COMMONWEALTH of VIRGINIA

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

Charles A. Kilpatrick, P.E.
Commissioner

January 9, 2018

To: File

From: T. Ross Hudnall

Subject: Route 639 – Ladysmith Road Widening
UPC: 106670
Project No: 0639-016-623, P101

The purpose of this memorandum is to summarize the results of the Preliminary Noise Analysis for the subject project. This analysis was completed in accordance with The State Noise Abatement Policy that was developed to implement the requirements of 23 Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2011), Federal Highway Administration's (FHWA's) Highway Traffic Noise Analysis and Abatement Policy and Guidance (December 2011), and the noise related requirements of The National Environmental Policy Act of 1969. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 and was updated on July 14, 2015.

VDOT is proposing to widen Route 639, Ladysmith Road, from two to four lanes for approximately 0.85 miles from the west end of the Route 639 bridge over I-95 at Exit 110 westward towards the intersection with U.S. Route 1. The project would include installation of traffic signals at two locations and the modification of the existing signal at the intersection of Route 1 and Route 639. Dual left turns in both directions will be constructed at each new signalized intersection. Additional through and turn lanes are to be provided at the intersection of Route 1 and Route 639. A raised median is to be constructed through the project corridor. Right-in and right-out-only access is to be provided at key locations. Project will also include pedestrian accommodations on both sides of Route 639 with sidewalks on one side and a shared use path on the other

Per the Federal noise regulations and State noise policy, due to the addition of through-traffic lanes, the project qualifies as a Type I project – a noise study is required. According to aerial imagery and through coordination with the Fredericksburg District the following noise sensitive sites were identified in the project corridor in the following Common Noise Environments (CNEs):

- **CNE A** contains one noise modeling site representing one single family residence located north of Route 639 and west of Route 1 which was evaluated under Activity Category B. This residence has direct driveway access to Route 639 and is located approximately 100 feet from the project.
- **CNE B** contains a total of four noise modeling sites representing two single family residences evaluated under Activity Category B, a school evaluated under Activity Category D, and a church evaluated under Activity Category D. CNE B is located south of Route 639 and west of Route 1. The school and the church have direct driveway access to Route 639 and Route 1 while the residences do not. The residences are located over 500 feet from Route 1 and over 450 feet from Route 639.
- **CNE C** contains a total of eight noise modeling sites representing eight single family residences which were evaluated under Activity Category B. All eight receptors in CNE C are located south of Route 639 and east of Route 1 and west of I-95. The residences range 25' to 450' in distance from Route 639 and Route 1.
- **CNE D** contains a total of seven modeling sites which represent two single family residences evaluated under Activity Category B, a daycare with playground evaluated under Activity Categories D and C respectively, a church evaluated under Activity Category D, and a restaurant outdoor dining area evaluated under Activity Category E.
- **CNE E** contains a total of three modeling sites representing three single family residences evaluated under Activity Category B located south of Route 639 and east of Route 1. Two of the three residences have direct driveway access to Route 639. The residences range 40' to 400' in distance from Route 1 and Route 639. One residence (modeling site E1) is a potential acquisition, therefore was not evaluated for design year noise levels.

The locations of the Common Noise Environments and noise modeling sites are shown in ***Figure 1.***

The noise analysis for the project was performed using a two dimensional Traffic Noise Model (TNM) due to the relatively flat terrain. ***Table 1*** summarizes the results from the analysis.

Since Environmental traffic Data (ENTRADA) was not developed for this project, the worst-case-hour traffic volumes were assumed to be 10% of the average daily traffic (ADT) volumes. ***Table 2*** summarizes the traffic used in the analysis.

The existing (2016) exterior noise levels in the project area are predicted to range from 45 to 69 dBA. The design year build (2043) exterior noise levels in the project area are predicted to range from 53 to 75 dBA.

Existing year (2016) noise levels are predicted to exceed the NAC for Activity Category B at four noise modeling sites representing four residences (Sites C3, D7, E1, and E2). Design year build (2043) noise levels are predicted to exceed the NAC for Activity Category B at eight noise

modeling sites representing eight residences (Sites A1, C1, C2, C3, C5, D6, D7, and E2). Site E1 was not modeled in the design year build scenario as the residence is considered to be a potential acquisition under the evaluated roadway design.

The indoor noise levels at the school, daycare, and two churches were evaluated under NAC Activity Category D. Since the exterior for these buildings 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 25 dBA (FHWA "Highway Traffic Noise Analysis and Abatement Policy and Guidance," December 2011). The indoor noise level for the school, daycare, and two churches are not predicted to exceed the NAC in the existing or design year build (2043) condition therefore are not considered to be impacted.

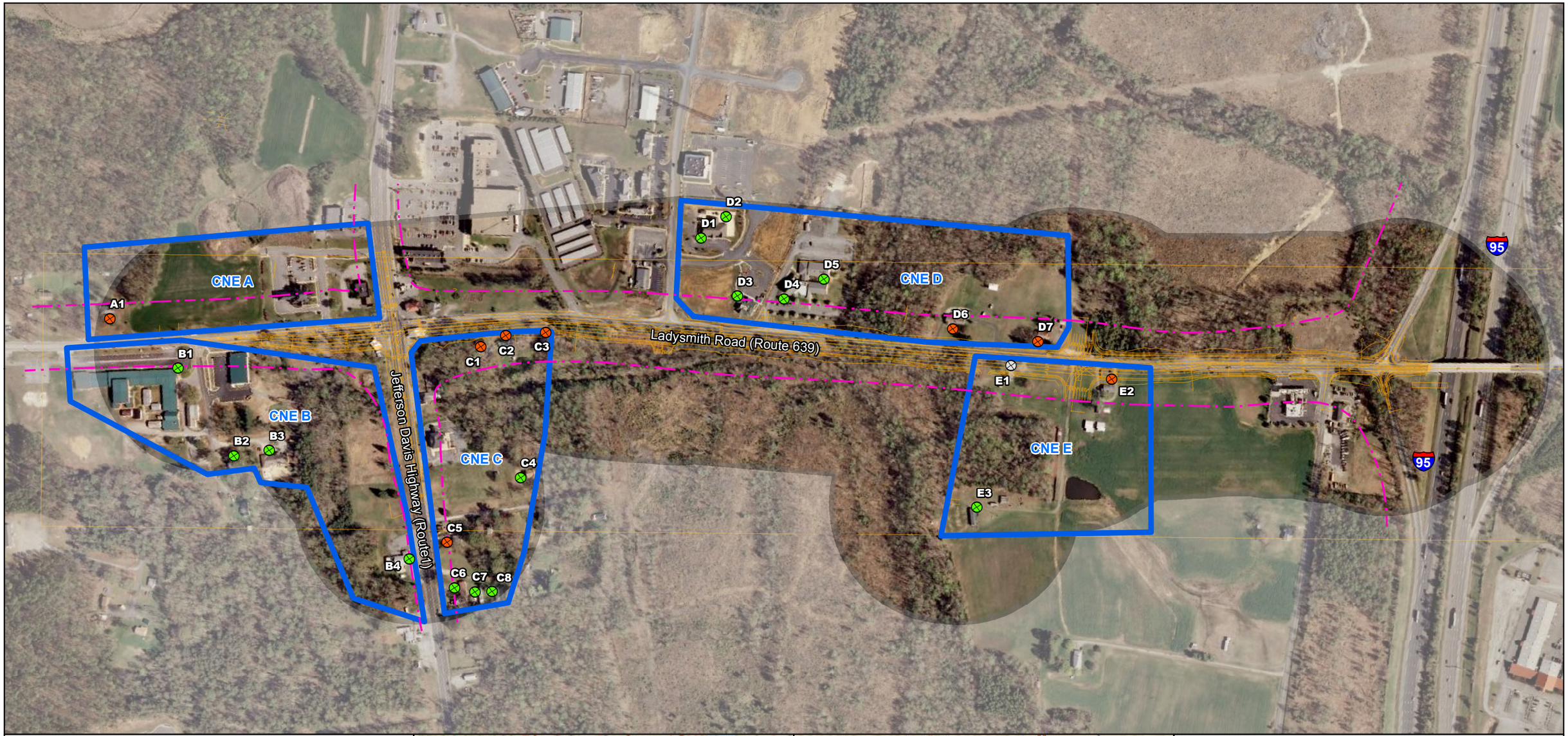
Although noise abatement for sites A1, C1, C2, C3, C5, D6, D7, and E2 is considered warranted for this project, it was determined that any potential noise barriers at each of these sites would not be feasible due to property access constraints. As a result, noise abatement is not considered feasible and is not recommended for this project.

In addition, correspondence with Caroline County on December 1st, 2017 confirmed that there are no undeveloped lands within the project corridor with active building permits.

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. The contractor will be required to conform to construction noise specifications found in VDOT's 2016 Road and Bridge Specifications, Section 107.16(b.3), "Noise."

In conclusion, the proposed project is predicted to create future noise impacts, however noise abatement is not considered feasible and noise barriers are not recommended for construction at this time. In addition, there are no highway traffic noise-related public controversies or substantial construction noise impacts associated with this project. Therefore a detailed quantitative noise analysis is not required.

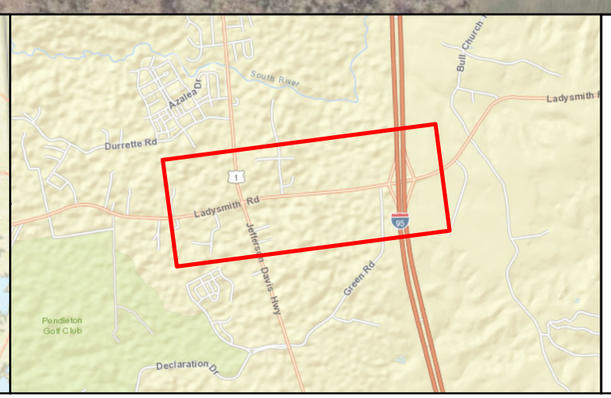
Feel free to contact the VDOT noise section with any questions.



- Not Impacted
- Impacted
- Potential Acquisition
- Common Noise Environment (CNE)
- 500' Noise Project Area
- 66dBA

0 500 1,000 Feet

N



LADYSMITH ROAD WIDENING

ROUTE 639

VIRGINIA DEPARTMENT OF TRANSPORTATION

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Figure 1 - Project Study Area

Table 1: Sound Levels

	Site	Land Use	Number of Dwellings	NAC Category	Criteria	Existing (2016) Leq	Design Year (2043) Leq
CNE A	A1	Residential	1	B	67	63	68
CNE B	B1	School (Interior)	1	D	52	61	68(43)
	B2	Residential	1	B	67	48	55
	B3	Residential	1	B	67	49	56
	B4	Church (Interior)	1	D	52	62	67(42)
CNE C	C1	Residential	1	B	67	62	70
	C2	Residential	1	B	67	64	73
	C3	Residential	1	B	67	66	74
	C4	Residential	1	B	67	49	55
	C5	Residential	1	B	67	59	66
	C6	Residential	1	B	67	59	65
	C7	Residential	1	B	67	55	59
	C8	Residential	1	B	67	52	56
CNE D	D1	Daycare (Interior)	1	D	52	50	57(32)
	D2	Daycare Playground	1	C	67	48	55
	D3	Restaurant Patio	1	E	72	60	65
	D4	Church (Interior)	1	D	52	59	64(39)
	D5	Church Courtyard	1	C	67	54	60
	D6	Residential	1	B	67	63	69
	D7	Residential	1	B	67	66	71
CNE E	E1	Residential	1	B	67	69	-
	E2	Residential	1	B	67	66	74
	E3	Residential	1	B	67	45	53

Noise Impact

Table 2: Traffic Summary

FACILITY	ADT		D Factor		TRUCK PERCENTAGE		SPEED	EXISTING NB/EB			EXISTING SB/WB			DESIGN YEAR NB/EB			DESIGN YEAR SB/WB		
	Existing Year (2016)	Design Year (2043)	NB/EB	SB/WB	Med.	Heavy	MPH	Auto	MT	HT	Auto	MT	HT	Auto	MT	HT	Auto	MT	HT
Route 639	11500	35000	50%	50%	1.5%	1.5%	45	558	9	9	558	9	9	1698	26	26	1698	26	26
Route 1	6400	14000	50%	50%	1.5%	1.5%	45	310	5	5	310	5	5	679	11	11	679	11	11