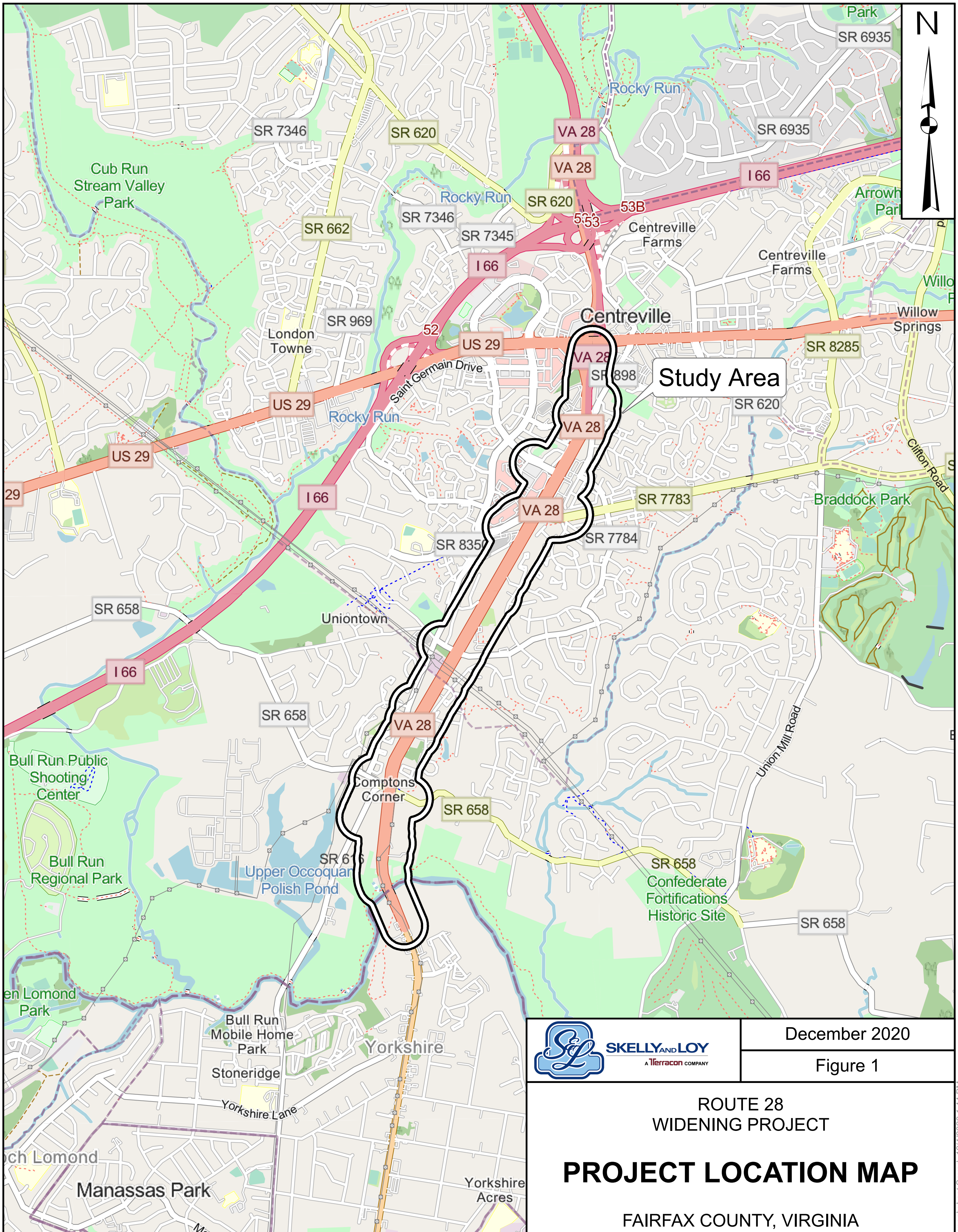
11.0 MAPPING



Map data © OpenStreetMap contributors, Map layer by Esri

SKELLY AND LOY
A Terracon COMPANY

December 2020

Figure 1

ROUTE 28
WIDENING PROJECT

PROJECT LOCATION MAP

FAIRFAX COUNTY, VIRGINIA

Job No.: JN197295

1 inch = 3,000 Feet

User: dtmeneely Last Saved: 12/4/2020 1:44 PM

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COMMON NOISE ENVIRONMENTS

STUDY AREA

66 DBA CONTOUR

POTENTIAL BARRIERS

BARRIER FEASIBLE NOT REASONABLE

BARRIER FEASIBLE AND REASONABLE

MODELED NOISE RECEPTORS

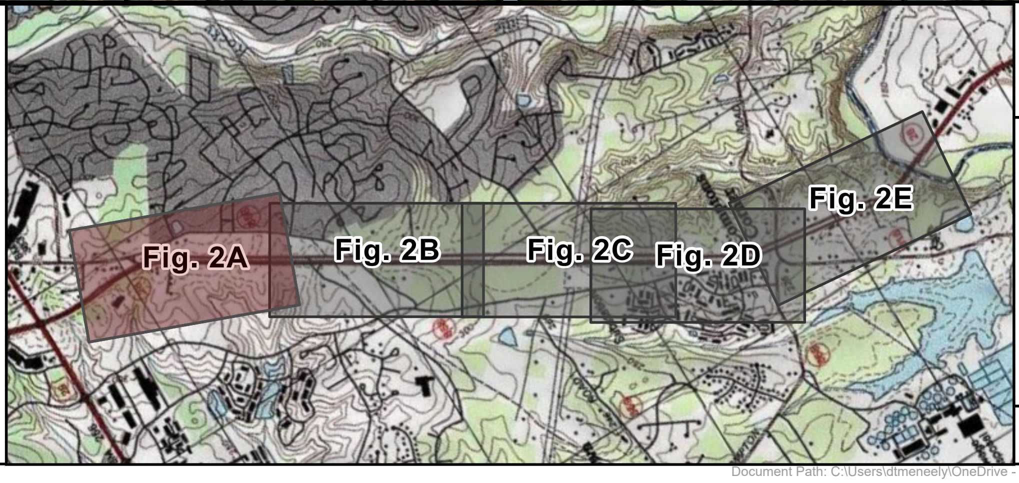
IMPACTED, BENEFITTED

IMPACTED. NOT BENEFITTED

NOT IMPACTED, BENEFITTED

NOT IMPACTED, NOT BENEFITTED

NOISE MEASUREMENT LOCATION



SKELLY AND LOY A Terracon COMPANY

May 2021

Figure 2

ROUTE 28 WIDENING PROJECT

PRINCE WILLIAM COUNTY LINE, BRIDGE OVER BULL RUN, TO ROUTE 29 IN CENTREVILLE
COMMON NOISE ENVIRONMENTS,
NOISE RECEPTOR AND MITIGATION LOCATIONS

FAIRFAX COUNTY, VIRGINIA

Job No. JN197295 | 1 inch = 210 Feet

COMMON NOISE ENVIRONMENTS

STUDY AREA

66 DBA CONTOUR

POTENTIAL BARRIERS

BARRIER FEASIBLE NOT REASONABLE

BARRIER FEASIBLE AND REASONABLE

MODELED NOISE RECEPTORS

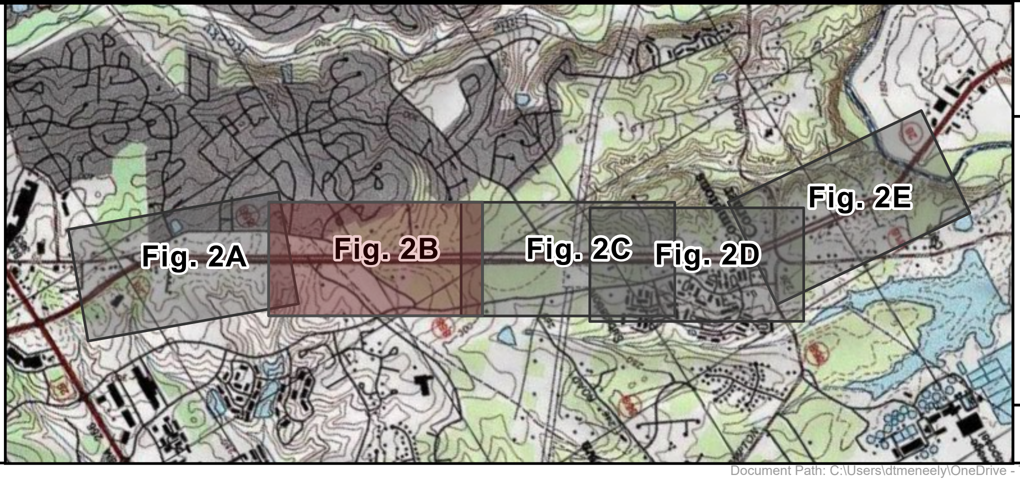
IMPACTED, BENEFITTED

IMPACTED. NOT BENEFITTED

NOT IMPACTED, BENEFITTED

NOT IMPACTED, NOT BENEFITTED

NOISE MEASUREMENT LOCATION



SKELLY AND LOY
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May 2021

Figure 2

ROUTE 28 WIDENING PROJECT

PRINCE WILLIAM COUNTY LINE, BRIDGE OVER BULL RUN, TO ROUTE 29 IN CENTREVILLE
COMMON NOISE ENVIRONMENTS,
NOISE RECEPTOR AND MITIGATION LOCATIONS

FAIRFAX COUNTY, VIRGINIA

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COMMON NOISE ENVIRONMENTS

STUDY AREA

66 DBA CONTOUR

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BARRIER FEASIBLE AND REASONABLE

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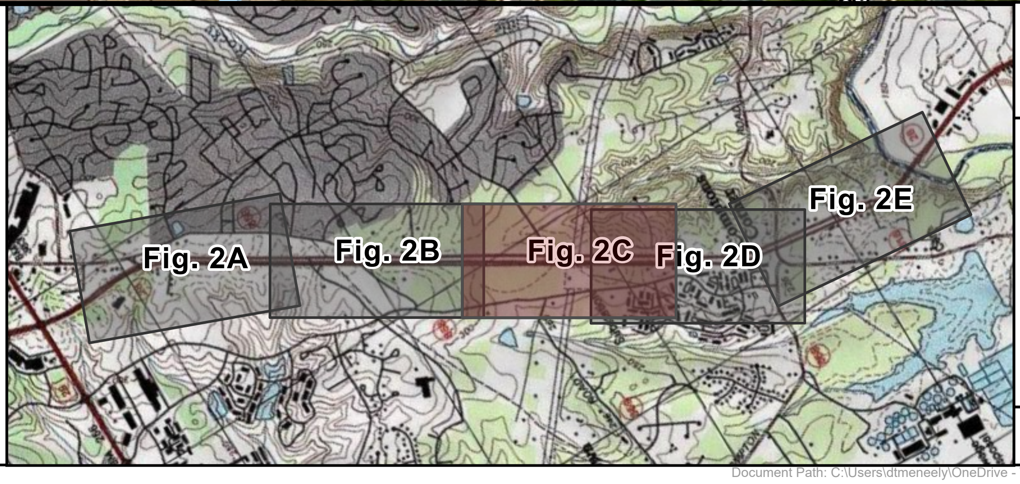
NOT IMPACTED, BENEFITTED

NOT IMPACTED, NOT BENEFITTED

NOISE MEASUREMENT LOCATION



SKELLY AND LOY
A Terracon COMPANY

May 2021

Figure 2

ROUTE 28 WIDENING PROJECT

PRINCE WILLIAM COUNTY LINE, BRIDGE OVER BULL RUN, TO ROUTE 29 IN CENTREVILLE
COMMON NOISE ENVIRONMENTS, NOISE RECEPTOR AND MITIGATION LOCATIONS

FAIRFAX COUNTY, VIRGINIA

Job No. JN197295

1 inch = 210 Feet

COMMON NOISE ENVIRONMENTS

STUDY AREA

66 DBA CONTOUR

POTENTIAL BARRIERS

BARRIER FEASIBLE NOT REASONABLE

BARRIER FEASIBLE AND REASONABLE

MODELED NOISE RECEPTORS

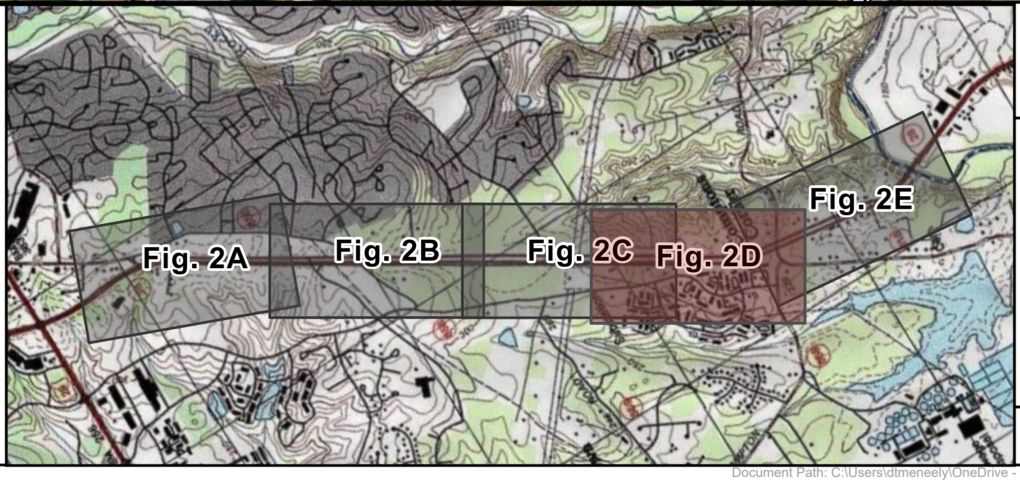
IMPACTED, BENEFITTED

IMPACTED. NOT BENEFITTED

NOT IMPACTED, BENEFITTED

NOT IMPACTED, NOT BENEFITTED

NOISE MEASUREMENT LOCATION



SKELLY AND LOY
A Terracon COMPANY

May 2021

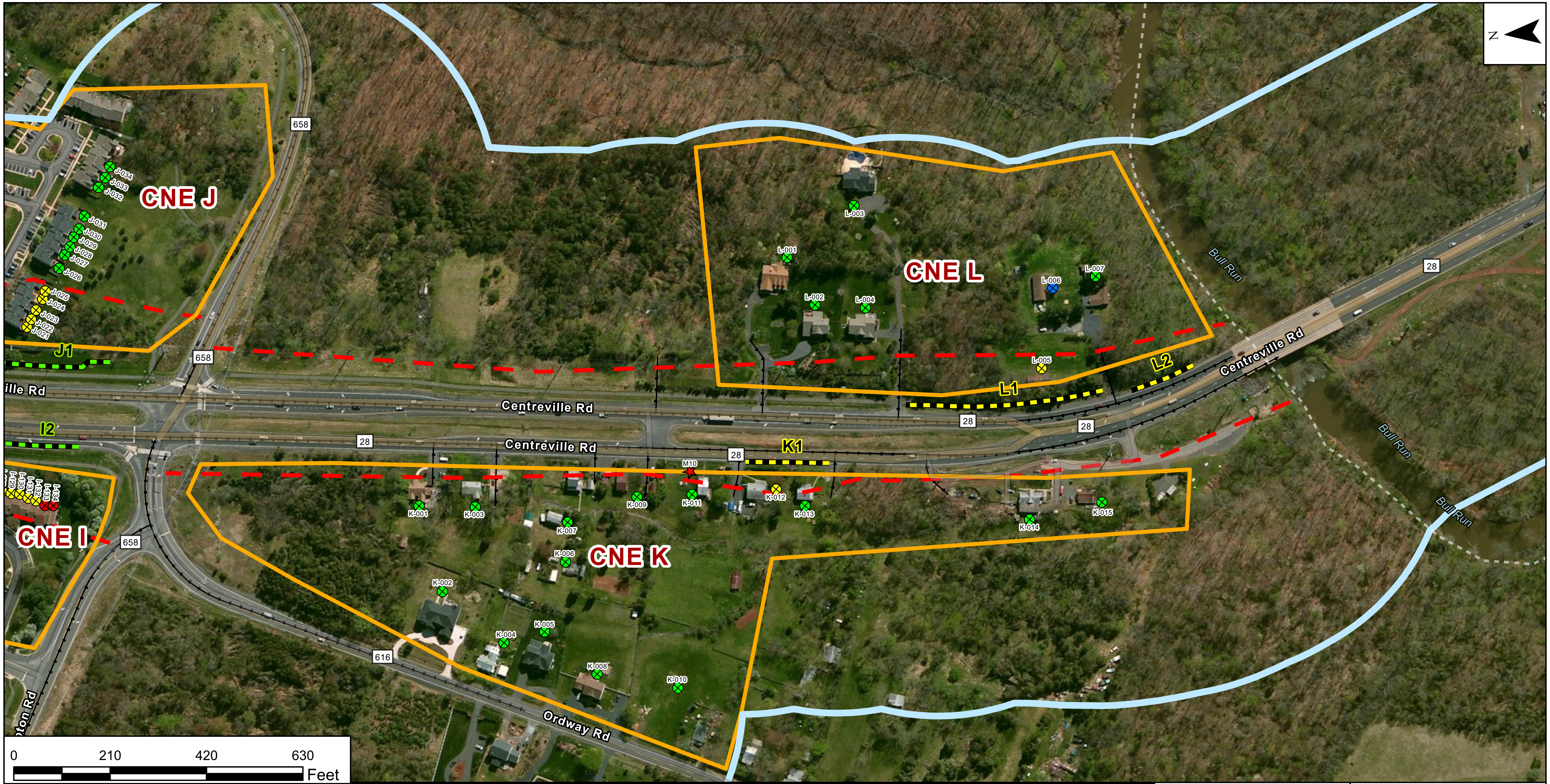
Figure 2

ROUTE 28 WIDENING PROJECT

PRINCE WILLIAM COUNTY LINE, BRIDGE OVER BULL RUN, TO ROUTE 29 IN CENTREVILLE
COMMON NOISE ENVIRONMENTS,
NOISE RECEPTOR AND MITIGATION LOCATIONS

FAIRFAX COUNTY, VIRGINIA

Job No. JN197295 | 1 inch = 210 Feet



COMMON NOISE ENVIRONMENTS

STUDY AREA

66 DBA CONTOUR

POTENTIAL BARRIERS

BARRIER FEASIBLE NOT REASONABLE

BARRIER FEASIBLE AND REASONABLE

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IMPACTED, BENEFITTED

IMPACTED. NOT BENEFITTED

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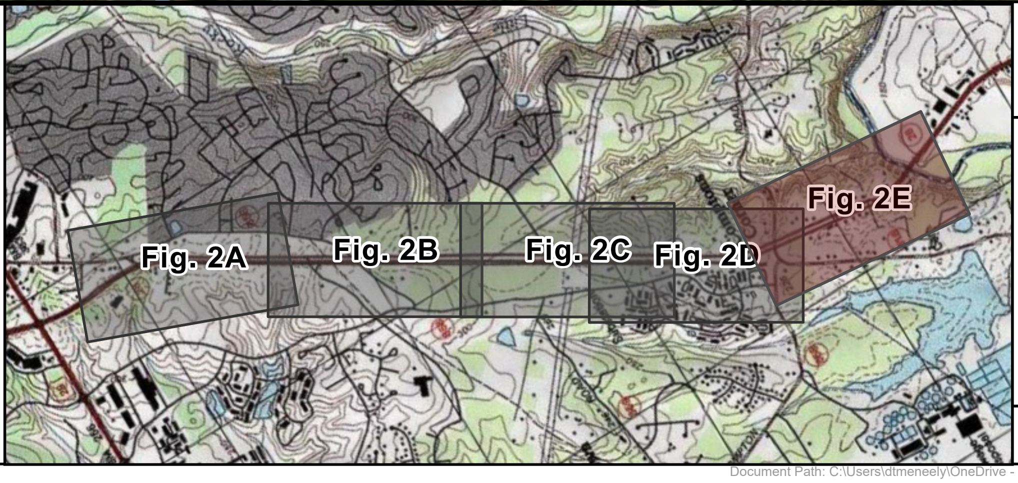
NOISE MEASUREMENT LOCATION



SKELLY AND LOY
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May 2021

Figure 2

ROUTE 28 WIDENING PROJECT

PRINCE WILLIAM COUNTY LINE, BRIDGE OVER BULL RUN, TO ROUTE 29 IN CENTREVILLE
COMMON NOISE ENVIRONMENTS, NOISE RECEPTOR AND MITIGATION LOCATIONS

FAIRFAX COUNTY, VIRGINIA

Job No. JN197295

1 inch = 210 Feet

12.0 DATA TABLES

TABLE 7

ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
CNE A	A-001	14034 SAWTEETH WAY, Row 1 Flr1	1	B	Res	66	60	62	0
	A-002	14030 SAWTEETH WAY, Row 1 Flr1	1	B	Res	66	56	58	0
	A-003	14017 SAWTEETH WAY, Row 1 Flr1	1	B	Res	66	61	63	0
	A-004	14015 SAWTEETH WAY, Row 2 Flr1	1	B	Res	66	60	62	0
	A-005	14046 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	64	65	0
	A-006	14013 SAWTEETH WAY, Row 2 Flr1	1	B	Res	66	59	60	0
	A-007	14044 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	60	62	0
	A-008	14042 GILL BROOK LN, Row 3 Flr1	1	B	Res	66	61	63	0
	A-009	14011 SAWTEETH WAY, Row 2 Flr1	1	B	Res	66	58	59	0
	A-010	14040 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	57	60	0
	A-011	14009 SAWTEETH WAY, Row 2 Flr1	1	B	Res	66	56	58	0
	A-012	14007 SAWTEETH WAY, Row 2 Flr1	1	B	Res	66	55	57	0
	A-013	14038 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	60	61	0
	A-014	14036 GILL BROOK LN, Row 3 Flr1	1	B	Res	66	59	61	0
	A-015	14034 GILL BROOK LN, Row 3 Flr1	1	B	Res	66	55	57	0
	A-016	14032 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	54	56	0
	A-017	14030 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	57	59	0
	A-018	14028 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	57	58	0
	A-019	14026 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	56	57	0
	A-020	13983 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	59	61	0
	A-021	13983 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	57	60	0
	A-022	13981 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	57	60	0
	A-023	13979 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	56	59	0
	A-023	13979 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	56	59	0
	A-024	13975 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	55	58	0
	A-025	13977 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	56	59	0
	A-026	13975 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	55	58	0
	A-027	13975 GILL BROOK LN, Row 2 Flr1	1	B	Res	66	55	58	0
	A-028	6009 OLD CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	60	62	0
	A-029	LRR HOA Basketball Court, 13975 GILL BROOK LN, Row 2 Flr1	1	C	Rec	66	56	59	0
	B-001	14077 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	54	55	0
	B-002	14075 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	54	55	0
	B-003	14085 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	50	51	0
	B-004	14087 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	50	51	0
	B-005	14087 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	53	54	0
	B-006	14083 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	50	51	0
	B-007	14081 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	59	60	0
	B-008	14047 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	53	54	0
	B-009	14073 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	54	54	0
	B-010	14047 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	50	51	0
	B-011	14097 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	46	48	0
	B-012	14071 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	53	54	0
	B-013	14097 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	52	53	0
	B-014	Keepers Park Residential Playground, 14055 KEEPERS PARK, Row 2	1	C	Rec	66	56	57	0
	B-015	14071 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	52	54	0
	B-016	14069 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	52	54	0
	B-017	14130 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	55	56	0
	B-018	14069 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	52	53	0
	B-019	14047 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	53	54	0
	B-020	14132 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	51	52	0
	B-021	14067 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	52	53	0
	B-022	14051 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	54	55	0
	B-023	14053 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	54	55	0
	B-024	14134 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	50	52	0
	B-025	14065 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	51	53	0
	B-026	14053 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	55	56	0
	B-027	14136 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	48	50	0
	B-028	14055 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	56	57	0
	B-029	14057 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	57	57	0
	B-030	14138 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	48	49	0
	B-031	14128 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	50	51	0
	B-032	14057 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	58	59	0
	B-033	14126 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	45	47	0
	B-034	14059 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	59	60	0
	B-035	14162 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	43	44	0
	B-036	14061 KEEPERS PARK, Row 2 Flr1	1	B	Res	66	61	62	0
	B-037	14124 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	45	46	0
	B-038	14061 KEEPERS PARK, Row 1 Flr1	1	B	Res	66	64	65	0
	B-039	14160 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	46	47	0
	B-040	14114 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	59	60	0
	B-041	14122 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	44	46	0
	B-042	14158 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	47	48	0
	B-043	14120 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	45	46	0
	B-044	14112 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	57	58	0
	B-045	14156 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	49	50	0
	B-046	6023 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	46	48	0
	B-047	14154 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	44	45	0
	B-048	14110 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	52	53	0
	B-049	6023 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	45	47	0
	B-050	14152 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	43	45	0
	B-051	14108 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	46	48	0
	B-052	14150 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	43	45	0
	B-053	6025 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	45	47	0
	B-054	14106 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	47	49	0
	B-055	6022 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	57	59	0
	B-056	6027 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-057	6024 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	63	63	0
	B-058	14104 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	45	47	0
	B-059	6026 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	65	65	0
	B-060	6029 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0

TABLE 7

ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA) 2016 Existing	2040 Build	2040 Mitigation
CNE B	B-061	14102 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	46	47	0
	B-062	6031 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-063	14141 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	46	48	0
	B-064	14100 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	50	52	0
	B-065	6033 ANNE MARIE TER, Row 3 Flr1	1	B	Res	66	45	47	0
	B-066	14143 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	45	47	0
	B-067	14145 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	45	47	0
	B-068	6032 ANNE MARIE TER, Row 1 Flr1	1	B	Res	66	61	61	0
	B-069	6030 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	58	61	0
	B-070	14147 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	47	49	0
	B-071	6030 ANNE MARIE TER, Row 2 Flr1	1	B	Res	66	65	65	0
	B-072	14149 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	48	49	0
	B-073	14101 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	50	52	0
	B-074	14151 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	49	51	0
	B-075	6077 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-076	14103 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	47	49	0
	B-077	6079 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-078	14105 GABRIELLE WAY, Row 2 Flr1	1	B	Res	66	47	49	0
	B-079	6081 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	44	45	0
	B-080	14107 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	46	47	0
	B-081	Sara Marie Terrace Playground, 6080 SARA MARIE TER, Row 1	1	C	Rec	66	59	62	0
	B-082	6083 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-083	6078 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	58	61	0
	B-084	6080 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	60	63	0
	B-085	14111 GABRIELLE WAY, Row 1 Flr1	1	B	Res	66	52	53	0
	B-086	6085 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	44	46	0
	B-087	6082 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	62	64	0
	B-088	6087 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	45	47	0
	B-089	14113 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	56	55	0
	B-090	6089 SARA MARIE TER, Row 2 Flr1	1	B	Res	66	46	47	0
	B-091	14115 GABRIELLE WAY, Row 3 Flr1	1	B	Res	66	57	58	0
	B-092	14141 ASHER VW, Row 3 Flr1	1	B	Res	66	50	51	0
	B-093	14139 ASHER VW, Row 3 Flr1	1	B	Res	66	50	51	0
	B-094	14139 ASHER VW, Row 3 Flr1	1	B	Res	66	50	52	0
	B-095	6088 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	57	60	0
	B-096	14137 ASHER VW, Row 3 Flr1	1	B	Res	66	50	51	0
	B-097	6086 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	59	62	0
	B-098	14135 ASHER VW, Row 3 Flr1	1	B	Res	66	50	52	0
	B-099	6084 SARA MARIE TER, Row 1 Flr1	1	B	Res	66	61	65	0
	B-100	14133 ASHER VW, Row 3 Flr1	1	B	Res	66	50	52	0
	B-101	14131 ASHER VW, Row 5 Flr1	1	B	Res	66	51	52	0
	B-102	14127 ASHER VW, Row 2 Flr1	1	B	Res	66	51	52	0
	B-103	14127 ASHER VW, Row 2 Flr1	1	B	Res	66	51	52	0
	B-104	14125 ASHER VW, Row 2 Flr1	1	B	Res	66	51	53	0
	B-105	14123 ASHER VW, Row 2 Flr1	1	B	Res	66	52	53	0
	B-106	14121 ASHER VW, Row 2 Flr1	1	B	Res	66	52	54	0
	B-107	14119 ASHER VW, Row 1 Flr1	1	B	Res	66	53	54	0
	B-108	14115 ASHER VW, Row 2 Flr1	1	B	Res	66	54	55	0
	B-109	14113 ASHER VW, Row 1 Flr1	1	B	Res	66	56	56	0
	B-110	6116 KENDRA WAY, Row 1 Flr1	1	B	Res	66	52	53	0
	B-111	14111 ASHER VW, Row 1 Flr1	1	B	Res	66	57	58	0
	B-112	6120 KENDRA WAY, Row 1 Flr1	1	B	Res	66	50	51	0
	B-113	6112 KENDRA WAY, Row 1 Flr1	1	B	Res	66	53	54	0
	B-114	14111 ASHER VW, Row 1 Flr1	1	B	Res	66	58	59	0
	B-115	6120 KENDRA WAY, Row 3 Flr1	1	B	Res	66	40	42	0
	B-116	6112 KENDRA WAY, Row 1 Flr1	1	B	Res	66	54	55	0
	B-117	14109 ASHER VW, Row 1 Flr1	1	B	Res	66	58	59	0
	B-118	6122 KENDRA WAY, Row 2 Flr1	1	B	Res	66	40	41	0
	B-119	6110 KENDRA WAY, Row 2 Flr1	1	B	Res	66	54	56	0
	B-120	14107 ASHER VW, Row 1 Flr1	1	B	Res	66	60	61	0
	B-121	6124 KENDRA WAY, Row 2 Flr1	1	B	Res	66	40	41	0
	B-122	6108 KENDRA WAY, Row 1 Flr1	1	B	Res	66	56	57	0
	B-123	14103 ASHER VW, Row 1 Flr1	1	B	Res	66	64	64	0
	B-124	6106 KENDRA WAY, Row 1 Flr1	1	B	Res	66	57	58	0
	B-125	6126 KENDRA WAY, Row 3 Flr1	1	B	Res	66	41	42	0
	B-126	6104 KENDRA WAY, Row 1 Flr1	1	B	Res	66	58	60	0
	B-127	6128 KENDRA WAY, Row 3 Flr1	1	B	Res	66	41	42	0
	B-128	6102 KENDRA WAY, Row 1 Flr1	1	B	Res	66	60	62	0
	B-129	6130 KENDRA WAY, Row 3 Flr1	1	B	Res	66	41	43	0
	B-130	6100 KENDRA WAY, Row 1 Flr1	1	B	Res	66	63	64	0
	B-131	6132 KENDRA WAY, Row 3 Flr1	1	B	Res	66	45	47	0
	B-132	6134 KENDRA WAY, Row 3 Flr1	1	B	Res	66	41	43	0
	B-133	6136 KENDRA WAY, Row 3 Flr1	1	B	Res	66	40	42	0
	B-134	14099 ASHER VW, Row 2 Flr1	1	B	Res	66	55	56	0
	B-135	6138 KENDRA WAY, Row 3 Flr1	1	B	Res	66	40	42	0
	B-136	14095 ASHER VW, Row 3 Flr1	1	B	Res	66	48	49	0
	B-137	6121 KENDRA WAY, Row 1 Flr1	1	B	Res	66	51	52	0
	B-138	6140 KENDRA WAY, Row 1 Flr1	1	B	Res	66	40	41	0
	B-139	14095 ASHER VW, Row 1 Flr1	1	B	Res	66	48	49	0
	B-140	6123 KENDRA WAY, Row 1 Flr1	1	B	Res	66	52	53	0
	B-141	6125 KENDRA WAY, Row 1 Flr1	1	B	Res	66	52	54	0
	B-142	14091 ASHER VW, Row 1 Flr1	1	B	Res	66	48	49	0
	B-143	6127 KENDRA WAY, Row 1 Flr1	1	B	Res	66	53	54	0
	B-144	14091 ASHER VW, Row 1 Flr1	1	B	Res	66	48	50	0
	B-145	6129 KENDRA WAY, Row 1 Flr1	1	B	Res	66	53	55	0
	B-146	14087 ASHER VW, Row 1 Flr1	1	B	Res	66	48	49	0
	B-147	6131 KENDRA WAY, Row 1 Flr1	1	B	Res	66	53	55	0
	B-148	6146 KENDRA WAY, Row 1 Flr1	1	B	Res	66	41	43	0
	B-149	14087 ASHER VW, Row 1 Flr1	1	B	Res	66	48	50	0

TABLE 7
ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
	B-150	6133 KENDRA WAY, Row 1 Flr1	1	B	Res	66	53	54	0
	B-151	6146 KENDRA WAY, Row 1 Flr1	1	B	Res	66	52	53	0
	B-152	14085 ASHER VW, Row 2 Flr1	1	B	Res	66	55	57	0
	B-153	6137 KENDRA WAY, Row 2 Flr1	1	B	Res	66	53	54	0
	B-154	14083 ASHER VW, Row 1 Flr1	1	B	Res	66	54	56	0
	B-155	6137 KENDRA WAY, Row 2 Flr1	1	B	Res	66	53	54	0
	B-156	14081 ASHER VW, Row 1 Flr1	1	B	Res	66	49	50	0
	B-157	6139 KENDRA WAY, Row 2 Flr1	1	B	Res	66	54	55	0
	B-158	14079 ASHER VW, Row 1 Flr1	1	B	Res	66	50	51	0
	B-159	6141 KENDRA WAY, Row 1 Flr1	1	B	Res	66	55	56	0
	B-160	14077 ASHER VW, Row 1 Flr1	1	B	Res	66	50	51	0
	B-161	14075 ASHER VW, Row 1 Flr1	1	B	Res	66	51	52	0
	B-162	6143 KENDRA WAY, Row 1 Flr1	1	B	Res	66	57	57	0
	B-163	14073 ASHER VW, Row 2 Flr1	1	B	Res	66	52	53	0
	B-164	6145 KENDRA WAY, Row 3 Flr1	1	B	Res	66	58	58	0
	B-165	14071 ASHER VW, Row 1 Flr1	1	B	Res	66	53	54	0
	B-166	14069 ASHER VW, Row 1 Flr1	1	B	Res	66	56	57	0
CNE C	C-001	Willowcreek Academy Playground, 6100 REDWOOD SQUARE CTR, Row 1	1	C	Rec	66	68	71	64
CNE C	C-002	Willowcreek Academy Playground, 6100 REDWOOD SQUARE CTR, Row 1	1	C	Rec	66	62	65	60
CNE C	C-003	Willowcreek Academy Interior, 6100 REDWOOD SQUARE CTR, Row 1	1	D	Rec	51	68 (48)	70 (50)	64 (44)
CNE C	C-004	Willowcreek Academy Playground, 6100 REDWOOD SQUARE CTR, Row 1	1	C	Rec	66	69	70	64
CNE C	C-005	Willowcreek Academy Playground, 6100 REDWOOD SQUARE CTR, Row 1	1	C	Rec	66	62	64	59
CNE C	C-006	14026 ADOLPHUS DR, Row 2 Flr1	1	B	Res	66	54	56	0
CNE C	C-007	14024 ADOLPHUS DR, Row 2 Flr1	1	B	Res	66	51	53	0
CNE C	C-008	14022 ADOLPHUS DR, Row 2 Flr1	1	B	Res	66	53	55	0
CNE C	C-009	14020 ADOLPHUS DR, Row 2 Flr1	1	B	Res	66	53	55	0
CNE C	C-010	6100 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	47	50	0
CNE C	C-011	6100 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	53	55	0
CNE C	C-012	6100 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	55	56	0
CNE C	C-013	Hoskins Hollow Outdoor use, 6104 HOSKINS HOLLOW CIR, Row 2	1	C	Rec	66	52	53	0
CNE C	C-014	Hoskins Hollow Outdoor use, 6104 HOSKINS HOLLOW CIR, Row 2	1	C	Rec	66	51	52	0
CNE C	C-015	6104 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	53	55	0
CNE C	C-016	6104 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	55	57	0
CNE C	C-017	6104 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	53	53	0
CNE C	C-018	6106 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	55	57	0
CNE C	C-019	6106 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	51	52	0
CNE C	C-020	6108 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	52	53	0
CNE C	C-021	6108 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	56	57	0
CNE C	C-022	6108 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	51	52	0
CNE C	C-023	6108 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	53	54	0
CNE C	C-024	6110 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	51	52	0
CNE C	C-025	6110 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	57	58	0
CNE C	C-026	6110 HOSKINS HOLLOW CIR, Row 2 Flr1	1	B	Res	66	57	58	0
	D-002	Heritage Forest Tennis Courts, 14123 STARBIRD CT, Row 1	1	C	Rec	66	59	62	0
	D-003	Heritage Forest Tennis Courts, 14123 STARBIRD CT, Row 1	1	C	Rec	66	58	61	0
	D-004	Heritage Forest Tennis Courts, 14123 STARBIRD CT, Row 1	1	C	Rec	66	59	62	0
	D-005	Heritage Forest Tennis Courts, 14123 STARBIRD CT, Row 1	1	C	Rec	66	58	61	0
	D-006	14121 STARBIRD CT, Row 1 Flr1	1	B	Res	66	60	62	61
	D-007	14119 STARBIRD CT, Row 1 Flr1	1	B	Res	66	61	63	62
	D-008	14119 STARBIRD CT, Row 1 Flr1	1	B	Res	66	61	63	61
	D-009	14117 STARBIRD CT, Row 1 Flr1	1	B	Res	66	61	62	61
	D-010	14113 STARBIRD CT, Row 1 Flr1	1	B	Res	66	60	62	60
	D-011	14113 STARBIRD CT, Row 1 Flr1	1	B	Res	66	57	59	58
	D-012	14111 STARBIRD CT, Row 1 Flr1	1	B	Res	66	57	59	57
	D-013	6323 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	66	68	61
	D-014	6321 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	65	67	58
	D-015	6319 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	68	70	61
	D-016	14109 STARBIRD CT, Row 1 Flr1	1	B	Res	66	56	59	57
	D-017	6317 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	69	70	61
	D-018	6315 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	70	71	62
	D-019	6327 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	59	61	58
	D-020	6327 SAINT TIMOTHYS LN, Row 1 Flr1	1	B	Res	66	57	59	58
	D-021	14120 RED RIVER DR, Row 1 Flr1	1	B	Res	66	58	60	58
	D-022	14118 RED RIVER DR, Row 1 Flr1	1	B	Res	66	57	59	58
	D-023	14124 RED RIVER DR, Row 1 Flr1	1	B	Res	66	58	60	58
	D-024	14116 RED RIVER DR, Row 1 Flr1	1	B	Res	66	57	59	57
	D-025	14116 RED RIVER DR, Row 1 Flr1	1	B	Res	66	57	59	57
	D-026	6331 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	56	57	57
	D-027	6348 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	67	69	58
	D-028	6331 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	55	56	56
	D-029	6348 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	68	70	58
	D-030	6333 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	54	55	55
	D-031	6352 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	71	61
	D-032	6335 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	54	55	54
	D-033	6352 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	72	61
	D-034	14126 RED RIVER DR, Row 3 Flr1	1	B	Res	66	56	58	57
	D-035	6354 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	67	69	58
	D-036	14130 RED RIVER DR, Row 3 Flr1	1	B	Res	66	55	57	56
	D-037	14130 RED RIVER DR, Row 3 Flr1	1	B	Res	66	55	57	56
	D-038	6356 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	69	71	61
	D-039	14132 RED RIVER DR, Row 3 Flr1	1	B	Res	66	55	57	56
	D-040	6345 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	55	56	49
	D-041	6358 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	69	71	62
	D-042	6343 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	47	49	43
	D-043	6341 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	49	51	44
	D-044	6337 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	47	49	42
	D-045	6337 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	48	50	43
	D-046	14134 RED RIVER DR, Row 3 Flr1	1	B	Res	66	55	57	55
	D-047	6360 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	72	62

TABLE 7									
ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS									
CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
CNE D	D-048	6359 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	56	57	50
	D-049	6361 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	53	54	47
	D-050	6362 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	72	62
	D-051	6363 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	54	56	47
	D-052	14136 RED RIVER DR, Row 3 Flr1	1	B	Res	66	54	56	55
	D-053	6363 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	52	53	45
	D-054	6365 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	51	52	44
	D-055	6367 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	50	51	44
	D-056	6369 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	49	50	44
	D-057	6364 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	72	62
	D-058	6366 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	70	72	62
	D-059	14136 RED RIVER DR, Row 1 Flr1	1	B	Res	66	53	55	54
	D-060	6368 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	69	71	62
	D-061	14136 RED RIVER DR, Row 1 Flr1	1	B	Res	66	52	55	54
	D-062	6371 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	51	51	51
	D-063	6375 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	50	51	51
	D-064	6375 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	50	51	51
	D-065	6370 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	66	68	59
	D-066	6377 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	50	51	50
	D-067	6372 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	63	65	57
	D-068	6374 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	62	64	57
	D-069	6376 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	61	63	57
	D-070	6386 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	55	57	57
	D-071	6378 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	60	62	58
	D-072	6379 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	49	50	50
	D-073	6382 SAINT TIMOTHYS LN, Row 1Flr1	1	B	Res	66	60	61	58
	D-074	6386 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	58	60	57
	D-075	14219 DARKWOOD DR, Row 1 Flr1	1	B	Res	66	61	63	52
	D-076	6382 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	59	61	58
	D-077	6388 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	58	60	58
	D-078	6383 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	49	50	50
	D-079	6385 SAINT TIMOTHYS LN, Row 3Flr1	1	B	Res	66	49	50	50
	D-080	6390 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	59	61	59
	D-081	6392 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	59	61	59
	D-082	6396 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	59	62	60
	D-083	6396 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	60	62	60
	D-084	6398 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	60	62	60
	D-085	6400 SAINT TIMOTHYS LN, Row 2Flr1	1	B	Res	66	60	62	60
	D-086	14210 DARKWOOD DR, Row 1 Flr1	1	B	Res	66	70	72	65
	D-087	6438 LA PETITE PL, Row 4 Flr1	1	B	Res	66	59	61	60
	D-088	14208 DARKWOOD DR, Row 1 Flr1	1	B	Res	66	63	65	63
	D-089	14204 DARKWOOD DR, Row 5 Flr1	1	B	Res	66	56	59	57
	D-090	6438 LA PETITE PL, Row 4 Flr1	1	B	Res	66	52	54	54
	D-091	6440 LA PETITE PL, Row 3 Flr1	1	B	Res	66	57	59	59
	D-092	6444 LA PETITE PL, Row 1 Flr1	1	B	Res	66	50	51	50
	D-093	6442 LA PETITE PL, Row 2 Flr1	1	B	Res	66	57	59	58
	D-094	6446 LA PETITE PL, Row 1 Flr1	1	B	Res	66	61	63	61
	D-095	6440 LA PETITE PL, Row 4 Flr1	1	B	Res	66	50	52	52
	D-096	6442 LA PETITE PL, Row 4 Flr1	1	B	Res	66	51	54	54
	D-097	6448 LA PETITE PL, Row 1 Flr1	1	B	Res	66	59	61	61
	D-098	6450 LA PETITE PL, Row 1 Flr1	1	B	Res	66	60	63	62
	D-099	6449 LA PETITE PL, Row 3 Flr1	1	B	Res	66	52	55	54
	D-100	6449 LA PETITE PL, Row 2 Flr1	1	B	Res	66	54	57	57
CNE E	E-001	Centreville United Methodist Church, 6400 OLD CENTREVILLE RD, Row 1 Flr1	1	D	Int	51	56 (36)	59 (39)	0
	E-002	Centreville United Methodist Church, 6400 OLD CENTREVILLE RD, Row 1	1	C	Rec	66	59	61	0
	E-003	Centreville United Methodist Church, 6400 OLD CENTREVILLE RD, Row 1	1	C	Rec	66	57	59	0
	E-004	Montesori Childrens Center, 6319 OLD CENTREVILLE RD, Row 1	1	C	Rec	66	58	60	0
	E-005	Montesori Childrens Center, 6319 OLD CENTREVILLE RD, Row 1	1	C	Rec	66	59	61	0
	E-006	Montesori Childrens Center, 6319 OLD CENTREVILLE RD, Row 1 Flr1	1	D	Int	51	65 (45)	67 (47)	0
	E-007	6321 OLD CENTREVILLE RD, Row 1Flr1	1	B	Res	66	62	65	0
	E-008	6400 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	60	62	0
	E-009	6500 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	51	53	53
	E-010	6501 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	61	63	62
	E-011	6503 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	63	65	64
	E-012	6506 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	39	41	41
	E-013	6508 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	39	41	41
	E-014	6505 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	63	65	64
	E-015	6510 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	42	43	43
	E-016	6507 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	60	62	61
	E-017	6511 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	63	65	63
	E-018	6510 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	43	46	42
	E-019	6516 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	43	45	43
	E-020	6509 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	55	57	53
	E-021	6516 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	38	40	40
	E-022	6513 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	67	68	61
	E-023	6505 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	42	44	43
	E-024	6521 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	54	57	54
	E-025	6522 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	39	40	40
	E-026	6515 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	70	72	62
	E-027	6524 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	38	40	39
	E-028	6507 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	44	46	44
	E-029	6523 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	61	63	55
	E-030	6519 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	61	64	55
	E-031	6517 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	69	71	63
	E-032	6509 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	42	44	44
	E-033	6525 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	59	61	52
	E-034	6526 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	36	38	37
	E-035	6511 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	44	46	46
	E-036	6528 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	40	42	41

TABLE 7
ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
	E-037	6527 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	59	61	52
	E-038	14300 GRAINERY RD, Row 1 Flr1	1	B	Res	66	64	66	56
	E-039	6513 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	47	49	48
	E-040	6529 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	58	60	52
	E-041	6530 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	41	43	42
	E-042	6531 HARVEST MILL CT, Row 1 Flr1	1	B	Res	66	60	62	53
	E-043	6515 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	51	53	50
	E-044	6532 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	52	55	51
	E-045	14302 GRAINERY RD, Row 1 Flr1	1	B	Res	66	59	61	52
	E-046	6517 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	50	52	49
	E-047	14306 GRAINERY RD, Row 2 Flr1	1	B	Res	66	45	47	44
	E-048	6519 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	53	55	54
	E-049	6534 HARVEST MILL CT, Row 2 Flr1	1	B	Res	66	58	60	57
	E-050	14303 GRAINERY RD, Row 1 Flr1	1	B	Res	66	67	69	58
	E-051	14305 GRAINERY RD, Row 1 Flr1	1	B	Res	66	64	66	59
	E-052	Grainery Courts, 14305 GRAINERY RD, Row 1	1	C	Rec	66	61	63	59
	E-053	6526 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	39	41	39
	E-054	6528 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	43	44	44
	E-055	Grainery Courts, 14305 GRAINERY RD, Row 1	1	C	Rec	66	63	64	63
	E-056	6530 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	41	43	43
	E-057	6529 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	60	61	61
	E-058	6532 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	42	44	0
	E-059	6531 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	60	62	0
	E-060	6534 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	43	45	45
	E-061	6533 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	61	63	61
	E-062	6536 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	43	45	45
	E-063	6535 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	62	64	61
	E-064	6538 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	45	46	46
	E-065	6537 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	63	65	61
	E-066	6540 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	50	52	52
	E-067	6539 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	64	66	60
	E-068	6542 WHEAT MILL WAY, Row 2 Flr1	1	B	Res	66	54	55	55
	E-069	6541 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	65	66	60
	E-070	6543 WHEAT MILL WAY, Row 1 Flr1	1	B	Res	66	65	67	61
CNE F	F-001	6452 LA PETITE PL, Row 1 Flr1	1	B	Res	66	57	58	58
	F-002	6452 LA PETITE PL, Row 2 Flr1	1	B	Res	66	55	57	55
	F-003	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	63	65	59
	F-004	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	61	63	59
	F-005	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	63	65	59
	F-006	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	60	63	58
	F-007	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	59	61	58
	F-008	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	64	66	59
	F-009	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	61	63	59
	F-010	Centreville Elementary SchoolBaseball Field, 6409 CENTREVILLE RD, Row 1	1	C	Rec	66	59	60	58
	F-011	Centreville Elementary SchoolBaseball Field, 14303 GRAINERY RD, Row 1	1	C	Rec	66	59	60	58
	F-012	Centreville Elementary SchoolBaseball Field, 14303 GRAINERY RD, Row 1	1	C	Rec	66	61	63	60
	F-013	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	58	60	57
	F-014	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	61	62	60
	F-015	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	58	59	57
	F-016	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	60	62	61
	F-017	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	56	58	56
	F-018	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	57	59	58
	F-019	Centreville Elementary SchoolBaseball Field, 14330 GREEN TRAILS BLVD, Row 1	1	C	Rec	66	62	64	64
	F-020	Centreville Elementary SchoolPlayground, 14330 GREEN TRAILS	1	C	Rec	66	60	63	62
	F-021	Centreville Elementary SchoolInterior, 14330 GREEN TRAILS BLVD, Row 1 Flr1	1	D	Int	51	63 (43)	66 (46)	66 (46)
CNE G	G-001	14342 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	57	57	57
	G-002	14350 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	59	61	59
	G-003	14344 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	57	58	57
	G-004	14352 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	63	66	59
	G-005	14346 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	57	59	57
	G-006	14348 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	54	57	56
	G-007	14354 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	62	65	59
	G-008	14345 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	52	54	53
	G-009	14356 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	56	58	56
	G-010	14355 COMPTON VILLAGE DR, Row1 Flr1	1	B	Res	66	53	55	54
	H-001	6723 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	57	59	59
	H-002	6725 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	57	57
	H-003	6727 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	57
	H-004	6729 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	56	56
	H-005	6731 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	55	55
	H-006	6733 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	55	55
	H-007	6735 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	52	54	54
	H-008	6737 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	57	57
	H-009	6737 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	57	57
	H-010	6790 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	57	57
	H-011	6792 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	56
	H-012	6794 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	56
	H-013	6796 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	56	55
	H-014	6798 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	56	55
	H-015	6800 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	56	55
	H-016	6802 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	55
	H-017	6804 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	56	55
	H-018	Compton Village Tennis Court 1	1	C	Rec	66	65	70	64
	H-019	6851 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	55
	H-020	6793 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	44	46	45
	H-021	Compton Village Tennis Court 1C Rec	1	C	Res	66	66	71	64
	H-022	6797 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	44
	H-023	6799 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	44
	H-024	6803 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	46	45

TABLE 7

ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
CNE H	H-025	6805 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	45
	H-026	6809 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	45
	H-027	6821 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	46	45
	H-028	6823 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	42	45	44
	H-029	6849 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	58	61	59
	H-030	6827 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	42	44	43
	H-031	6847 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	56	59	57
	H-032	6827 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	44
	H-033	6845 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	58	56
	H-034	6843 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	54	57	55
	H-035	6831 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	43	45	44
	H-036	6841 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	56	54
	H-037	6831 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	44	47	46
	H-038	6839 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	56	53
	H-039	6853 MALABAR CT, Row 1 Flr1	1	B	Res	66	58	60	58
	H-040	6833 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	47	50	49
	H-041	6837 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	55	58	56
	H-042	6853 MALABAR CT, Row 1 Flr1	1	B	Res	66	57	59	56
	H-043	6835 STONE MAPLE TER, Row 2 Flr1	1	B	Res	66	48	50	50
	H-044	6855 MALABAR CT, Row 1 Flr1	1	B	Res	66	55	58	55
	H-045	6837 STONE MAPLE TER, Row 1 Flr1	1	B	Res	66	53	55	54
	H-046	6857 MALABAR CT, Row 1 Flr1	1	B	Res	66	55	58	54
	H-047	6859 MALABAR CT, Row 1 Flr1	1	B	Res	66	53	56	52
	H-048	14308 MONTVERD CT, Row 2 Flr1	1	B	Res	66	47	49	48
	H-049	14310 MONTVERD CT, Row 2 Flr1	1	B	Res	66	48	50	49
	H-050	14312 MONTVERD CT, Row 2 Flr1	1	B	Res	66	49	52	50
	H-051	14314 MONTVERD CT, Row 2 Flr1	1	B	Res	66	52	54	53
	H-052	14316 MONTVERD CT, Row 2 Flr1	1	B	Res	66	52	54	0
	H-053	6861 MALABAR CT, Row 1 Flr1	1	B	Res	66	44	47	0
	H-054	14318 MONTVERD CT, Row 2 Flr1	1	B	Res	66	48	51	0
	H-055	6863 MALABAR CT, Row 1 Flr1	1	B	Res	66	45	47	0
	H-056	14320 MONTVERD CT, Row 2 Flr1	1	B	Res	66	50	53	0
	H-057	6865 MALABAR CT, Row 1 Flr1	1	B	Res	66	46	48	0
	H-058	6867 MALABAR CT, Row 1 Flr1	1	B	Res	66	50	52	0
	H-059	14322 MONTVERD CT, Row 2 Flr1	1	B	Res	66	52	54	0
	H-060	14324 MONTVERD CT, Row 2 Flr1	1	B	Res	66	52	54	0
	H-061	6869 MALABAR CT, Row 1 Flr1	1	B	Res	66	55	57	0
	H-062	14326 MONTVERD CT, Row 2 Flr1	1	B	Res	66	53	55	0
	H-063	14331 FLOMATION CT, Row 2 Flr1	1	B	Res	66	56	58	0
	H-064	6901 DESTIN CT, Row 1 Flr1	1	B	Res	66	53	55	0
	H-065	14329 FLOMATION CT, Row 2 Flr1	1	B	Res	66	53	56	0
	H-066	6903 DESTIN CT, Row 1 Flr1	1	B	Res	66	45	48	0
	H-067	6905 DESTIN CT, Row 1 Flr1	1	B	Res	66	44	47	0
	H-068	14327 FLOMATION CT, Row 2 Flr1	1	B	Res	66	52	54	0
	H-069	6907 DESTIN CT, Row 1 Flr1	1	B	Res	66	46	49	0
	H-070	14325 FLOMATION CT, Row 2 Flr1	1	B	Res	66	50	53	0
	H-071	6909 DESTIN CT, Row 1 Flr1	1	B	Res	66	52	56	0
	H-072	Compton Village Tennis Court,14401 COMPTON VILLAGE DR, Row 1	1	C	Rec	66	61	65	0
	H-073	14323 FLOMATION CT, Row 2 Flr1	1	B	Res	66	50	54	0
	H-074	14321 FLOMATION CT, Row 2 Flr1	1	B	Res	66	50	54	0
	H-075	Compton Village Tennis Court,14401 COMPTON VILLAGE DR, Row 1	1	C	Rec	66	59	64	0
	H-076	Compton Village Tennis Court,14401 COMPTON VILLAGE DR, Row 1	1	C	Rec	66	49	53	0
	H-077	Compton Village Tennis Court,14401 COMPTON VILLAGE DR, Row 1	1	C	Rec	66	51	55	0
	I-001	14400 NICHOLAS SCHAR WAY, Row1 Flr1	1	B	Res	66	56	57	0
	I-002	14401 NICHOLAS SCHAR WAY, Row1 Flr1	1	B	Res	66	58	59	0
	I-003	14400 TRACY SCHAR LN, Row 1 Flr1	1	B	Res	66	58	59	0
	I-004	14401 TRACY SCHAR LN, Row 1 Flr1	1	B	Res	66	54	57	0
	I-005	14401 TRACY SCHAR LN, Row 1 Flr1	1	B	Res	66	55	57	0
	I-006	6724 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	57	58	0
	I-007	6708 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	54	56	0
	I-008	6706 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	55	57	0
	I-009	6704 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	57	58	0
	I-010	6702 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	59	60	0
	I-011	6707 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	53	54	0
	I-012	6705 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	54	56	0
	I-013	6703 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	55	57	0
	I-014	6757 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	52	54	0
	I-015	6701 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	58	59	0
	I-016	6759 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	54	55	0
	I-017	6761 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	55	56	0
	I-018	6763 ROCKLEDGE PL, Row 1 Flr1	1	B	Res	66	56	58	0
	I-019	6802 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	61	61	0
	I-020	6712 SCOTT TER, Row 1 Flr1	1	B	Res	66	55	58	0
	I-021	6712 SCOTT TER, Row 1 Flr1	1	B	Res	66	56	59	0
	I-022	6714 SCOTT TER, Row 1 Flr1	1	B	Res	66	54	57	0
	I-023	6716 SCOTT TER, Row 1 Flr1	1	B	Res	66	55	58	0
	I-024	6718 SCOTT TER, Row 1 Flr1	1	B	Res	66	56	59	0
	I-025	6720 SCOTT TER, Row 1 Flr1	1	B	Res	66	57	60	0
	I-026	6722 SCOTT TER, Row 1 Flr1	1	B	Res	66	58	61	0
	I-027	14512 CHELSEY PL, Row 2 Flr1	1	B	Res	66	54	56	0
	I-028	6724 SCOTT TER, Row 1 Flr1	1	B	Res	66	60	62	0
	I-029	14512 CHELSEY PL, Row 2 Flr1	1	B	Res	66	45	46	0
	I-030	14508 CHELSEY PL, Row 1 Flr1	1	B	Res	66	60	62	0
	I-031	14506 CHELSEY PL, Row 1 Flr1	1	B	Res	66	61	63	0
	I-032	14504 CHELSEY PL, Row 1 Flr1	1	B	Res	66	62	64	0
	I-033	14502 CHELSEY PL, Row 1 Flr1	1	B	Res	66	62	64	0
	I-034	14500 CHELSEY PL, Row 1 Flr1	1	B	Res	66	63	65	0
	I-035	14509 STILSBY CT, Row 2 Flr1	1	B	Res	66	46	48	0
	I-036	14509 CHELSEY PL, Row 1 Flr1	1	B	Res	66	48	49	0

TABLE 7

ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
CNE I	I-037	14509 STILSBY CT, Row 2 Flr1	1	B	Res	66	47	50	0
	I-038	14507 STILSBY CT, Row 2 Flr1	1	B	Res	66	48	51	0
	I-039	14507 CHELSEY PL, Row 1 Flr1	1	B	Res	66	49	50	0
	I-040	14505 STILSBY CT, Row 2 Flr1	1	B	Res	66	50	53	0
	I-041	14505 CHELSEY PL, Row 1 Flr1	1	B	Res	66	52	52	0
	I-042	14503 STILSBY CT, Row 2 Flr1	1	B	Res	66	52	55	0
	I-043	14503 CHELSEY PL, Row 1 Flr1	1	B	Res	66	54	55	0
	I-044	14503 CHELSEY PL, Row 1 Flr1	1	B	Res	66	58	60	0
	I-045	14503 STILSBY CT, Row 2 Flr1	1	B	Res	66	55	57	0
	I-046	6801 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	62	66	61
	I-047	6803 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	63	66	61
	I-048	6800 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	58	59	59
	I-049	6802 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	57	58	58
	I-050	6805 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	67	69	62
	I-051	6804 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	56	57	57
	I-052	6806 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	57	57	57
	I-053	6807 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	67	69	62
	I-054	6808 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	56	57	57
	I-055	6810 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	56	57	57
	I-056	6809 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	64	67	60
	I-057	6812 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	56	57	56
	I-058	6811 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	64	67	59
	I-059	6813 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	65	67	59
	I-060	6815 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	63	67	58
	I-061	6817 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	63	67	57
	I-062	6819 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	62	66	57
	I-063	6821 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	63	66	57
	I-064	6851 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	54	55	53
	I-065	6823 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	68	70	58
	I-066	6849 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	52	55	51
	I-067	6847 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	52	54	50
	I-068	6845 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	53	56	50
	I-069	6825 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	68	70	58
	I-070	6843 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	52	56	49
	I-071	14501 SKIPTON CT, Row 2 Flr1	1	B	Res	66	52	53	52
	I-072	6841 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	53	56	49
	I-073	14503 SKIPTON CT, Row 2 Flr1	1	B	Res	66	50	52	50
	I-074	6839 COTTINGHAM LN, Row 2 Flr1	1	B	Res	66	55	58	50
	I-075	14505 SKIPTON CT, Row 2 Flr1	1	B	Res	66	49	51	49
	I-076	14507 SKIPTON CT, Row 2 Flr1	1	B	Res	66	48	51	48
	I-077	6837 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	59	61	52
	I-078	14507 SKIPTON CT, Row 2 Flr1	1	B	Res	66	50	53	50
	I-079	6835 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	62	64	55
	I-080	6833 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	63	65	57
	I-081	14511 SKIPTON CT, Row 2 Flr1	1	B	Res	66	49	53	48
	I-082	6831 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	64	66	57
	I-083	14513 SKIPTON CT, Row 2 Flr1	1	B	Res	66	50	54	48
	I-084	6829 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	65	67	58
	I-085	14515 SKIPTON CT, Row 1 Flr1	1	B	Res	66	51	56	49
	I-086	6827 COTTINGHAM LN, Row 1 Flr1	1	B	Res	66	67	69	60
	I-087	14517 SKIPTON CT, Row 1 Flr1	1	B	Res	66	54	58	50
	I-088	14519 SKIPTON CT, Row 1 Flr1	1	B	Res	66	58	63	55
	I-089	14523 SKIPTON CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-090	14523 SKIPTON CT, Row 1 Flr1	1	B	Res	66	63	67	59
	I-091	14525 SKIPTON CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-092	14527 SKIPTON CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-093	14527 SKIPTON CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-094	14545 SKIPTON CT, Row 1 Flr1	1	B	Res	66	56	58	55
	I-095	14543 SKIPTON CT, Row 1 Flr1	1	B	Res	66	56	58	53
	I-096	14541 SKIPTON CT, Row 1 Flr1	1	B	Res	66	56	58	52
	I-097	14539 SKIPTON CT, Row 1 Flr1	1	B	Res	66	57	59	51
	I-098	14537 SKIPTON CT, Row 1 Flr1	1	B	Res	66	59	60	52
	I-099	14535 SKIPTON CT, Row 1 Flr1	1	B	Res	66	60	62	52
	I-100	14533 SKIPTON CT, Row 1 Flr1	1	B	Res	66	61	63	54
	I-101	14545 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	54	55	53
	I-102	14531 SKIPTON CT, Row 1 Flr1	1	B	Res	66	64	66	58
	I-103	14543 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	54	55	51
	I-104	14541 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	54	56	50
	I-105	14539 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	55	57	51
	I-106	14537 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	56	58	51
	I-107	14535 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	57	60	53
	I-108	14533 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	58	61	54
	I-109	14531 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	59	62	55
	I-110	14529 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	63	65	57
	I-111	14527 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	62	66	58
	I-112	14540 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	55	56	54
	I-113	14523 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	63	66	58
	I-114	14538 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	55	56	54
	I-115	14536 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	56	57	55
	I-116	14523 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-117	14534 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	56	58	56
	I-118	14532 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	58	60	56
	I-119	14500 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	54	55	54
	I-120	14519 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	63	66	59
	I-121	14502 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	52	53	50
	I-122	14504 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	51	52	49
	I-123	14519 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	59
	I-124	14506 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	52	54	51
	I-125	14517 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	60

TABLE 7

ROUTE 28 EXISTING AND FUTURE PREDICTED NOISE LEVELS

CNE	Receptor ID	Address	# of Dwelling Units	Activity Category	Land Use	NAC	Loudest-hour Noise Levels (Leq(h) in dBA)		
							2016 Existing	2040 Build	2040 Mitigation
	I-126	14508 CASTLEFORD CT, Row 2 Flr1	1	B	Res	66	56	57	56
	I-127	14513 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	60
	I-128	14513 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	65	67	61
	I-129	14511 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	65	67	61
	I-130	14509 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	65	67	62
	I-131	14507 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	65	67	63
	I-132	14505 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	63
	I-133	14503 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	64
	I-134	14501 CASTLEFORD CT, Row 1 Flr1	1	B	Res	66	64	67	64
CNE J	J-001	14508 PITTMAN CT, Row 1 Flr1	1	B	Res	66	67	71	60
	J-002	14506 PITTMAN CT, Row 1 Flr1	1	B	Res	66	65	68	60
	J-003	14504 PITTMAN CT, Row 1 Flr1	1	B	Res	66	64	67	60
	J-004	14502 PITTMAN CT, Row 1 Flr1	1	B	Res	66	62	66	61
	J-005	14500 PITTMAN CT, Row 1 Flr1	1	B	Res	66	62	65	60
	J-006	14498 PITTMAN CT, Row 1 Flr1	1	B	Res	66	61	64	60
	J-007	14494 PITTMAN CT, Row 2 Flr1	1	B	Res	66	56	58	55
	J-008	14492 PITTMAN CT, Row 2 Flr1	1	B	Res	66	59	61	59
	J-009	14490 PITTMAN CT, Row 2 Flr1	1	B	Res	66	58	61	59
	J-010	14488 PITTMAN CT, Row 2 Flr1	1	B	Res	66	58	60	59
	J-011	14486 PITTMAN CT, Row 2 Flr1	1	B	Res	66	54	56	55
	J-012	14515 PITTMAN CT, Row 1 Flr1	1	B	Res	66	48	50	48
	J-013	14517 PITTMAN CT, Row 1 Flr1	1	B	Res	66	49	51	50
	J-014	14535 PITTMAN CT, Row 2 Flr1	1	B	Res	66	57	60	55
	J-015	14519 PITTMAN CT, Row 1 Flr1	1	B	Res	66	52	54	50
	J-016	14533 PITTMAN CT, Row 2 Flr1	1	B	Res	66	57	59	55
	J-017	14521 PITTMAN CT, Row 1 Flr1	1	B	Res	66	61	63	53
	J-018	14531 PITTMAN CT, Row 2 Flr1	1	B	Res	66	58	60	56
	J-019	14529 PITTMAN CT, Row 2 Flr1	1	B	Res	66	59	61	57
	J-020	14529 PITTMAN CT, Row 2 Flr1	1	B	Res	66	59	62	58
	J-021	14524 PITTMAN CT, Row 1 Flr1	1	B	Res	66	69	71	62
	J-022	14524 PITTMAN CT, Row 1 Flr1	1	B	Res	66	68	70	62
	J-023	14526 PITTMAN CT, Row 1 Flr1	1	B	Res	66	67	69	63
	J-024	14528 PITTMAN CT, Row 1 Flr1	1	B	Res	66	67	68	63
	J-025	14530 PITTMAN CT, Row 1 Flr1	1	B	Res	66	66	68	63
	J-026	14534 PITTMAN CT, Row 2 Flr1	1	B	Res	66	63	65	63
	J-027	14536 PITTMAN CT, Row 2 Flr1	1	B	Res	66	63	64	62
	J-028	14538 PITTMAN CT, Row 2 Flr1	1	B	Res	66	62	64	62
	J-029	14540 PITTMAN CT, Row 2 Flr1	1	B	Res	66	62	64	62
	J-030	14542 PITTMAN CT, Row 2 Flr1	1	B	Res	66	61	63	62
	J-031	14544 PITTMAN CT, Row 2 Flr1	1	B	Res	66	61	63	61
	J-032	6850 DRIFTON CT, Row 3 Flr1	1	B	Res	66	60	62	61
	J-033	6852 DRIFTON CT, Row 3 Flr1	1	B	Res	66	59	61	61
	J-034	6854 DRIFTON CT, Row 3 Flr1	1	B	Res	66	59	61	60
CNE K	K-001	7010 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	61	61	0
	K-002	7015 ORDWAY RD, Row 2 Flr1	1	B	Res	66	59	61	0
	K-003	7014 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	62	62	0
	K-004	7017 ORDWAY RD, Row 2 Flr1	1	B	Res	66	59	60	0
	K-005	7101 ORDWAY RD, Row 2 Flr1	1	B	Res	66	57	59	0
	K-006	7018 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	59	61	0
	K-007	7018 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	60	60	0
	K-008	7105 ORDWAY RD, Row 2 Flr1	1	B	Res	66	57	58	0
	K-009	7100 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	62	62	0
	K-010	7105 ORDWAY RD, Row 2 Flr1	1	B	Res	66	55	57	0
	K-011	7102 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	64	63	0
	K-012	7104 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	68	68	60
	K-013	7106 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	61	61	60
	K-014	7114 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	57	58	0
	K-015	7118 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	62	63	0
CNE L	L-001	7101 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	52	55	0
	L-002	7103 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	57	60	0
	L-003	7109 CENTREVILLE RD, Row 2 Flr1	1	B	Res	66	54	57	0
	L-004	7105 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	56	58	0
	L-005	7117 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	64	66	60
	L-006	7123 CENTREVILLE RD, Row 2 Flr1	1	B	Res	66	58	59	55
	L-007	7123 CENTREVILLE RD, Row 1 Flr1	1	B	Res	66	59	60	59

TABLE 11					
CNE C- WALL C1 OPTIMIZED BARRIER RESULTS					
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA			
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)	
Wall C1					
C-001	1	71	64	7	
C-002	1	65	60	4	
C-003	1	70 (50)	64 (44)	6	
C-004	1	70	64	6	
C-005	1	64	59	6	
*	Insertion Loss (IL) sound levels may be different due to rounding				
66	Indicates noise impact (NAC only)				
5	Indicates at least a 5 dBA benefit				

TABLE 12				
CNE D- WALL D1 OPTIMIZED BARRIER RESULTS				
Receptor ID	**# of Dwelling /Recreational Units**	**2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA**		
		No Barrier	**With Barrier (dBA)**	**Insertion Loss (IL)* (dBA)**
Wall D1				
D-006	1	62	61	1
D-007	1	63	62	1
D-008	1	63	61	1
D-009	1	62	61	2
D-010	1	62	60	2
D-011	1	59	58	2
D-012	1	59	57	2
D-013	1	68	61	8
D-014	1	67	58	9
D-015	1	70	61	9
D-016	1	59	57	2
D-017	1	70	61	10
D-018	1	71	62	9
D-019	1	61	58	3
D-020	1	59	58	1
D-021	1	60	58	2
D-022	1	59	58	2
D-023	1	60	58	2
D-024	1	59	57	2
D-025	1	59	57	2
D-026	1	57	57	0
D-027	1	69	58	11
D-028	1	56	56	0
D-029	1	70	58	11
D-030	1	55	55	0
D-031	1	71	61	10
D-032	1	55	54	0
D-033	1	72	61	10
D-034	1	58	57	1
D-035	1	69	58	11
D-036	1	57	56	1
D-037	1	57	56	1
D-038	1	71	61	10
D-039	1	57	56	1
D-040	1	56	49	8
D-041	1	71	62	10
D-042	1	49	43	6
D-043	1	51	44	7
D-044	1	49	42	7
D-045	1	50	43	7
D-046	1	57	55	1
D-047	1	72	62	10
D-048	1	57	50	8
D-049	1	54	47	7
D-050	1	72	62	9
D-051	1	56	47	9
D-052	1	56	55	1
D-053	1	53	45	8
D-054	1	52	44	8
D-055	1	51	44	8
D-056	1	50	44	7
D-057	1	72	62	9

TABLE 12				
CNE D- WALL D1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall D1				
D-058	1	72	62	10
D-059	1	55	54	1
D-060	1	71	62	9
D-061	1	55	54	1
D-062	1	51	51	0
D-063	1	51	51	0
D-064	1	51	51	0
D-065	1	68	59	9
D-066	1	51	50	0
D-067	1	65	57	8
D-068	1	64	57	7
D-069	1	63	57	6
D-070	1	57	57	0
D-071	1	62	58	5
D-072	1	50	50	0
D-073	1	61	58	3
D-074	1	60	57	2
D-075	1	63	52	11
D-076	1	61	58	3
D-077	1	60	58	3
D-078	1	50	50	0
D-079	1	50	50	0
D-080	1	61	59	2
D-081	1	61	59	2
D-082	1	62	60	2
D-083	1	62	60	2
D-084	1	62	60	2
D-085	1	62	60	1
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 13				
CNE D- WALL D2 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall D2				
D-086	1	72	65	7
D-087	1	61	60	1
D-088	1	65	63	3
D-089	1	59	57	1
D-090	1	54	54	1
D-091	1	59	59	1
D-092	1	51	50	1
D-093	1	59	58	1
D-094	1	63	61	2
D-095	1	52	52	0
D-096	1	54	54	0
D-097	1	61	61	0
D-098	1	63	62	0
D-099	1	55	54	0
D-100	1	57	57	0
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 14				
CNE E- WALL E1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall E1				
E-009	1	53	53	0
E-010	1	63	62	1
E-011	1	65	64	1
E-012	1	41	41	0
E-013	1	41	41	0
E-014	1	65	64	1
E-015	1	43	43	1
E-016	1	62	61	2
E-017	1	65	63	2
E-018	1	46	42	4
E-019	1	45	43	2
E-020	1	57	53	4
E-021	1	40	40	0
E-022	1	68	61	7
E-023	1	44	43	1
E-024	1	57	54	3
E-025	1	40	40	1
E-026	1	72	62	9
E-027	1	40	39	1
E-028	1	46	44	2
E-029	1	63	55	9
E-030	1	64	55	9
E-031	1	71	63	8
E-032	1	44	44	0
E-033	1	61	52	9
E-034	1	38	37	1
E-035	1	46	46	0
E-036	1	42	41	1
E-037	1	61	52	9
E-038	1	66	56	10
E-039	1	49	48	2
E-040	1	60	52	8
E-041	1	43	42	1
E-042	1	62	53	9
E-043	1	53	50	3
E-044	1	55	51	4
E-045	1	61	52	10
E-046	1	52	49	3
E-047	1	47	44	3
E-048	1	55	54	1
E-049	1	60	57	4
E-050	1	69	58	11

TABLE 14				
CNE E- WALL E1 OPTIMIZED BARRIER RESULTS				
Receptor ID	**# of Dwelling /Recreational Units**	**2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA**		
		No Barrier	**With Barrier (dBA)**	**Insertion Loss (IL)* (dBA)**
Wall E1				
E-051	1	66	59	7
E-052	1	63	59	3
E-053	1	41	39	1
E-054	1	44	44	0
E-055	1	64	63	1
E-056	1	43	43	0
E-057	1	61	61	0
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 15				
CNE E- WALL E2 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall E2				
E-060	1	45	45	0
E-061	1	63	61	2
E-062	1	45	45	0
E-063	1	64	61	3
E-064	1	46	46	0
E-065	1	65	61	5
E-066	1	52	52	0
E-067	1	66	60	6
E-068	1	55	55	0
E-069	1	66	60	7
E-070	1	67	61	6
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 16				
CNE F- WALL F1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall F1				
F-001	1	58	58	1
F-002	1	57	55	2
F-003	1	65	59	6
F-004	1	63	59	4
F-005	1	65	59	7
F-006	1	63	58	4
F-007	1	61	58	3
F-008	1	66	59	7
F-009	1	63	59	4
F-010	1	60	58	3
F-011	1	60	58	2
F-012	1	63	60	2
F-013	1	60	57	2
F-014	1	62	60	2
F-015	1	59	57	2
F-016	1	62	61	2
F-017	1	58	56	2
F-018	1	59	58	1
F-019	1	64	64	1
F-020	1	63	62	1
F-021	1	66 (46)	66 (46)	0
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 17				
CNE G- WALL G1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall G1				
G-001	1	57	57	1
G-002	1	61	59	2
G-003	1	58	57	1
G-004	1	66	59	7
G-005	1	59	57	1
G-006	1	57	56	1
G-007	1	65	59	6
G-008	1	54	53	1
G-009	1	58	56	2
G-010	1	55	54	2
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 18				
CNE H- WALL H1 OPTIMIZED BARRIER RESULTS				
Receptor ID	**# of Dwelling /Recreational Units**	**2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA**		
		No Barrier	**With Barrier (dBA)**	**Insertion Loss (IL)* (dBA)**
Wall H1				
H-001	1	59	59	0
H-002	1	57	57	0
H-003	1	57	57	0
H-004	1	56	56	0
H-005	1	55	55	0
H-006	1	55	55	0
H-007	1	54	54	0
H-008	1	57	57	0
H-009	1	57	57	0
H-010	1	57	57	1
H-011	1	57	56	1
H-012	1	57	56	1
H-013	1	56	55	1
H-014	1	56	55	1
H-015	1	56	55	1
H-016	1	57	55	1
H-017	1	56	55	1
H-018	1	70	64	7
H-019	1	57	55	1
H-020	1	46	45	1
H-021	1	71	64	7
H-022	1	45	44	1
H-023	1	45	44	1
H-024	1	46	45	1
H-025	1	45	45	1
H-026	1	45	45	1
H-027	1	46	45	0
H-028	1	45	44	1
H-029	1	61	59	2
H-030	1	44	43	1
H-031	1	59	57	2
H-032	1	45	44	1
H-033	1	58	56	2
H-034	1	57	55	2
H-035	1	45	44	1
H-036	1	56	54	2
H-037	1	47	46	1
H-038	1	56	53	2
H-039	1	60	58	2
H-040	1	50	49	0

TABLE 18				
CNE H- WALL H1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall H1				
H-041	1	58	56	2
H-042	1	59	56	3
H-043	1	50	50	0
H-044	1	58	55	3
H-045	1	55	54	2
H-046	1	58	54	4
H-047	1	56	52	3
H-048	1	49	48	1
H-049	1	50	49	2
H-050	1	52	50	2
H-051	1	54	53	1
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 19				
CNE I- WALL I1 and I2 OPTIMIZED BARRIER RESULTS				
Receptor ID	**# of Dwelling /Recreational Units**	**2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA**		
		No Barrier	**With Barrier (dBA)**	**Insertion Loss (IL)* (dBA)**
Wall I1 and I2				
I-046	1	66	61	5
I-047	1	66	61	6
I-048	1	59	59	0
I-049	1	58	58	0
I-050	1	69	62	7
I-051	1	57	57	0
I-052	1	57	57	0
I-053	1	69	62	7
I-054	1	57	57	0
I-055	1	57	57	0
I-056	1	67	60	7
I-057	1	57	56	0
I-058	1	67	59	8
I-059	1	67	59	8
I-060	1	67	58	9
I-061	1	67	57	9
I-062	1	66	57	9
I-063	1	66	57	9
I-064	1	55	53	2
I-065	1	70	58	11
I-066	1	55	51	4
I-067	1	54	50	5
I-068	1	56	50	6
I-069	1	70	58	12
I-070	1	56	49	7
I-071	1	53	52	1
I-072	1	56	49	8
I-073	1	52	50	2
I-074	1	58	50	8
I-075	1	51	49	2
I-076	1	51	48	3
I-077	1	61	52	9
I-078	1	53	50	3
I-079	1	64	55	9
I-080	1	65	57	8
I-081	1	53	48	5
I-082	1	66	57	8
I-083	1	54	48	6
I-084	1	67	58	9
I-085	1	56	49	7
I-086	1	69	60	9
I-087	1	58	50	8
I-088	1	63	55	8
I-089	1	66	59	8
I-090	1	67	59	7
I-091	1	66	59	7
I-092	1	66	59	7
I-093	1	66	59	7
I-094	1	58	55	3
I-095	1	58	53	5
I-096	1	58	52	7
I-097	1	59	51	8

TABLE 19				
CNE I- WALL I1 and I2 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall I1 and I2				
I-098	1	60	52	9
I-099	1	62	52	9
I-100	1	63	54	10
I-101	1	55	53	3
I-102	1	66	58	8
I-103	1	55	51	4
I-104	1	56	50	5
I-105	1	57	51	6
I-106	1	58	51	7
I-107	1	60	53	7
I-108	1	61	54	7
I-109	1	62	55	8
I-110	1	65	57	9
I-111	1	66	58	7
I-112	1	56	54	2
I-113	1	66	58	8
I-114	1	56	54	2
I-115	1	57	55	2
I-116	1	66	59	7
I-117	1	58	56	3
I-118	1	60	56	4
I-119	1	55	54	1
I-120	1	66	59	7
I-121	1	53	50	2
I-122	1	52	49	3
I-123	1	67	59	8
I-124	1	54	51	3
I-125	1	67	60	8
I-126	1	57	56	1
I-127	1	67	60	7
I-128	1	67	61	7
I-129	1	67	61	6
I-130	1	67	62	6
I-131	1	67	63	5
I-132	1	67	63	5
I-133	1	67	64	4
I-134	1	67	64	3
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 20				
CNE J- WALL J1 OPTIMIZED BARRIER RESULTS				
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA		
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)
Wall J1				
J-001	1	71	60	11
J-002	1	68	60	8
J-003	1	67	60	7
J-004	1	66	61	5
J-005	1	65	60	5
J-006	1	64	60	4
J-007	1	58	55	3
J-008	1	61	59	2
J-009	1	61	59	2
J-010	1	60	59	2
J-011	1	56	55	2
J-012	1	50	48	2
J-013	1	51	50	1
J-014	1	60	55	5
J-015	1	54	50	4
J-016	1	59	55	4
J-017	1	63	53	10
J-018	1	60	56	4
J-019	1	61	57	4
J-020	1	62	58	4
J-021	1	71	62	10
J-022	1	70	62	8
J-023	1	69	63	6
J-024	1	68	63	5
J-025	1	68	63	5
J-026	1	65	63	3
J-027	1	64	62	2
J-028	1	64	62	2
J-029	1	64	62	2
J-030	1	63	62	2
J-031	1	63	61	2
J-032	1	62	61	1
J-033	1	61	61	1
J-034	1	61	60	1
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			

TABLE 21					
CNE K- WALL K1 OPTIMIZED BARRIER RESULTS					
Receptor ID	# of Dwelling /Recreational Units	2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA			
		No Barrier	With Barrier (dBA)	Insertion Loss (IL)* (dBA)	
Wall K1					
K-012	1	68	60	8	
K-013	1	61	60	1	
*	Insertion Loss (IL) sound levels may be different due to rounding				
66	Indicates noise impact (NAC only)				
5	Indicates at least a 5 dBA benefit				

TABLE 22				
CNE L- WALL L1 and L2 OPTIMIZED BARRIER RESULTS				
Receptor ID	**# of Dwelling /Recreational Units**	**2040 Loudest Hour Predicted Future Noise Levels Leq(h) in dBA**		
		No Barrier	**With Barrier (dBA)**	**Insertion Loss (IL)* (dBA)**
WALL L1 and L2				
L-005	1	66	60	6
L-006	1	59	55	5
L-007	1	60	59	1
*	Insertion Loss (IL) sound levels may be different due to rounding			
66	Indicates noise impact (NAC only)			
5	Indicates at least a 5 dBA benefit			