Noise Study Report

Florida Department of Transportation

District 2

SR 16 PD&E Study

From International Golf Parkway to I-95

St. Johns County, Florida

Financial Management Number: 210447-5

ETDM Number: 14535

July 2025

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26, 2022, and executed by Federal Highway Administration and FDOT.

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District Two, is conducting a Project Development and Environment (PD&E) Study for the State Road (SR) 16 from International Golf Parkway (IGP) to I-95 in St. Johns County, Florida, near the City of St. Augustine, in accordance with the National Environmental Policy Act (NEPA). This study will evaluate widening the existing two-lane rural undivided roadway to a four-lane divided urban roadway. In addition, multi-modal transportation improvements including continuous bicycle and pedestrian facilities will be evaluated.

As part of this PD&E Study, a traffic noise study was performed. The traffic noise study was performed in accordance with the Federal Highway Administration's (FHWA) noise policy, *Title 23 of the Code of Federal Regulations, Part 772 (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise and Construction Noise"* (July 13, 2010), the FDOT's PD&E Manual, Part 2, Chapter 18, *Highway Traffic Noise* (July 31, 2024), and the FDOT's *Traffic Noise Modeling and Analysis Practitioners Handbook* (December 31, 2018).

The existing noise levels and future design year (2050) noise levels for the No-Build and the recommended Build Alternatives were predicted using the latest approved version of FHWA's Traffic Noise Model (TNM), Version 2.5. Design year (2050) traffic noise levels for the Build Alternative will approach or exceed the Noise Abatement Criteria (NAC) at 47 residences and a recreational area associated with Adventure Landing, an isolated non-residential/special land use site (NAC C) within the project limits. Therefore, the feasibility and reasonableness of noise barriers were considered for those noise sensitive sites predicted to be impacted by design year (2050) traffic noise in accordance with traffic noise study requirements set forth by both the FHWA and FDOT.

For thirteen of the 47 impacted residences, noise barriers were not considered a feasible noise abatement options because they represent isolated residences. For a noise barrier to be considered an acoustically feasible abatement measure, it must benefit at least two impacted

receptor sites. In addition, noise barriers were not determined to be a reasonable and feasible abatement measure for the recreational area associated with Adventure Landing. Due to the type of recreational area in Adventure Landing (i.e., mini-golf course), it's reasonable to assume that the usage would not be more than 44,326 person-hours per year. An isolated impacted Special Land Use (SLU) must have enough person-hour usage to equate to at least two residences to be found feasible.

Thirty four of the 47 impacted residences are located within four single family/multi-family residential communities including Sevilla Community, Tomoka Pines Subdivision, Soluna Apartments and Windward Ranch. The reasonableness and feasibility of noise barriers as an abatement measure were evaluated at these residential communities. The following summarizes the barriers analysis and recommendations at these locations. Note that the final decisions on noise barrier limits and heights are made during the project design phase. Also, during the design phase, an engineering constructability review will be conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined.

- **Sevilla Community** – Encompasses the impacted single-family residences (i.e., 6) within the Sevilla Community located north of SR 16 and east of Winners Way. The 16 to 22-foot-tall ground mounted noise barriers evaluated at this location meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor and all barriers meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. The 22-foot-tall barrier was determined to be most effective at this location and recommended for further consideration in the design phase. This barrier would benefit 14 receptors including the six impacted receptors and with an estimated construction cost of $880,000 or $62,857 per receptor site.
- **Tomoka Pines Subdivision** – Encompasses the impacted single-family residences (i.e., 8) within the Tomoka Pines Subdivision located north of SR 16 and east and west of Tomoka Pines Drive. Only the 22-foot-tall ground mounted barriers evaluated at this location meets the minimum noise reduction design goal of 7 dB(A) for at least one benefited

receptor and all barriers meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. Therefore, the 22-foot-tall barrier was determined to be the only barrier configuration that would meet all criteria at this location and recommended for further consideration in the design phase. This barrier design would benefit 15 receptors including the eight impacted receptors and with an estimated construction cost of $959,200 or $63,947 per receptor site.

- **Soluna Apartments** – Encompasses the impacted multi-family residences (i.e., 20) within the Soluna Apartments located south of SR 16 and east of Amber Sun Way. The 20 to 22-foot-tall ground mounted noise barrier evaluated at this location meets the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor and all barriers meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. The 22-foot-tall barrier was determined to be most effective at this location and recommended for further consideration in the design phase. This barrier design would benefit 55 receptors, including 19 of the 20 impacted receptors and with an estimated construction cost of $915,200 or $16,640 per receptor site.

Noise barriers were also evaluated at the following location but are not recommended for further consideration at this time (unless otherwise noted below) since they did not meet FDOT's Noise Reduction Design Goal and/or FDOT's Noise Barrier Cost Reasonableness Criteria or were determined not to be feasible for construction:

- **Windward Ranch** – Encompasses the impacted single family residences within the Windward Ranch Community located south of SR 16 and east of Windward Ranch Boulevard to west of Whisper Ridge Drive. The 18 to 22-foot-tall ground mounted noise barriers evaluated at this location meets the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor. However, no barriers meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. The lowest cost conceptual design (WR-CD1) is $90,000 which exceeds the reasonableness cost criteria.

Noise barriers recommended for further consideration in the design phase for Sevilla Community, Tomoko Subdivision, and Soluna Apartments are expected to reduce traffic noise by at least 5 dB(A) at 84 residences including 33 of the 47 impacted sites. The estimated cost of the recommended barriers is $2,754,400. FDOT is committed to the construction of feasible noise abatement measures for the impacted sites associated with these residential communities contingent upon the following conditions:

- Final recommendations on the construction of abatement measures are determined during the project's final design and through the public involvement process;
- Detailed noise analyses during the final design process support the need, feasibility and reasonableness of providing abatement;
- Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
- Community input supporting types, heights, and locations of the noise barrier(s) is provided to the County; and
- Safety and engineering aspects, as related to the roadway user and the adjacent property owner, have been reviewed, and any conflicts or issues resolved.

1.0 Introduction

This Project Development and Environment (PD&E) Study involves a 5.9-mile segment of SR 16 from International Golf Parkway (IGP) to I-95 in St. Johns County, Florida. A map of the project limits is shown in **Figure 1.1**. As part of this PD&E Study, a traffic noise study was performed. The traffic noise study was performed in accordance with the Federal Highway Administration's (FHWA) Noise Standard, Title 23 of the Code of Federal Regulations, Part 772 (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010), the Florida Department of Transportation (FDOT) PD&E Manual, Part 2 Chapter 18, Highway Traffic Noise (July 31, 2024), and the FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook (December 31, 2018).

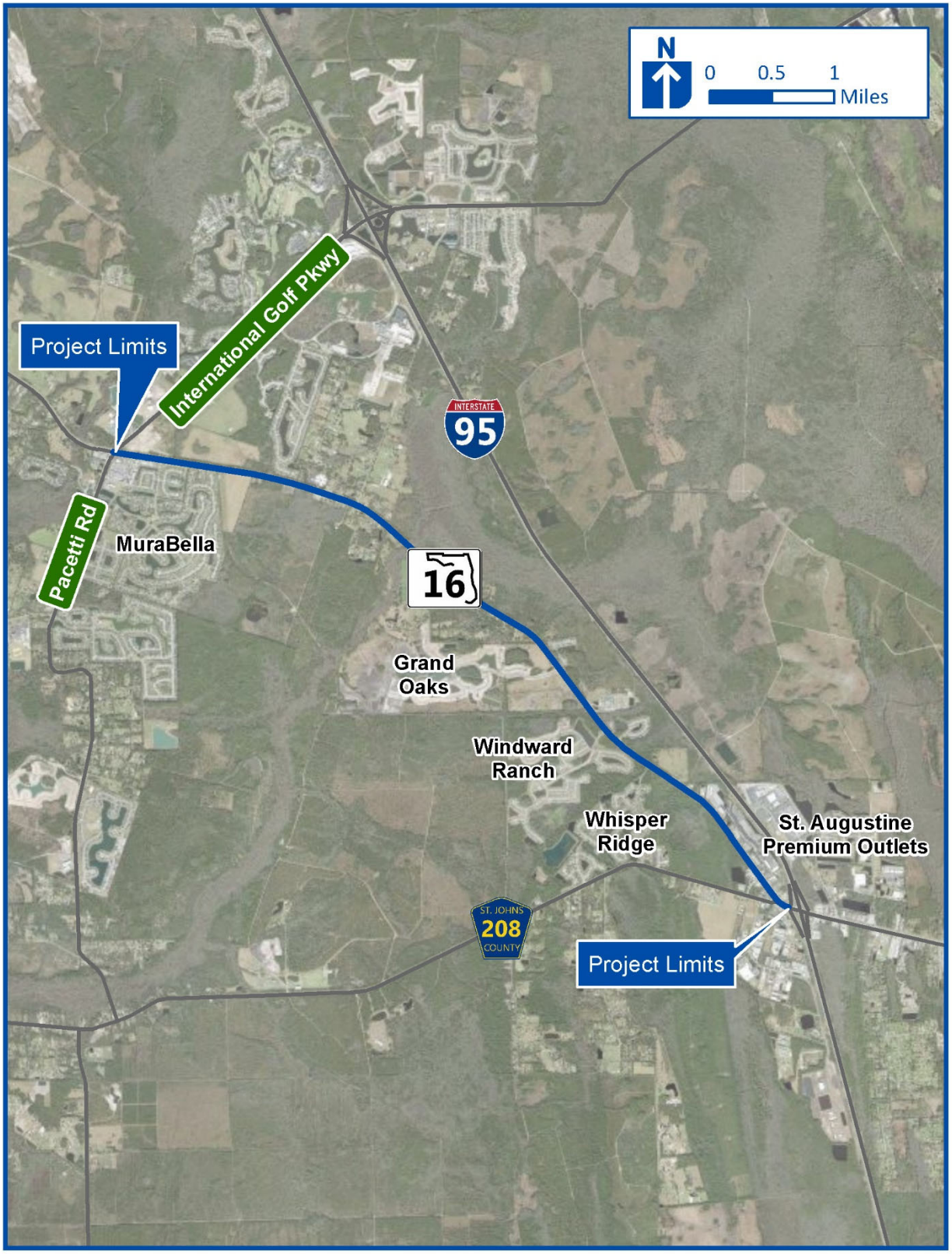
The primary objectives of this noise study were to:

- Describe the existing site conditions including noise sensitive land uses within the project limits;
- Document the methodology used to conduct the noise assessment;
- Assess the significance of traffic noise levels on noise sensitive sites for the No-Build and Build Alternatives; and
- Evaluate abatement measures for those noise sensitive sites that, under the Build Alternatives, approach or exceed the Noise Abatement Criteria (NAC) set forth by the FDOT and FHWA or where a substantial increase occurs.

Secondary objectives of this study included the consideration of construction noise and vibration impacts as well as the development of noise contours, that can be used in the future by local municipal and county government agencies to identify compatible land uses along the project roadways.

The purpose of this Noise Study Report is to present the findings of the traffic noise analysis. This report also provides technical documentation for the findings described in the project's Preliminary Engineering Report (PER) and Type 2 Categorical Exclusion.

Figure 1.1: Project Location Map



1.1 Project Description

This Project Development and Environment (PD&E) Study involves a 5.9-mile segment of SR 16 from International Golf Parkway (IGP) to I-95 in St. Johns County, Florida, near the City of St. Augustine. A map of the project limits is shown in Figure 1.1.1. Within the study limits, SR 16 is functionally classified as an urban principal arterial – other from IGP to South Francis Road and rural principal arterial-other from South Francis Road to I-95. Between IGP and the St. Augustine Outlet Mall, approximately 5.1 miles, SR 16 is a two-lane undivided roadway with sporadic turn lanes and no pedestrian or bicycle features. From the St. Augustine Outlet Mall to I-95, approximately 0.8 miles, SR 16 is generally a four-lane divided roadway with a sidewalk located on both sides of the road; however, there is a 0.3-mile stretch with no sidewalk from the start of the four-lane section to the southern entrance of the St. Augustine Outlet Mall.

This study will evaluate widening the existing two-lane rural undivided roadway to a four-lane divided urban roadway. In addition, multi-modal transportation improvements including continuous bicycle and pedestrian facilities will be evaluated. SR 16 has one existing bridge (bridge number 780064) over Turnbull Creek, in which the structural integrity and functionality of this bridge will be evaluated.

1.2 Purpose & Need

The purpose of this project is to improve traffic mobility, reduce congestion, and address safety on SR 16 from IGP to I-95.

The project is needed to address traffic congestion and safety concerns. A secondary need for the project is to accommodate planned developments.

1.3 Alternatives Analysis

SR 16 is divided into two segments: Segment 1: IGP to the St. Augustine Outlet Mall, and Segment 2: St. Augustine Outlet Mall to I-95. St. Johns County is upgrading the portion of SR 16 between

IGP and the proposed CR 2209, approximately 0.75 miles. The proposed improvements described below will tie into the County's project.

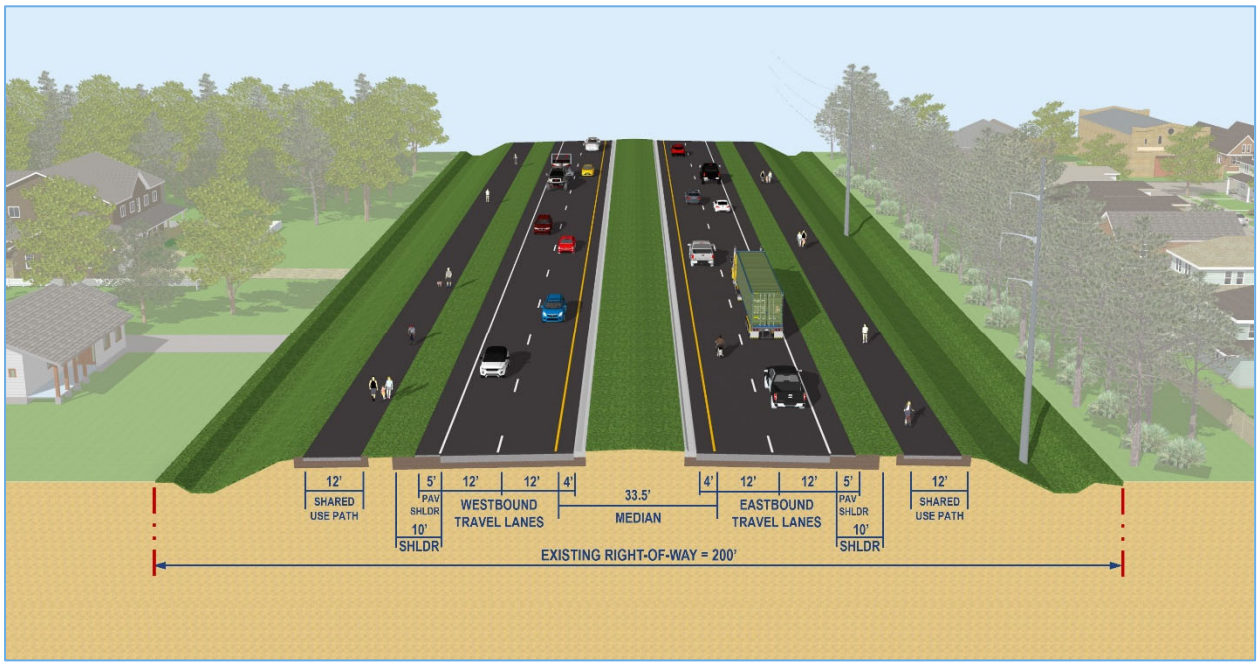
Segment 1 will require milling, resurfacing, and widening to the existing SR 16 lanes (future eastbound lanes), along with constructing additional westbound lanes. The proposed typical section features a four lane divided high-speed arterial with curb and gutter in the median and flush outside shoulders. The roadway consists of two 12-foot-wide lanes in each direction with a four-foot-wide paved inside shoulder and a 10-foot-wide outside shoulder (five-foot paved). The opposing lanes are divided by a 33.5-foot-wide raised grassed median (including the inside four-foot-wide shoulder width). A 12-foot-wide shared use path is proposed on both sides of SR 16. The existing right-of-way is approximately 200 feet, and no additional right-of-way is required to accommodate the proposed typical section. **Figure 1.2** shows the proposed typical section for Segment 1.

The proposed design speed is 45 miles per hour (mph) from IGP to CR 2209, 55 mph from east of CR 2209 to west of the St. Augustine Outlet Mall, then from St. Augustine Outlet Mall to I-95 is 45 mph. SR 16 is currently a two-lane undivided roadway which would be classified as non-restrictive, meaning there are no median openings. Upgrading Segment 1 to a four-lane divided facility will require the implementation of access management. The proposed access management classification is Class 3, which states directional median openings may be spaced at 1,320 feet and full median openings or signals may be spaced every 2,640 feet.

Segment 2 is already four lanes in the existing condition. Segment 2 is anticipated to meet the target LOS of D with proposed intersection improvements, so no additional capacity is recommended within this segment. The shared use paths from Segment 1 will be extended and will tie into the existing sidewalk. Safety and operational improvements are being evaluated within this segment of SR 16, including the improvements to the Toms Road intersection. The Toms Road intersection features a through-cut intersection to better direct vehicles through the intersection

and reduce the risk of head-on and left-turn crashes. Segment 2 will maintain its access management classification of Class 3.

Figure 1.2: Proposed Typical Section



2.0 Methodology

This study was conducted based on the methodology described in the FDOT's PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise (July 31, 2024) and FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook (December 31, 2018) and performed in accordance with Title 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010).

The noise study involved the following procedures:

- Field Measurement of Noise Levels and Noise Model Validation (see **Section 3.1**);
- Identification of Noise Sensitive Receptor Sites (see **Section 3.2**);
- Prediction of Existing and Future Noise Levels (see **Section 3.2**); and
- Assessment of Traffic Noise Impacts and Consideration of Noise Abatement Measures (see **Section 3.2**).

The FHWA's Traffic Noise Model (TNM) Version 2.5 (February 2004) was used to predict existing and future traffic noise levels and to analyze the effectiveness of noise barriers, where warranted. This model estimates the acoustic intensity at noise sensitive receptor sites from a series of roadway segments (the source). Model-predicted noise levels are influenced by several factors, such as vehicle speed and distribution of vehicle types. Noise levels are also affected by characteristics of the source-to-receptor site path, including the effects of intervening barriers, structures (e.g., houses), ground surface type (hard or soft), and topography.

Representative receptor sites were used as inputs to the TNM 2.5 to estimate noise levels associated with existing and future conditions within the project limits. These sites were chosen based on noise sensitivity, roadway proximity, anticipated impacts from the proposed project, and homogeneity (i.e., the site is representative of other nearby sites). For single family residences, traffic noise levels were predicted at the edge of the dwelling unit closest to the nearest primary roadway. For other noise sensitive sites that may be impacted, traffic noise levels were predicted where the exterior activity occurs. For the prediction of interior noise levels, receptor sites were

placed ten feet inside the building at the edge closest to the roadway. Building noise reduction factors identified in Figure 18-3 in Part 2, Chapter 18 of the PD&E Manual and window conditions were used to estimate noise reduction due to the physical structure.

The following sections describe the noise metrics, traffic data, and noise abatement criteria used in this study, as well as the existing and future land uses within the project area.

2.1 Noise Metric

Noise levels documented in this report represent the hourly equivalent sound level [Leq(h)]. Leq(h) is the steady-state sound level, which contains the same amount of acoustic energy as the actual time-varying sound level over a 1-hour period. Leq(h) is measured in A-weighted decibels [dB(A)], which closely approximates the human frequency response. Sound levels of typical noise sources and environments are provided in **Table 2.1** as a frame of reference.

2.2 Traffic Data

Predicted traffic noise levels are primarily dependent on traffic volumes, vehicle mix, and vehicle speeds. The traffic data used in this noise analysis for the Existing (2023), No-Build (2050), and Build (2050) conditions are included in Appendix A, respectively. These tables summarize the AM and PM peak hourly demand volumes, Level of Service (LOS) C volumes, vehicle speeds, and the percentage of heavy trucks, medium trucks, buses, and motorcycles in the Design Hour. The traffic volumes used to predict noise levels included the least of either LOS C or the peak hour traffic volumes. In overcapacity situations, LOS C volumes represent the highest traffic volume traveling at the highest average speed, which typically generates the highest noise levels at a given site.

Table 2.1: Sound Levels of Typical Noise Sources and Environment

Common Outdoor Activities	Noise Level DB(A)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-Over at 1,000 feet		
	--100--	
Gas Lawn Mower at 3 feet		
	--90--	
Diesel Truck at 50 feet, 50 mph		Food Blender at 1 m (3 ft)
	--80--	Garbage Disposal at 1 m (3 ft)
Noise Urban Area (Daytime)		
Gas Lawn Mower at 100 feet	--70--	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 feet	--60--	
		Large Business Office
Quiet Urban Daytime	--50--	Dishwasher Next Room
Quiet Urban Nighttime	--40--	Theater; Large Conference Room (background)
Quiet Suburban Nighttime		Library
	--30--	
Quiet Rural Nighttime		Bedroom at Night; Concert Hall (background)
	--20--	
	--10--	
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, p. 18

2.3 Noise Abatement Criteria

The FHWA has established Noise Abatement Criteria (NAC) for land use activity categories, which are presented in **Table 2.2**. Maximum noise threshold levels, or criteria levels, have been established for five of the seven activity categories. These criteria determine when an impact occurs and when consideration of noise abatement is required. Noise abatement measures must be considered when predicted noise levels approach or exceed the NAC levels or when a substantial noise increase occurs. A substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 dB(A) or more as a result of the transportation improvement project. The FDOT defines "approach" as within 1.0 dB(A) of the FHWA criteria.

Noise sensitive receptor sites include properties where frequent exterior human use occurs and where a lowered noise level would be of benefit. This includes residential land use (Activity Category B); a variety of nonresidential land uses not specifically covered in Activity Category A (i.e., lands on which serenity and quiet are of extraordinary significance) including parks and recreational areas, medical facilities, schools, and places of worship (Activity Category C); and commercial and developed properties including offices, hotels, and restaurants with exterior areas of use (Activity Category E). Noise sensitive sites also include interior use areas where no exterior activities occur for facilities such as auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, recording studios, schools, and television studios (Activity Category D). Activity Categories F and G, which include commercial and developed properties without exterior areas of use, do not have noise abatement criteria levels. Activity Category F includes land uses such as industrial and retail facilities that are not considered noise sensitive. Activity Category G includes undeveloped lands that are not permitted for development.

2.4 Noise Abatement Measures

When traffic noise associated with a proposed project is predicted to approach, meet, or exceed the NAC at a noise sensitive site, noise abatement measures must be considered in accordance

Table 2.2: Noise Abatement Criteria [Hourly A-Weighted Sound Level-decibels (dB(A))]

Activity Category	Activity Leq(h)[1]		Evaluation Location	Description of Activity Category
	FHWA	FDOT		
A	57	56	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[2]	67	66	Exterior	Residential
C[2]	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	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[2]	72	71	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.

(Based on Table 1 of 23 CFR Part 772)

[1] The Leq(h) Activity Criteria values are for impact determination only, and are not a design standard for noise abatement measures.

[2] Includes undeveloped lands permitted for this activity category.

Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.

with 23 CFR Part 772. The most common and effective noise abatement measure for projects such as this is the construction of noise barriers. Noise barriers reduce noise by blocking the sound path between a roadway and a noise sensitive area. To be effective, noise barriers must be long, continuous (i.e., no intermittent openings), and have sufficient height to block the path between the noise source and the receptor site. The FHWA's Highway Traffic Noise: Analysis and Abatement Guidance (December 2011) indicates the ends of the noise barriers should, in general, extend in each direction approximately four times as far as the distance from the receptor site to the noise barrier. Other abatement measures that can be considered include traffic management, alignment modification, and property acquisition.

For noise abatement measures to be recommended for further consideration in the design phase of the project, they must be determined to be both feasible and reasonable. A wide range of factors are used to evaluate the feasibility and reasonableness of noise abatement measures. Feasibility deals with engineering considerations, including the ability to construct a noise barrier using standard construction methods and techniques as well as with the ability to provide a reduction of at least 5 dB(A) to the impacted receptor sites. For example, given the topography of a particular location, can the minimum noise reduction [5.0 dB(A)] be achieved given certain access, drainage, utility, safety, and maintenance requirements? In addition, for a noise barrier to be considered acoustically feasible, at least two impacted receptor sites must achieve at least a 5 dB(A) reduction.

Reasonableness implies that common sense and good judgment were applied in a decision related to noise abatement. Reasonableness includes the consideration of the cost of abatement, the amount of noise abatement benefit, and the consideration of the viewpoints of the impacted and benefited property owners and tenants. To be deemed reasonable, the estimated cost of the noise barrier, or other noise abatement measures, needs to be equal to or below FDOT's reasonable cost criteria (described below), must attain FDOT's noise reduction design goal of 7 dB(A) at one or more benefited receptor sites, and it is the desire of FDOT to obtain a response for or against the noise barrier from a numerical majority (greater than 50%) of the benefited

receptors (owners and residents) that provide a response to the noise barrier survey used to solicit their viewpoints. If not supported by a majority of the survey respondents, a noise barrier or abatement measure will not be deemed reasonable. Noise barrier surveys are typically performed in the project's design phase.

The evaluation of noise barriers for impacted residential (Activity Category B) and nonresidential areas (Activity Categories A, C, D, and E) are based on different methods and are evaluated separately. When determining the cost reasonableness of a conceptual noise barrier design for a residential area, $64,000 per benefited receptor is considered the upper limit, using FDOT's current standard construction cost of $40.00 per square foot. A benefited receptor site is defined as a noise sensitive site that will obtain a minimum of 5 dB(A) of noise reduction as a result of a specific noise abatement measure regardless of whether or not they are identified as impacted. Only benefited receptor sites are included in the calculation of reasonable cost for a particular noise abatement measure. Noise barriers for non-residential areas are assessed using FDOT's *Methodology to Evaluate Highway Traffic Noise at Special Land Uses* (December 2023)".

If the noise abatement measure has been determined to be reasonable and feasible, the viewpoint of the impacted and benefited property owners must be considered. During a PD&E Study, the viewpoint of the potentially benefited receptors (property owners/tenants) regarding noise abatement is gathered during workshops and at the Public Hearing, if one is held. During the design phase of the project, a more detailed process is implemented to include noise abatement workshops and/or public surveys, to determine the wishes of the benefited receptor sites. Each benefited receptor, including both the owner and resident, is given the opportunity to provide input regarding their desires to have the recommended noise abatement measure constructed. The goal of this process is to obtain a response for or against the noise barrier from a majority of benefited receptors (property owners and tenants) that respond to the survey. If not supported by a majority of the survey respondents, a noise barrier or abatement measure will not be deemed reasonable.

3.0 Traffic Noise Analysis

3.1 Model Validation

Noise measurements were collected at five representative locations (MS-1 to MS-5) within the project limits. This was done to verify that TNM-predicted existing noise levels are representative of actual levels along SR 16 and to confirm that traffic noise is the main, or dominant, noise source. Noise measurements at these sites were taken on September 17 and 18, 2024. The locations of these monitoring sites are described in **Table 3.1** and depicted in **Figure 3.1**.

The noise monitoring was completed using Larson-Davis Model 870 sound-level analyzers, in accordance with the methodology established by the FHWA and documented in Noise Measurement Field Guide (FHWA HEP-18-066) (June 1, 2018) and Noise Measurement Handbook (FHWA HEP-065) (June 1, 2018). The A-weighted frequency scale was used, and the sound meter was calibrated to 114 dB(A) using a Larson-Davis Model CA250 sound-level calibrator. Monitoring was conducted for three 10-minute intervals with the microphone approximately five feet above the land surface.

Traffic information, including the number of passenger cars and trucks, and average speeds, were collected at the time of noise monitoring. A K15-K Doppler Radar Gun was used to obtain average operating speeds for cars, medium trucks, heavy trucks, buses, and motorcycles. Since all noise levels in this report are based on a one-hour period, the field recorded traffic volumes were adjusted upward to reflect hourly volumes. The dates, times, traffic data, and the measured noise levels are presented in **Table 3.1.**

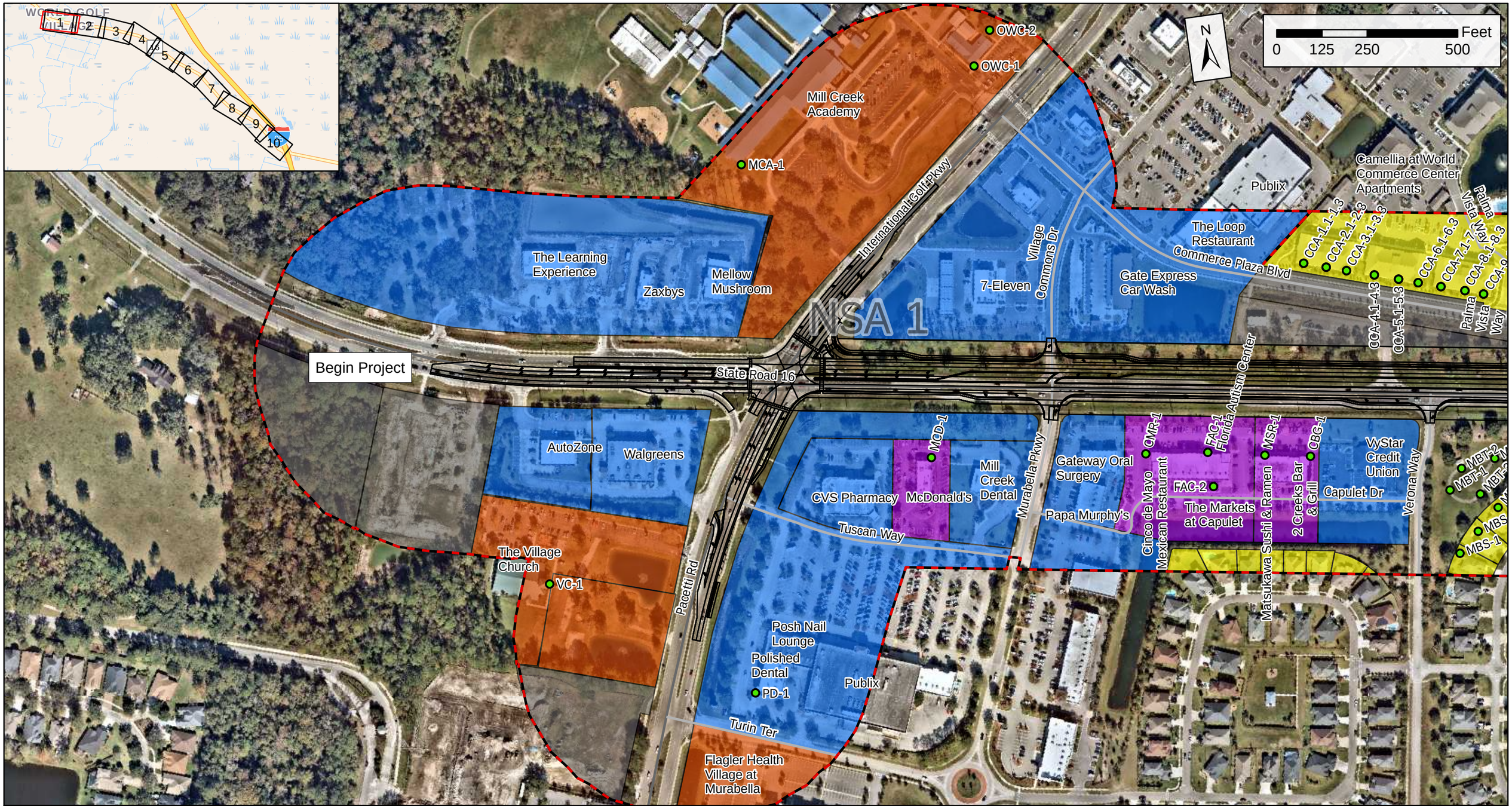
Traffic noise was the dominant noise source at each of the monitoring sites. To verify the computer noise model, the TNM-predicted noise levels for Monitoring Sites MS-1 through MS-5 were compared to measured noise levels. When measured noise levels are within +/- 3.0 dB(A) of the computer-predicted levels, the model is considered validated. All of the five measured noise levels were within +/- 3.0 dB(A) of the TNM-predicted levels (see **Table 3.1**). Because the

Table 3.1: Noise Monitoring Data and TNM 2.5 Validation Results

General Information		Begin Time	End Time	SR 16 Traffic Flow Direction (Number of Travel Lanes)	Distance to Nearest Traffic Lane (feet)	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles		Monitored Leq (h) dB(A)	TNM Predicted Leq (h) dB(A)	Difference Leq (h) dB(A)	Predicted Levels Within +/- 3 dB(A) of Monitored Levels?
Monitor Site Identification Number	Monitoring Location / Road Name (Date)					Vehicles per Hour	Average Speed (mph)	Vehicles per Hour	Average Speed (mph)	Vehicles per Hour	Average Speed (mph)	Vehicles per Hour	Average Speed (mph)	Vehicles per Hour	Average Speed (mph)				
MS-1	Murabella Subdivision / South of SR 16 and West of San Giacomo Road (September 17, 2024)	7:10 PM	7:20 PM	Eastbound (1 Lane)	125	318	48.0	6	48.0	12	54.0	0	0.0	6	48.0	57.5	58.5	1.0	YES
				Westbound (1 Lane)		492	49.4	0	0.0	0	0.0	0	0.0	0	0.0				
		7:20 PM	7:30 PM	Eastbound (1 Lane)		402	50.6	0	0.0	0	0.0	0	0.0	0	0.0	55.8	58.2	2.4	YES
				Westbound (1 Lane)		570	48.6	0	0.0	0	0.0	0	0.0	6	48.6				
		7:30 PM	7:40 PM	Eastbound (1 Lane)		318	49.3	0	0.0	0	0.0	0	0.0	6	52.0	57.7	57.2	-0.5	YES
				Westbound (1 Lane)		420	48.2	6	46.5	0	0.0	0	0.0	0	0.0				
MS-2	Residential Community / Southwest of SR 16 and Northwest of Turnbull Drive (September 17, 2024)	6:25 PM	6:35 PM	Eastbound (1 Lane)	130	600	54.1	0	0.0	0	0.0	0	0.0	0	0.0	64.7	62.9	-1.8	YES
				Westbound (1 Lane)		600	55.4	12	56.0	12	55.5	0	0.0	6	55.0				
		6:35 PM	6:45 PM	Eastbound (1 Lane)		444	55.4	18	58.0	6	55.0	0	0.0	0	0.0	65.2	62.9	-2.3	YES
				Westbound (1 Lane)		726	55.8	12	52.0	0	0.0	0	0.0	0	0.0				
		6:45 PM	6:55 PM	Eastbound (1 Lane)		552	53.8	0	0.0	0	0.0	0	0.0	0	0.0	64.7	61.9	-2.8	YES
				Westbound (1 Lane)		522	55.9	6	55.9	0	0.0	0	0.0	6	55.9				
MS-3	Tomoka Pines Subdivision / East of SR 16 and South of Tomoka Pines Drive (September 18, 2024)	12:10 PM	12:20 PM	Eastbound (1 Lane)	160	594	52.1	12	52.1	0	0.0	0	0.0	0	0.0	60.5	61.5	1.0	YES
				Westbound (1 Lane)		792	55.7	30	55.7	12	45.0	24	48.0	12	55.7				
		12:20 PM	12:30 PM	Eastbound (1 Lane)		684	52.1	24	45.0	24	52.7	0	0.0	6	52.1	58.9	61.7	2.8	YES
				Westbound (1 Lane)		624	53.2	0	0.0	6	53.2	36	50.5	0	0.0				
		12:30 PM	12:40 PM	Eastbound (1 Lane)		474	53.8	0	0.0	0	0.0	0	0.0	0	0.0	58.7	59.5	0.8	YES
				Westbound (1 Lane)		588	52.3	42	52.3	0	0.0	12	48.0	0	0.0				
MS-4	Windward Ranch / South of SR 16 and North of Turnbull Drive (September 18, 2024)	11:20 AM	11:30 AM	Eastbound (1 Lane)	135	516	49.9	12	52.0	18	51.7	0	0.0	0	0.0	61.3	61.2	-0.1	YES
				Westbound (1 Lane)		516	53.0	30	53.0	18	47.0	6	50.0	0	0.0				
		11:30 AM	11:40 AM	Eastbound (1 Lane)		576	50.1	12	50.1	18	50.5	0	0.0	6	50.1	62.1	61.8	-0.3	YES
				Westbound (1 Lane)		588	54.7	30	54.7	12	54.0	6	54.7	0	0.0				
		11:40 AM	11:50 AM	Eastbound (1 Lane)		570	50.2	30	50.2	6	52.0	0	0.0	0	0.0	62.6	61.1	-1.5	YES
				Westbound (1 Lane)		456	52.8	6	52.8	24	55.0	12	52.8	0	0.0				
MS-5	Adventure Landing / East of SR 16 and North of Toms Road (September 18, 2024)	10:10 AM	10:20 AM	Eastbound (2 Lane)	80	648	48.0	18	48.0	0	0.0	6	51.0	0	0.0	65.2	63.5	-1.7	YES
				Westbound (2 Lane)		504	49.4	18	49.4	6	48.0	6	45.0	0	0.0				
		10:20 AM	10:30 AM	Eastbound (2 Lane)		612	50.6	30	48.0	18	39.7	0	0.0	0	0.0	65.2	63.3	-1.9	YES
				Westbound (2 Lane)		378	48.6	6	48.6	6	43.0	6	48.6	12	48.6				
		10:30 AM	10:40 AM	Eastbound (2 Lane)		564	50.2	6	45.0	18	50.2	0	0.0	0	0.0	66.1	63.4	-2.7	YES
				Westbound (2 Lane)		600	48.5	12	48.5	0	0.0	0	0.0	0	0.0				

X:\P\Noise_Studies\SR 16 PD&E Study\Noise Monitoring\Tables\[Table_3-1_SR16_NoiseMonitoringDataSummary_NB_9-13-2024.xlsx]Table3-1_NSR SR 16 9-13-2024

Minimum	55.8	57.2	-2.8
Maximum	66.1	63.5	2.8
Average Difference Between TNM 2.5 Predicted Levels and Monitored Levels			-0.5



FDOT

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 1 of 10

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

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- Recommended Noise Barrier
- Non Recommended Noise Barrier

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- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 2 of 10

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 3 of 10

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

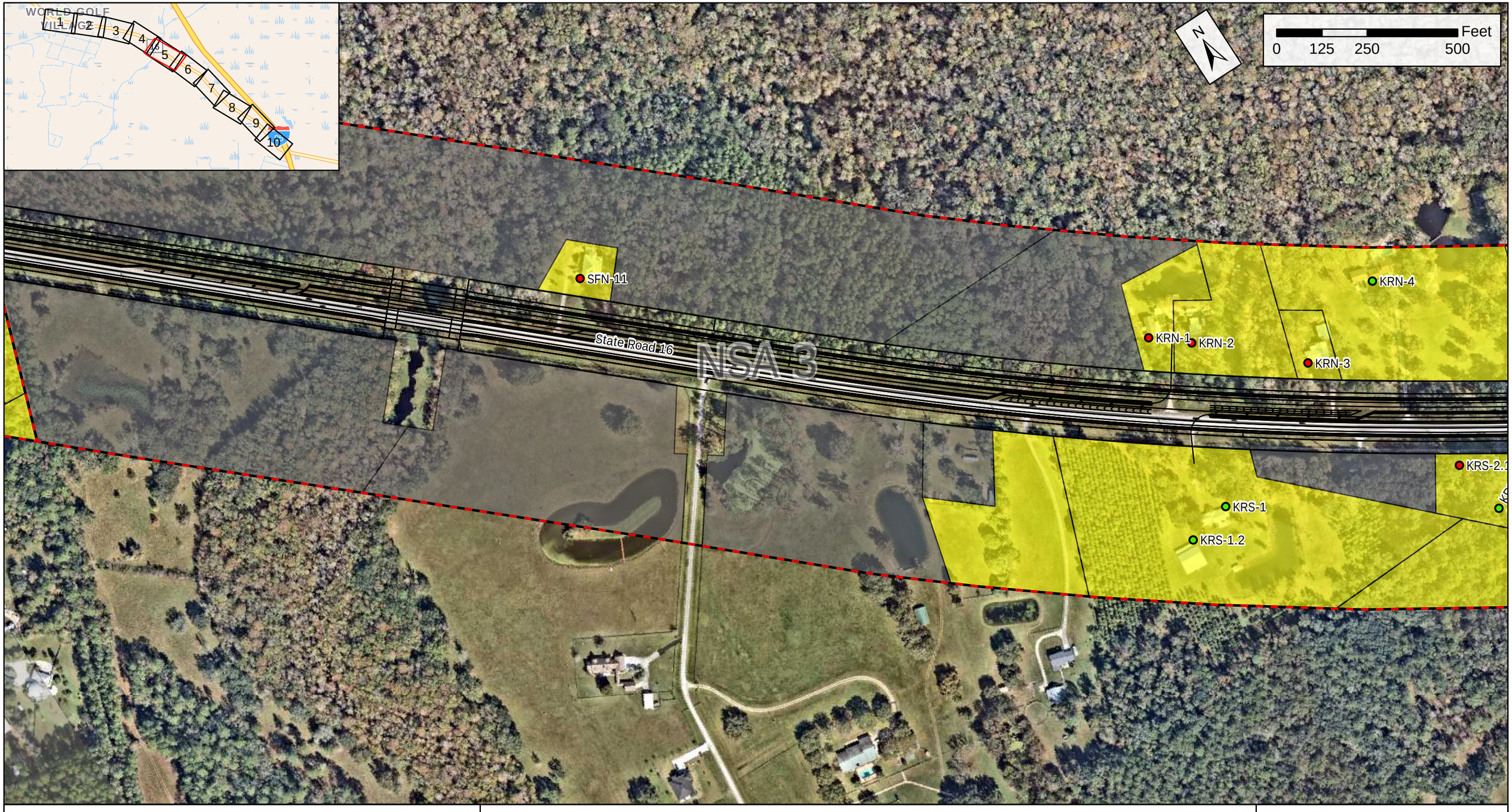
Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1 Noise Analysis Map

Sheet 4 of 10



FDOT

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 5 of 10

FDOT

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

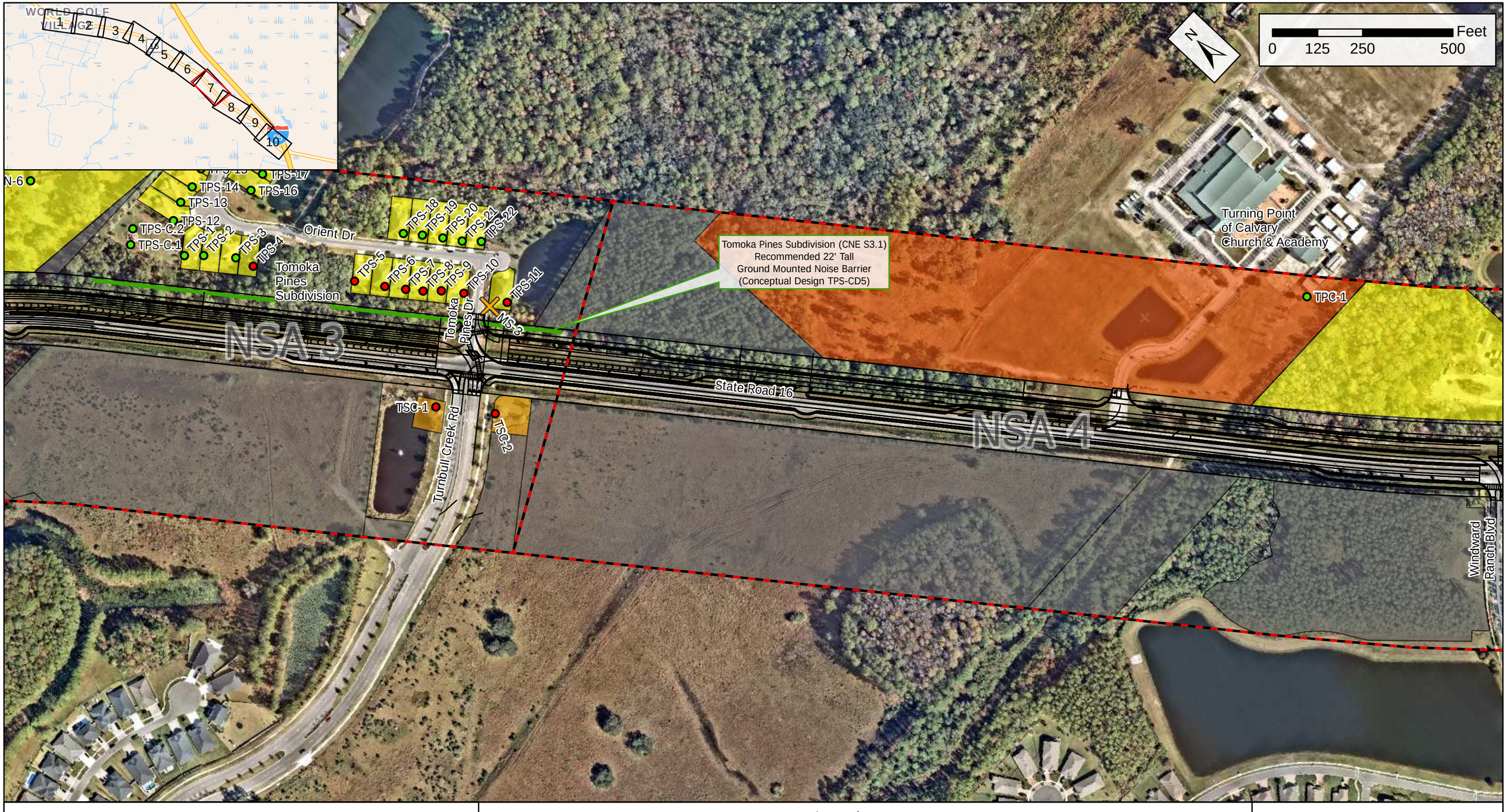
Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 6 of 10



SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1 Noise Analysis Map

Sheet 7 of 10

SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

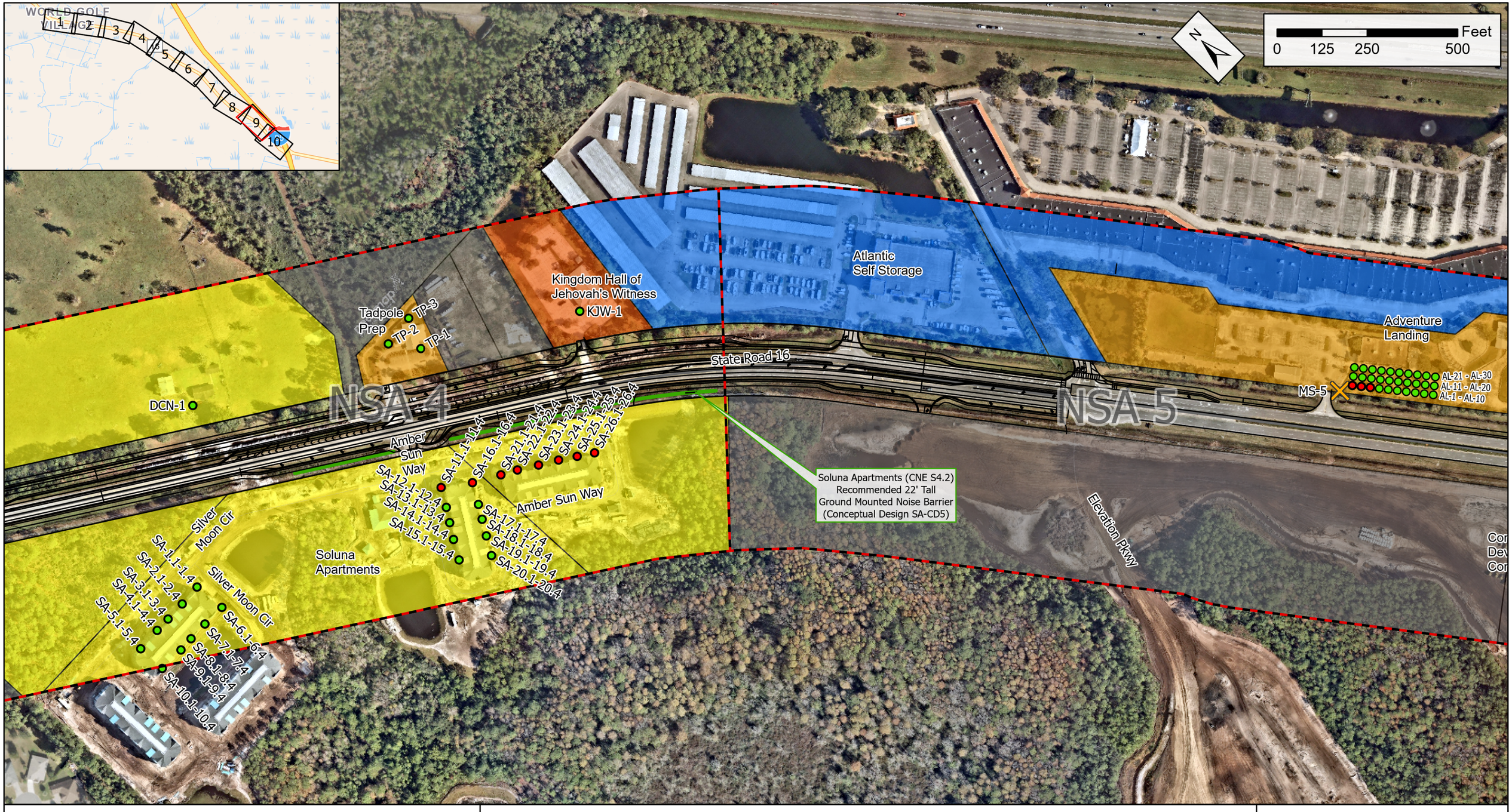
Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 8 of 10



SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

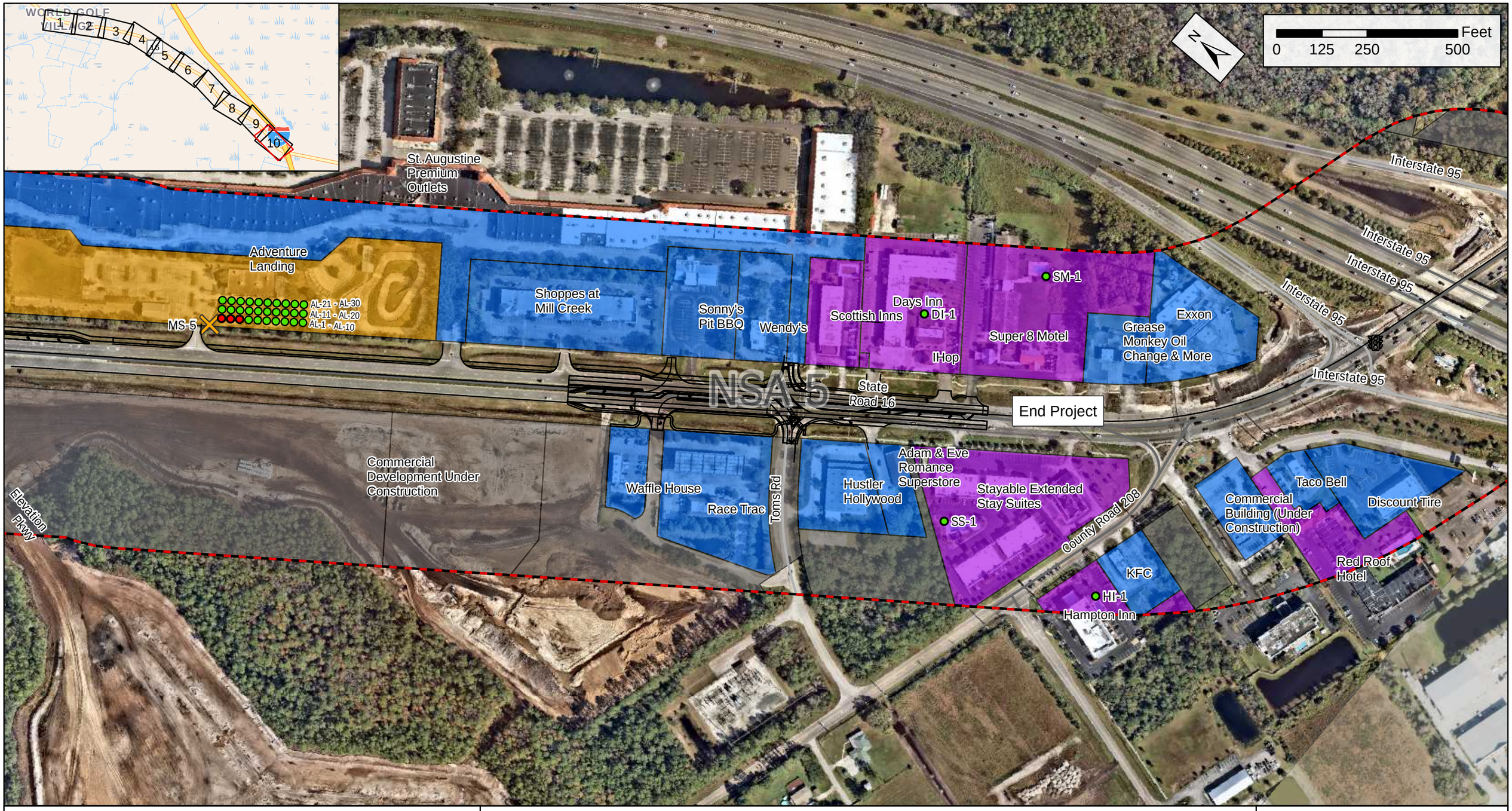
Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 9 of 10



SR 16 Project Development and Environment (PD&E) Study
From International Golf Parkway to I-95
St. Johns County, Florida
Financial Project ID (FPID) Number: 210447-5

Legend

Predicted Noise Levels
- < Noise Abatement Criteria
- ≥ Noise Abatement Criteria
- Monitoring Sites

Proposed Noise Barriers
- Recommended Noise Barrier
- Non Recommended Noise Barrier

Land Use by Noise Activity Category (NAC)
- NAC B: Residential
- NAC C: Other Sensitive Land Use
- NAC D: Institutional (Interior)
- NAC E: Sensitive Commercial
- NAC F: Non-Sensitive Commercial
- Vacant
- NSAs

March 2025

Figure 3.1
Noise Analysis Map

Sheet 10 of 10

TNM-predicted noise levels are within +/- 3.0 dB(A) of the measured noise levels, the model has been validated and is considered acceptable for predicting existing and future traffic noise levels along SR 16.

3.2 Predicted Noise Levels

To facilitate the noise impact analysis, the project was divided into five noise study areas as listed below. Noise sensitive land uses include existing single and multi-family residences and associated recreational areas, education/day care facilities and associated recreational areas, medical facilities, and outdoor seating areas associated with restaurants. Each of these areas was evaluated for traffic noise impacts. The locations of the five noise study areas (NSA) are depicted in **Figure 3.1**. The locations and description of the representative sites used in the noise analysis are also presented in **Figure 3.1** and are described in **Table 3.2** included in **Appendix C**. Each of the representative receptor sites was given a unique designation (e.g., TPS-1 and SC-2). The first value represents the neighborhood/area the receptor site is located within, and the second value represents a unique/sequential receptor site number for that NSA.

- Noise Study Area 1 - SR 16 from West of IGP/Pacetti Road to Winner Way
- Noise Study Area 2 - SR 16 from Winner Way to East of Turnbull Drive
- Noise Study Area 3 - SR 16 from East of Turnbull Drive to East of Turnbull Creek Road
- Noise Study Area 4 - SR 16 from East of Turnbull Creek Road to West of Elevation Parkway
- Noise Study Area 5 - SR 16 from West of Elevation Parkway to Interstate 95

Table 3.2 (see **Appendix C**) also includes the predicted existing and future design year (2050) No-Build and Build Alternative noise levels. Predicted design year (2050) noise levels for the Build Alternative were compared to the NAC and to the predicted existing conditions noise levels to assess potential noise impacts associated with the project. As identified in **Table 3.2** and summarized in **Table 3.3**, traffic noise impacts occur and will require consideration of noise abatement measures (i.e., noise barriers). With the recommended Build Alternative, design year (2050) traffic noise levels will approach, meet, or exceed the NAC at 47 residences (NAC B) and three of the 30 receptor sites within Adventure Landing, a commercial recreational area (NAC C)

along the project corridor (see **Figure 3-1**). The proposed improvements associated with the Build Alternative do not result in any substantial noise increases (i.e., greater than 15 dB(A) over existing levels).

The FDOT noise policy requires that the reasonableness and feasibility of noise abatement be considered when the FHWA NAC is approached, met, or exceeded at a noise sensitive site (see Section 2.4). The most common and effective noise abatement measure for projects such as this is the construction of noise barriers. Common Noise Environments (CNEs) were used to facilitate the evaluation of noise barriers at the impacted residential receptor sites along the project corridor. A CNE represents a group of impacted receptor sites that are exposed to similar noise sources and levels, traffic volumes, traffic mix, speeds, and topographic features, that would benefit from the same noise barrier or noise barrier system (i.e., overlapping/continuous noise barriers). In addition, determining the reasonable cost of a noise barrier involves a review of the cost per benefited receptor site of a noise barrier benefiting a single location or CNE (e.g., a subdivision or contiguous impact area).

Within Noise Study Area 1, no residential or non-residential sites were impacted by design year (2050) traffic noise levels (see **Table 3.3**). For one of the more noise sensitive sites within NSA 1 (i.e., Florida Autism Center), the predicted interior [36.0 dB(A)] and exterior [47.5 dB(A)] design year noise levels were below the impact criteria [51.0 dB(A) and 66.0 dB(A), respectively]. The lower posted speed (i.e., 45 mph) within this segment minimized the traffic noise impacts.

Within Noise Study Area 2, there are eleven impacted receptor sites. Five of these sites were isolated residences (Receptors SFN-6, SFS-1, SFS-2, SFS-5, and SFS-9). However, noise barriers were not evaluated for these impacted sites since noise barriers are not considered acoustically feasible for isolated residential impacts. The remaining six impacted sites are within the Sevilla community and were considered for abatement identified as CNE S2.1 as described in **Section 3.3**.

Within Noise Study Area 3, there are 16 impacted receptor sites. Eight of these sites were isolated residences (Receptors KRN-1, KRN-2, KRN-3, KRS-2.1, KRS-4, TSC-1, TSC-2, and SFN-11). Noise barriers were not evaluated for these impacted sites since noise barriers are not considered acoustically feasible for isolated residential impacts. The remaining eight single family residences impacted are within the Tomoka Pines Subdivision and were considered for noise abatement identified as CNE S3.1 as described in **Section 3.4**.

Within Noise Study Area 4, there are 20 impacted receptor sites. Four single family residences impacted are within Windward Ranch and were considered for noise abatement, identified as CNE S4.1 as described in **Section 3.5**. Sixteen multi-family units within the Soluna Apartments were impacted and were considered for noise abatement, identified as CNE S4.2 as described in **Section 3.6**.

Within Noise Study Area 5, Adventure Landing represents a special land use (SLU) impacted by the project. Adventure Landing represents an isolated noise sensitive area located north of SR 16 west of Toms Road (see **Figure 3.1 Sheet 10**). Adventure Landing is described as an aquatic complex chain with additional land attractions including mini-golf, batting cages, laser tag, and go-karts. The mini-golf course area, approximately a half-acre, is located adjacent to SR 16 and represents the noise sensitive area potentially impacted by the SR 16 improvements. Three of the 30 receptor sites (~10%) within Adventure Landing, based on a grid spacing of 25 feet within the approximately half-acre recreational facility, are impacted. These three impacted sites are located at the northwest end of the facility and adjacent to the entrance road to Adventure Landing and associated parking areas that contributed to a slightly higher noise level in this area. Noise barriers were not evaluated or consider feasible at this location since the potential benefited area is not expected to have more than 44,326 person-hours per year of use. An isolated impacted SLU must have enough person-hour usage to equate to at least two equivalent residences to be found feasible. Adventure Landing is open seven days a week from 2 PM to 8 PM from Monday to Thursday, 2 PM to 9 PM on Friday, and 11 AM to 9 PM on Saturday and Sunday (i.e., ~2,548 hours in year).

Table 3.3: Summary of Traffic Noise Impacts by Noise Study Area

Noise Study Area	Representative Noise Receptor Site Designation	Noise Abatement Activity Category - Criteria	Impacted by Traffic Noise?	Number of Residential Sites Impacted	Number of Special Land Uses Impacted?	Noise Barriers Potentially Feasible?	Common Noise Environment (CNE) ID / Noise Barrier Analysis Section
SR 16 PD&E Study from International Golf Parkway to I-95							
NSA 1	SR 16 from West of International Golf Parkway/Pacetti Road to Winner Way	Residential NAC B - 66 dB(A)	NO	---	---	---	---
		Institutional Interior NAC D - 51 dB(A)	NO	---	---	---	---
		Commerical NAC E - 71 dB(A)	NO	---	---	---	---
NSA 2	SR 16 from Winner Way to East of Turnbull Drive	Residential NAC B - 66 dB(A)	YES	6	---	YES	CNE S2.1 / Section 3.3
			YES	5 (Receptors SFN-6, SFS-1, SFS-2, SFS-5, SFS-9)	---	NO (Not Acoustically Feasible - Isolated Residences)	---
		Institutional Interior NAC D - 51 dB(A)	NO	---	---	---	---
		Other Sensitive Land Use NAC C - 66 dB(A)	NO	---	---	---	---
NSA 3	SR 16 from East of Turnbull Drive to East of Turnbull Creek Road	Residential NAC B - 66 dB(A)	YES	8	---	YES	CNE S3.1 / Section 3.4
			YES	8 (Receptors KRN-1, KRN-2, KRN-3, KRS-2.1, KRS-4, TSC-1, TSC-2, SFN-11)	---	NO (Not Acoustically Feasible - Isolated Residences)	---
		Other Sensitive Land Use NAC C - 66 dB(A)	NO	---	---	---	---
NSA 4	SR 16 from East of Turnbull Creek Road West of Elevation Parkway	Residential NAC B - 66 dB(A)	YES	20	---	YES	CNE S4.1 / Section 3.5 CNE S4.2 / Section 3.6
		Institutional Interior NAC D - 51 dB(A)	NO	---	---	---	---
NSA 5	SR 16 from East of Elevation Parkway to Interstate 95	Other Sensitive Land Use NAC C - 66 dB(A)	YES	---	1	---	---
		Commerical NAC E - 71 dB(A)	NO	---	---	---	---
Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)				47	---	---	---
Total Number of Non-Residential / Special Land Use Sites Equal to or Greater than the Noise Abatement Criteria (NAC)				---	1	---	---

X:\P\Noise_Studies\SR 16 PD&E Study\NSR\Tables\[Table_3-2&3_NoiseSites&PNLs_SR16_1-14-2025_WF.xlsx]Table 3.3 Summary(Working)

Due to the nature of the facility (i.e., similar to golf course) it's not reasonable to assume that the mini-golf course would experience this level of activity when the facility is open. Therefore, a noise barrier is not recommended for further consideration in the design phase for the impacted sites associated with Adventure Landing.

As presented above and summarized in **Table 4.1**, four separate CNEs were used to assess noise barriers for the noise sensitive sites that approach, meet, or exceed the NAC. The analysis of noise barriers and recommendations are summarized by each of the four CNEs in **Section 3.3** through **Section 3.6**. The locations and limits of the noise barriers (both recommended and not recommended) are depicted on **Figure 3.1.**

3.3 Common Noise Environment S2.1 (Sevilla Community)

Common Noise Environment S2.1 encompasses the impacted single-family residences within the Sevilla Community located north of SR 16 and east of Winners Way (see **Figure 3.1 Sheet 3**). Design year (2050) noise levels for the Build Alternative are predicted to approach, meet, or exceed the NAC at six residences within this area; therefore, noise barriers were evaluated at this location as an abatement measure. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area.

The results of the noise barrier analysis for this area are summarized in **Table 3.4**. Five conceptual right-of-way ground mounted noise barrier designs (SC-CD1 through SC-CD5) were evaluated to reduce traffic noise levels at the six impacted receptors. Four out of five of the conceptual noise barrier designs meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor and all meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. Conceptual Barrier Design SC-CD5 was determined to be the most effective noise barrier for this location.

Conceptual Barrier Design SC-CD5 represents one 22-foot-tall right-of-way ground mounted noise barrier segment. The barrier segment extends approximately 1,000 feet, from Station 158+00 to Station 168+00. This conceptual noise barrier design would benefit 14 receptors

including the six impacted receptors and would provide an average noise reduction of 9.0 dB(A) at benefited receptor sites with a maximum reduction of 11.7 dB(A). The estimated construction cost of this conceptual barrier design is $880,000 or $62,857 per benefited receptor site which meets the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site.

Conceptual Noise Barrier Design SC-CD5 is recommended for further consideration and public input during the project's design phase at this location (CNE S2.1). This conceptual noise barrier design satisfies the reasonableness and feasibility factors considered in the evaluation of noise abatement measures during a PD&E Study. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review will be conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited receptors is determined.

3.4 Common Noise Environment S3.1 (Tomoka Pines Subdivision)

Common Noise Environment S3.1 encompasses the impacted single-family residences within the Tomoka Pines Subdivision located north of SR 16 and east and west of Tomoka Pines Drive (see **Figure 3.1 Sheet 7**). Design year (2050) noise levels for the Build Alternative are predicted to approach, meet, or exceed the NAC at eight residences within this area; therefore, noise barriers were evaluated at this location as an abatement measure. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area.

The results of the noise barrier analysis for this area are summarized in **Table 3.5**. Five conceptual right-of-way ground mounted noise barrier designs (TPS-CD1 through TPS-CD5) were evaluated to reduce traffic noise levels at the eight impacted receptors. Only one of the conceptual noise barrier designs meets the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor and the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site (i.e. TPS-CD5). Conceptual barrier design TPS-CD5 was determined to be the most feasible and cost reasonable noise abatement measure for this location.

Conceptual Barrier Design TPS-CD5 represents three 22-foot-tall right-of-way ground mounted noise barrier segments. The first barrier segment extends approximately 500 feet, from Station

277+00 to Station 282+00. The second barrier segment extends approximately 370 feet, from Station 283+60 to Station 287+30. Finally, the third barrier segment extends approximately 220 feet, from Station 287+80 to Station 291+00. This conceptual noise barrier design would benefit 15 receptors including the eight impacted receptors and would provide an average noise reduction of 7.0 dB(A) at benefited receptor sites with a maximum reduction of 8.9 dB(A). The estimated construction cost of this conceptual barrier design is $959,200 or $63,947 per benefited receptor site which meets the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site.

Conceptual Noise Barrier Design TPS-CD5 is recommended for further consideration and public input during the project's design phase at this location (CNE S3.1). This conceptual noise barrier design satisfies the reasonableness and feasibility factors considered in the evaluation of noise abatement measures during a PD&E Study. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review will be conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited receptors is determined.

3.5 Common Noise Environment S4.1 (Windward Ranch)

Common Noise Environment S4.1 encompasses the impacted single family residences within the Windward Ranch Community located south of SR 16 and east of Windward Ranch Boulevard to west of Whisper Ridge Drive (see **Figure 3.1 Sheet 8**). Design year (2050) noise levels for the Build Alternative are predicted to approach, meet, or exceed the NAC at four residences within this area; therefore, noise barriers were evaluated at this location as an abatement measure. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area.

The results of the noise barrier analysis for this area are summarized in **Table 3.6**. Three conceptual right-of-way ground mounted noise barrier designs (WR-CD1 through WR-CD3) were evaluated to reduce traffic noise levels at five impacted receptors. All three of the conceptual noise barrier designs meet the minimum noise reduction design goal of 7 dB(A) for at least one

benefited receptor. However, none meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site. The lowest cost conceptual design (WR-CD1) is $90,000 per benefited receptor which exceeds the reasonableness cost criteria. The high cost of providing noise abatement at this location is attributed to the low number of residential sites (i.e., five) impacted and benefited. Therefore, noise barriers were not recommended for further consideration during the project's design phase at this location (CNE S4.1).

3.6 Common Noise Environment S4.2 (Soluna Apartments)

Common Noise Environment S4.2 encompasses the impacted multi-family residences within the Soluna Apartments located south of SR 16 and east of Amber Sun Way (see **Figure 3.1 Sheet 9**). Design year (2050) noise levels for the Build Alternative are predicted to approach, meet, or exceed the NAC at 20 residences within this area; therefore, noise barriers were evaluated at this location as an abatement measure. Noise barriers were offset from the right-of-way line by 20 feet to provide access for future maintenance and minimize impacting an overhead electric transmission line and poles on the west side of SR 16. In addition, the entrance road into this community and the proposed improvement limits the ability to have a continuous noise barrier at this location. Currently, no existing, conforming and legally permitted outdoor advertising signs are located in this area.

The results of the noise barrier analysis for this area are summarized in **Table 3.7**. Five conceptual right-of-way ground mounted noise barrier designs (SA-CD1 through SA-CD5) were evaluated to reduce traffic noise levels at the 20 impacted receptors. Although all of the conceptual noise barrier designs meet the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site, only two of the conceptual noise barrier designs (i.e., SA-CD5 and SA-CD4) meet the minimum noise reduction design goal of 7 dB(A) for at least one benefited receptor. Conceptual barrier design SA-CD5 was determined to be the most feasible and cost reasonable noise abatement measure for this location.

Conceptual Barrier Design SA-CD5 represents two 22-foot-tall right-of-way ground mounted noise barrier segments. The first barrier segment extends approximately 280 feet, from Station

350+00 to Station 352+80. The second barrier segment extends approximately 760 feet, from Station 354+40 to Station 362+00. This conceptual noise barrier design would benefit 55 receptors, including 19 of the 20 impacted receptors, and would provide an average noise reduction of 7.5 dB(A) at benefited receptor sites with a maximum reduction of 8.9 dB(A). The estimated construction cost of this conceptual barrier design is $915,200 or $16,640 per benefited receptor site which meets the reasonable cost criteria of equal to or less than $64,000 per benefited receptor site.

Conceptual Noise Barrier Design SA-CD5 is recommended for further consideration and public input during the project's design phase at this location (CNE S4.2). This conceptual noise barrier design satisfies the reasonableness and feasibility factors considered in the evaluation of noise abatement measures during a PD&E Study. The final decisions on noise barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review will be conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited receptors is determined.

4.0 Conclusions

A traffic noise study was performed in accordance with 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2010), the FDOT's PD&E Manual, Part 2, Chapter 18, Highway Traffic Noise (July 31, 2024), and FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook (December 31, 2018). Design year (2050) traffic noise levels for the Build Alternative will approach or exceed the NAC at 47 residences and a recreational area associated with Adventure Landing, an isolated non-residential/special land use site (NAC C) within the project limits. Therefore, the feasibility and reasonableness of noise barriers were considered for those noise sensitive sites predicted to be impacted by design year (2050) traffic noise. Noise barriers were not considered a feasible noise abatement option at thirteen of the 47 impacted residences because they represent isolated residences. For a noise barrier to be considered an acoustically feasible abatement measure, it must benefit at least two impacted receptor sites. In addition, noise barriers were not determined to be a reasonable and feasible abatement measure for the recreational area associated with Adventure Landing. Due to the type of recreational area in Adventure Landing (i.e., mini-golf course), it's reasonable to assume that the usage would not be more than 45,026 person-hours per year. An isolated impacted SLU must have enough person-hour usage to equate to at least two equivalent residences to be found feasible.

Noise barriers were evaluated for the other 34 residences that approach or exceed the NAC. Four separate CNEs were used to assess noise barriers at these locations. The results of the noise barrier analyses for each of these CNEs are summarized in **Table 4.1** as well as in **Sections 3.3** through **3.6**. Noise barriers at three of four CNEs were determined to be feasible and cost reasonable and are recommended for further consideration during the design phase and public input. The cost per benefited receptor of these four conceptual noise barrier designs are within FDOT's noise barrier cost criteria of equal to or less than $64,000 per benefited receptor and they meet FDOT's noise reduction reasonableness criteria of 7 dB(A) at one or more impacted sites. The three noise barriers recommended for further consideration are expected to reduce traffic noise by at least 5 dB(A) at 84 residences within these four CNEs including 33 of the 38 impacted sites. The estimated cost of the recommended barriers is $2,754,400. The final decisions on noise

barrier dimensions are made during the project's design phase. During the design phase, an engineering constructability review will be conducted to confirm that the noise barrier is feasible and support for noise barriers from the benefited noise sensitive sites is determined.

Noise barriers were not found to be feasible or cost reasonable at CNE S4.1 that includes five impacted residences. The cost to provide noise abatement at five impacted residences in CNE S4.1 exceeded FDOT's noise barrier cost criteria of equal to or less than $64,000 per benefited receptor. Therefore, noise barriers are not recommended for public input, design, or construction at CNEs S4.1.

The No-Build alternative would result in impacts to seven receptors, as detailed in **Table 3.2**. With the Build Alternative, 18 of the 47 impacted residences and three of the 30 impacted receptor sites within Adventure Landing would not be benefited by the noise barriers recommended for further consideration in the design phase. Thirteen of the 18 impacted residences are isolated where noise barriers were not determined to be a feasible noise abatement option. For a noise barrier to be considered an acoustically feasible abatement measure, it must benefit at least two impacted receptor sites. Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at these noise sensitive sites. Therefore, impacts to these 23 residential noise sensitive sites and to the recreational areas (i.e., mini-golf course) associated with Adventure Landing are unavoidable consequences of the project.

Statement of Likelihood

FDOT is committed to the construction of feasible noise abatement measures at the noise impacted locations identified in **Table 4.1** and **Figure 3.1** contingent upon the following conditions:

- Final recommendations on the construction of abatement measures are determined during the project's final design and through the public involvement process;
- Detailed noise analyses during the final design process support the need, feasibility and reasonableness of providing abatement;
- Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
- Community input supporting types, heights, and locations of the noise barrier(s) is provided to the County; and
- Safety and engineering aspects, as related to the roadway user and the adjacent property owner, have been reviewed, and any conflicts or issues resolved.

Table 4.1: Noise Barrier Evaluation Summary and Recommendations (Sheet 1 of 1)

Name	Common Noise Environment (CNE) Identification Number	Conceptual Noise Barrier Design Number (Type)	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Number of Impacted/ Benefited Receptor Sites	Number of Benefited Receptor Sites/ Not Impacted	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites dB(A)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost ($40 per square foot)	Average Cost/Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of $64,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Noise Barrier Recommended for Further Consideration and Public Input?	Comments
SR 16 PD&E Study From International Golf Parkway to I-95																	
Sevilla Community	CNE S2.1	SC-CD5	22	1000	158+00	168+00	6	6	8	14	9.0	11.7	$880,000	$62,857	YES	YES	Conceptual Barrier Design PL-CD5 recommended for further consideration and public input.
Tomoka Pines Subdivision	CNE S3.1	TPS-CD5	22	500	277+00	282+00	8	8	7	15	7.0	8.9	$959,200	$63,947	YES	YES	Conceptual Barrier Design TPS-CD5 recommended for further consideration and public input.
			22	370	283+60	287+30											
			22	220	287+80	291+00											
Windward Ranch	CNE S4.1	WR-CD1	18	500	326+00	331+00	4	4	0	4	7.5	7.9	$360,000	$90,000	NO	NO	---
Soluna Apartments	CNE S4.2	SA-CD5	22	280	350+00	352+80	20	19	36	55	7.5	8.9	$915,200	$16,640	YES	YES	Conceptual Barrier Design SA-CD5 recommended for further consideration and public input.
			22	760	354+40	362+00											

X:\P\Noise_Studies\SR 16 PD&E Study\NSR\2025 NSR\Tables\[Tables_3-4&4-1_SR16_NoiseBarrierAnalysis&Summary_1-14-25.xlsx]SA_BA_8-27

5.0 Construction Noise And Vibration

During construction of the project, there is the potential for noise impacts to be greater than those resulting from normal traffic operations because heavy equipment is typically used to build roadways. In addition, construction activities may result in vibration impacts. Therefore, early identification of potential noise/vibration sensitive sites along the project corridor is important in minimizing noise and vibration impacts. The project area does include residential, commercial, and institutional land uses. Construction related noise and vibration impacts to these sites will be minimized by adherence to the controls listed in the latest edition of the FDOT's Standard Specifications for Road and Bridge Construction. A reassessment of the project corridor for sites particularly sensitive to construction noise and/or vibration will be performed during the final design phase to ensure that impacts to such sites are minimized.

6.0 Community Coordination

Coordination with local agencies and officials has been accomplished during the development of this project. In addition, local and community officials have had the opportunity to comment on the proposed project at the public meetings.

To aid in promoting land use compatibility, a copy of the Noise Study Report, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise levels, will be provided to St. Johns County. In addition, generalized future noise impact contours for the properties in the immediate vicinity of the project have been developed for Noise Abatement Activity Categories B/C and E (i.e., residential and other sensitive land uses, and sensitive commercial land uses, respectively). These contours represent the approximate distance from the edge of the nearest proposed travel lane of IGP to the limits of the area predicted to approach [i.e., within 1 dB(A)] the NAC in the design year (2050). The contours do not consider any shielding of noise provided by structures between the receptor and the proposed travel lanes. Within the project corridor, the distance between the proposed edge of the outside travel lane and the contour at various locations are presented in **Table 6.1**. To minimize the potential for incompatible land use, noise sensitive land uses should be located beyond this distance.

Table 6.1: – Design Year (2050) Noise Impact Contour Distances

Location / Range	Distance from Proposed Nearest Travel Lane to Noise Contour (Feet)	
	66 dB(A) - Activity Category B/C	71 dB(A) - Activity Category E
SR 16 - East of International Golf Parkway (45 mph)	90	35
SR 16 - West of South Francis Road (55 mph)	135	56
SR 16 - Between Turnbull Drive to Turnbull Creek Road (55 mph)	138	58
SR 16 - Between Turnbull Creek Road to Whisper Ridge Drive (55 mph)	144	61
SR 16 - Between Whisper Ridge Drive to I-95 (45 mph)	91	36

7.0 References

23 CFR Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010.

Federal Highway Administration Report FHWA-HEP-10-025, "Highway Traffic Noise: Analysis and Abatement Guidance", June 2010 (revised December 2010).

Federal Highway Administration Report FHWA-PD-96-009, "FHWA Traffic Noise Model, Version 1.0 User's Guide", January 1998 + supplements.

Federal Highway Administration Report FHWA-HEP-18-065, "Noise Measurement Handbook - Final Report", June 2018.

Federal Highway Administration Report FHWA-HEP-06-015, "Construction Noise Handbook: Final Report", August 2006.

Florida Department of Transportation. Methodology to Evaluate Highway Traffic Noise at Special Land Uses, January 2024

Florida Department of Transportation. "Highway Traffic Noise", Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 31, 2024.

Florida Department of Transportation. "2024 Design Manual" (Topic No. 625-000-002, Part 2, Section 264, Noise Walls and Perimeter Walls).

Florida Department of Transportation "Standard Specifications for Road and Bridge Construction" FY 2024-25.

Florida Department of Transportation "Traffic Noise Modeling and Analysis Practitioners Handbook", December 31, 2018

Appendix A

Noise Analysis Traffic Data Tables

These columns below should be provided in the Noise Study Report as an Appendix.
If additional rowas are needed for additional traffic segments, **Traffic Segment Numbers** (Column A) should be provided for each roadway segment.

Highway Traffic Noise: Traffic Data

Project Name	**SR 16 PD&E from IGP/Pacetti Road to I-95**
Project Number	**210447-5-32-01**
Condition	**Existing**
Year	**2023**

	Roadway Details					Traffic Details									
Traffic Segment Number	Roadway Name	From	To	Roadway Type	Number of Lanes (in 1 direction)	LOS C Peak Hour	AM Peak Hour	PM Peak Hour	Demand Hourly Volumes (DHV)	% Automobiles	% Medium Trucks	% Heavy Trucks	% Buses	% Motorcycles	Posted Speed (mph)
1	SR 16	West of IGP/Pacetti Rd	IGP/Pacetti Rd	Arterial	2	1,520	923	998	998	95.8%	1.5%	1.9%	0.6%	0.2%	45
2	SR 16	IGP/Pacetti Rd	West of IGP/Pacetti Rd	Arterial	2	1,520	783	1,198	1,198	95.8%	1.5%	1.9%	0.6%	0.2%	45
3	SR 16	IGP/Pacetti Rd	Murabella Pkwy	Arterial	1	760	734	798	798	95.8%	1.5%	1.9%	0.6%	0.2%	45
4	SR 16	Murabella Pkwy	IGP/Pacetti Rd	Arterial	1	760	527	515	527	95.8%	1.5%	1.9%	0.6%	0.2%	45
5	SR 16	Murabella Pkwy	Verona Way	Arterial	1	760	897	695	897	95.8%	1.5%	1.9%	0.6%	0.2%	55
6	SR 16	Verona Way	Murabella Pkwy	Arterial	1	760	618	726	726	95.8%	1.5%	1.9%	0.6%	0.2%	55
7	SR 16	Verona Way	San Giacomo Rd	Arterial	1	760	994	714	994	95.8%	1.5%	1.9%	0.6%	0.2%	60
8	SR 16	San Giacomo Rd	Verona Way	Arterial	1	760	618	726	726	95.8%	1.5%	1.9%	0.6%	0.2%	60
9	SR 16	San Giacomo Rd	S Francis Rd	Arterial	1	430	899	713	899	95.8%	1.5%	1.9%	0.6%	0.2%	60
10	SR 16	S Francis Rd	San Giacomo Rd	Arterial	1	430	612	813	813	95.8%	1.5%	1.9%	0.6%	0.2%	60
11	SR 16	S Francis Rd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	1	430	887	781	887	95.8%	1.5%	1.9%	0.6%	0.2%	60
12	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	S Francis Rd	Arterial	1	430	725	958	958	95.8%	1.5%	1.9%	0.6%	0.2%	60
13	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	Windward Ranch Blvd	Arterial	1	430	867	743	867	95.8%	1.5%	1.9%	0.6%	0.2%	60
14	SR 16	Windward Ranch Blvd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	1	430	725	909	909	95.8%	1.5%	1.9%	0.6%	0.2%	60
15	SR 16	Windward Ranch Blvd	Whisper Ridge Dr	Arterial	1	760	941	708	941	95.8%	1.5%	1.9%	0.6%	0.2%	60
16	SR 16	Whisper Ridge Dr	Windward Ranch Blvd	Arterial	1	760	644	962	962	95.8%	1.5%	1.9%	0.6%	0.2%	60
17	SR 16	Whisper Ridge Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	1	760	970	667	970	95.8%	1.5%	1.9%	0.6%	0.2%	45
18	SR 16	Elevation Pkwy/West Outlet Mall Access	Whisper Ridge Dr	Arterial	1	760	602	970	970	95.8%	1.5%	1.9%	0.6%	0.2%	45
19	SR 16	Elevation Pkwy/West Outlet Mall Access	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	957	776	957	95.8%	1.5%	1.9%	0.6%	0.2%	45
20	SR 16	Toms Rd/Factory Outlets Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	2	1,520	626	1,060	1,060	95.8%	1.5%	1.9%	0.6%	0.2%	45
21	SR 16	Toms Rd/Factory Outlets Dr	CR 208	Arterial	2	1,520	1,065	988	1,065	95.8%	1.5%	1.9%	0.6%	0.2%	45
22	SR 16	CR 208	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	662	1,133	1,133	95.8%	1.5%	1.9%	0.6%	0.2%	45
23	SR 16	CR 208	I-95 SB On/Off-Ramp	Arterial	2	1,520	1,454	1,269	1,454	95.8%	1.5%	1.9%	0.6%	0.2%	45
24	SR 16	I-95 SB On/Off-Ramp	CR 208	Arterial	2	1,520	963	1,459	1,459	95.8%	1.5%	1.9%	0.6%	0.2%	45
25	SR 16	I-95 SB On/Off-Ramp	East of I-95 SB On/Off-Ramp	Arterial	2	1,520	1,821	1,619	1,821	95.8%	1.5%	1.9%	0.6%	0.2%	45
26	SR 16	East of I-95 SB On/Off-Ramp	I-95 SB On/Off-Ramp	Arterial	2	1,520	981	1,574	1,574	95.8%	1.5%	1.9%	0.6%	0.2%	45
27	IGP	North of SR 16	SR 16	Arterial	2	1,520	766	1,485	1,485	95.8%	1.5%	1.9%	0.6%	0.2%	35
28	Pacetti Rd	South of SR 16	SR 16	Arterial	2	1,520	949	903	949	95.8%	1.5%	1.9%	0.6%	0.2%	45
29	Murabella Pkwy	South of SR 16	SR 16	Other	1	760	286	152	286	95.8%	1.5%	1.9%	0.6%	0.2%	25
30	Murabella Pkwy	SR 16	South of SR 16	Other	1	760	213	476	476	95.8%	1.5%	1.9%	0.6%	0.2%	25
31	I-95 SB Ramp	I-95	SR 16	Ramp	1	1,340	794	880	880	95.8%	1.5%	1.9%	0.6%	0.2%	45
32	I-95 SB Ramp	SR 16	I-95	Ramp	1	1,340	445	645	645	95.8%	1.5%	1.9%	0.6%	0.2%	45

Notes: Arterial LOS C volumes obtained from Appendix B of FDOT's Multimodal Quaility/Level of Service Handbook (2023) and volume adjustments have been applied as appropriate. Vehicle split percentages calculated based on Classification Counts and a 4% Hourly Truck Percentage from the Project Traffic Analysis Report.

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: **Shawn C. Birst, PE, PTOE**

Shawn C Birst Date: 2024.07.16 18:23:11 -04'00'

Signature

Date: 7/16/2024

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis.

FDOT Reviewer: David Tyler

DocuSigned by:

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Signature

Date: 07/26/2024 | 10:2

These columns below should be provided in the Noise Study Report as an Appendix.
If additional rowas are needed for additional traffic segments, **Traffic Segment Numbers** (Column A) should be provided for each roadway segment.

Highway Traffic Noise: Traffic Data

Project Name	**SR 16 PD&E from IGP/Pacetti Road to I-95**
Project Number	**210447-5-32-01**
Condition	**No-Build**
Year	**2050**

	Roadway Details					Traffic Details									
Traffic Segment Number	Roadway Name	**From**	**To**	**Roadway Type**	**Number of Lanes (in 1 direction)**	**LOS C Peak Hour**	**AM Peak Hour**	**PM Peak Hour**	**Demand Hourly Volumes (DHV)**	**% Automobiles**	**% Medium Trucks**	**% Heavy Trucks**	**% Buses**	**% Motorcycles**	**Posted Speed (mph)**
1	SR 16	West of IGP/Pacetti Rd	IGP/Pacetti Rd	Arterial	2	1,520	1,665	1,620	1,665	95.8%	1.5%	1.9%	0.6%	0.2%	45
2	SR 16	IGP/Pacetti Rd	West of IGP/Pacetti Rd	Arterial	2	1,520	1,515	2,440	2,440	95.8%	1.5%	1.9%	0.6%	0.2%	45
3	SR 16	IGP/Pacetti Rd	Murabella Pkwy	Arterial	2	1,596	1,325	1,265	1,325	95.8%	1.5%	1.9%	0.6%	0.2%	45
4	SR 16	Murabella Pkwy	IGP/Pacetti Rd	Arterial	2	1,596	1,050	1,210	1,210	95.8%	1.5%	1.9%	0.6%	0.2%	45
5	SR 16	Murabella Pkwy	Verona Way	Arterial	2	1,596	1,535	1,135	1,535	95.8%	1.5%	1.9%	0.6%	0.2%	55
6	SR 16	Verona Way	Murabella Pkwy	Arterial	2	1,596	1,165	1,475	1,475	95.8%	1.5%	1.9%	0.6%	0.2%	55
7	SR 16	Verona Way	San Giacomo Rd	Arterial	2	1,596	1,660	1,160	1,660	95.8%	1.5%	1.9%	0.6%	0.2%	55
8	SR 16	San Giacomo Rd	Verona Way	Arterial	2	1,596	1,165	1,495	1,495	95.8%	1.5%	1.9%	0.6%	0.2%	55
9	SR 16	San Giacomo Rd	CR 2209	Arterial	2	1,596	1,550	1,110	1,550	95.8%	1.5%	1.9%	0.6%	0.2%	55
10	SR 16	CR 2209	San Giacomo Rd	Arterial	2	1,596	1,110	1,550	1,550	95.8%	1.5%	1.9%	0.6%	0.2%	55
11	SR 16	CR 2209	S Francis Rd	Arterial	1	608	2,120	1,925	2,120	95.8%	1.5%	1.9%	0.6%	0.2%	60
12	SR 16	S Francis Rd	CR 2209	Arterial	1	608	1,990	2,055	2,055	95.8%	1.5%	1.9%	0.6%	0.2%	60
13	SR 16	S Francis Rd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	1	608	2,000	1,660	2,000	95.8%	1.5%	1.9%	0.6%	0.2%	60
14	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	S Francis Rd	Arterial	1	608	1,660	2,000	2,000	95.8%	1.5%	1.9%	0.6%	0.2%	60
15	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	Windward Ranch Blvd	Arterial	1	798	1,945	1,410	1,945	95.8%	1.5%	1.9%	0.6%	0.2%	60
16	SR 16	Windward Ranch Blvd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	1	798	1,510	1,835	1,835	95.8%	1.5%	1.9%	0.6%	0.2%	60
17	SR 16	Windward Ranch Blvd	Whisper Ridge Dr	Arterial	1	638	1,870	1,245	1,870	95.8%	1.5%	1.9%	0.6%	0.2%	60
18	SR 16	Whisper Ridge Dr	Windward Ranch Blvd	Arterial	1	638	1,415	1,740	1,740	95.8%	1.5%	1.9%	0.6%	0.2%	60
19	SR 16	Whisper Ridge Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	1	608	1,735	1,200	1,735	95.8%	1.5%	1.9%	0.6%	0.2%	45
20	SR 16	Elevation Pkwy/West Outlet Mall Access	Whisper Ridge Dr	Arterial	1	608	1,365	1,605	1,605	95.8%	1.5%	1.9%	0.6%	0.2%	45
21	SR 16	Elevation Pkwy/West Outlet Mall Access	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	2,005	1,525	2,005	95.8%	1.5%	1.9%	0.6%	0.2%	45
22	SR 16	Toms Rd/Factory Outlets Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	2	1,520	1,525	2,030	2,030	95.8%	1.5%	1.9%	0.6%	0.2%	45
23	SR 16	Toms Rd/Factory Outlets Dr	CR 208	Arterial	2	1,520	2,165	1,830	2,165	95.8%	1.5%	1.9%	0.6%	0.2%	45
24	SR 16	CR 208	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	1,590	2,200	2,200	95.8%	1.5%	1.9%	0.6%	0.2%	45
25	SR 16	CR 208	I-95 SB On/Off-Ramp	Arterial	2	1,520	2,805	2,320	2,805	95.8%	1.5%	1.9%	0.6%	0.2%	45
26	SR 16	I-95 SB On/Off-Ramp	CR 208	Arterial	2	1,520	2,135	2,730	2,730	95.8%	1.5%	1.9%	0.6%	0.2%	45
27	SR 16	I-95 SB On/Off-Ramp	East of I-95 SB On/Off-Ramp	Arterial	2	1,520	3,370	2,860	3,370	95.8%	1.5%	1.9%	0.6%	0.2%	45
28	SR 16	East of I-95 SB On/Off-Ramp	I-95 SB On/Off-Ramp	Arterial	2	1,520	2,160	2,905	2,905	95.8%	1.5%	1.9%	0.6%	0.2%	45
29	IGP	North of SR 16	SR 16	Arterial	2	1,436	1,390	2,690	2,690	95.8%	1.5%	1.9%	0.6%	0.2%	35
30	Pacetti Rd	South of SR 16	SR 16	Arterial	2	1,436	1,715	1,635	1,715	95.8%	1.5%	1.9%	0.6%	0.2%	45
31	Murabella Pkwy	South of SR 16	SR 16	Other	1	608	365	195	365	95.8%	1.5%	1.9%	0.6%	0.2%	25
32	Murabella Pkwy	SR 16	South of SR 16	Other	1	608	270	605	605	95.8%	1.5%	1.9%	0.6%	0.2%	25
33	I-95 SB Ramp	I-95	SR 16	Ramp	1	1,340	1,225	1,355	1,355	95.8%	1.5%	1.9%	0.6%	0.2%	45
34	I-95 SB Ramp	SR 16	I-95	Ramp	1	1,340	465	530	530	95.8%	1.5%	1.9%	0.6%	0.2%	45

Notes: Arterial LOS C volumes obtained from Appendix B of FDOT's Multimodal Quaility/Level of Service Handbook (2023) and volume adjustments have been applied as appropriate. Vehicle split percentages calculated based on Classification Counts and a 4% Hourly Truck Percentage from the Project Traffic Analysis Report.

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: **Shawn C. Birst, PE, PTOE**

Shawn C Birst Date: 2024.07.16 18:24:10 -04'00'

Signature

Date: 7/16/2024

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis.

FDOT Reviewer: David Tyler

DocuSigned by:

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Signature

Date: 07/26/2024 | 10:2

These columns below should be provided in the Noise Study Report as an Appendix.
If additional rowas are needed for additional traffic segments, **Traffic Segment Numbers** (Column A) should be provided for each roadway segment.

Highway Traffic Noise: Traffic Data

Project Name	**SR 16 PD&E from IGP/Pacetti Road to I-95**
Project Number	**210447-5-32-01**
Condition	**Build**
Year	**2050**

	Roadway Details					Traffic Details									
Traffic Segment Number	Roadway Name	From	To	Roadway Type	Number of Lanes (in 1 direction)	LOS C Peak Hour Peak	AM Peak Hour	PM Peak Hour	Demand Hourly Volumes (DHV)	% Automobiles	% Medium Trucks	% Heavy Trucks	% Buses	% Motorcycles	Posted Speed (mph)
1	SR 16	West of IGP/Pacetti Rd	IGP/Pacetti Rd	Arterial	2	1,520	1,665	1,620	1,665	95.8%	1.5%	1.9%	0.6%	0.2%	45
2	SR 16	IGP/Pacetti Rd	West of IGP/Pacetti Rd	Arterial	2	1,520	1,515	2,440	2,440	95.8%	1.5%	1.9%	0.6%	0.2%	45
3	SR 16	IGP/Pacetti Rd	Murabella Pkwy	Arterial	2	1,596	1,325	1,265	1,325	95.8%	1.5%	1.9%	0.6%	0.2%	45
4	SR 16	Murabella Pkwy	IGP/Pacetti Rd	Arterial	2	1,596	1,050	1,210	1,210	95.8%	1.5%	1.9%	0.6%	0.2%	45
5	SR 16	Murabella Pkwy	Verona Way	Arterial	2	1,596	1,535	1,135	1,535	95.8%	1.5%	1.9%	0.6%	0.2%	45
6	SR 16	Verona Way	Murabella Pkwy	Arterial	2	1,596	1,165	1,475	1,475	95.8%	1.5%	1.9%	0.6%	0.2%	45
7	SR 16	Verona Way	San Giacomo Rd	Arterial	2	1,596	1,690	1,205	1,690	95.8%	1.5%	1.9%	0.6%	0.2%	45
8	SR 16	San Giacomo Rd	Verona Way	Arterial	2	1,596	1,365	1,565	1,565	95.8%	1.5%	1.9%	0.6%	0.2%	45
9	SR 16	San Giacomo Rd	CR 2209	Arterial	2	1,596	1,550	1,110	1,550	95.8%	1.5%	1.9%	0.6%	0.2%	45
10	SR 16	CR 2209	San Giacomo Rd	Arterial	2	1,596	1,110	1,550	1,550	95.8%	1.5%	1.9%	0.6%	0.2%	45
11	SR 16	CR 2209	S Francis Rd	Arterial	2	1,520	2,120	1,925	2,120	95.8%	1.5%	1.9%	0.6%	0.2%	55
12	SR 16	S Francis Rd	CR 2209	Arterial	2	1,520	1,990	2,055	2,055	95.8%	1.5%	1.9%	0.6%	0.2%	55
13	SR 16	S Francis Rd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	2	1,520	2,095	1,910	2,095	95.8%	1.5%	1.9%	0.6%	0.2%	55
14	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	S Francis Rd	Arterial	2	1,520	1,970	2,035	2,035	95.8%	1.5%	1.9%	0.6%	0.2%	55
15	SR 16	Turnbull Creek Rd/Tomoka Pines Dr	Windward Ranch Blvd	Arterial	2	1,596	1,990	1,620	1,990	95.8%	1.5%	1.9%	0.6%	0.2%	55
16	SR 16	Windward Ranch Blvd	Turnbull Creek Rd/Tomoka Pines Dr	Arterial	2	1,596	1,560	1,985	1,985	95.8%	1.5%	1.9%	0.6%	0.2%	55
17	SR 16	Windward Ranch Blvd	Whisper Ridge Dr	Arterial	2	1,596	1,870	1,245	1,870	95.8%	1.5%	1.9%	0.6%	0.2%	55
18	SR 16	Whisper Ridge Dr	Windward Ranch Blvd	Arterial	2	1,596	1,415	1,740	1,740	95.8%	1.5%	1.9%	0.6%	0.2%	55
19	SR 16	Whisper Ridge Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	2	1,596	1735	1200	1,735	95.8%	1.5%	1.9%	0.6%	0.2%	45
20	SR 16	Elevation Pkwy/West Outlet Mall Access	Whisper Ridge Dr	Arterial	2	1,596	1365	1605	1,605	95.8%	1.5%	1.9%	0.6%	0.2%	45
21	SR 16	Elevation Pkwy/West Outlet Mall Access	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	2145	1760	2,145	95.8%	1.5%	1.9%	0.6%	0.2%	45
22	SR 16	Toms Rd/Factory Outlets Dr	Elevation Pkwy/West Outlet Mall Access	Arterial	2	1,520	1665	2265	2,265	95.8%	1.5%	1.9%	0.6%	0.2%	45
23	SR 16	Toms Rd/Factory Outlets Dr	CR 208	Arterial	2	1,520	2225	1875	2,225	95.8%	1.5%	1.9%	0.6%	0.2%	45
24	SR 16	CR 208	Toms Rd/Factory Outlets Dr	Arterial	2	1,520	1620	2295	2,295	95.8%	1.5%	1.9%	0.6%	0.2%	45
25	SR 16	CR 208	I-95 SB On/Off-Ramp	Arterial	2	1,520	2805	2320	2,805	95.8%	1.5%	1.9%	0.6%	0.2%	45
26	SR 16	I-95 SB On/Off-Ramp	CR 208	Arterial	2	1,520	2135	2730	2,730	95.8%	1.5%	1.9%	0.6%	0.2%	45
27	SR 16	I-95 SB On/Off-Ramp	East of I-95 SB On/Off-Ramp	Arterial	2	1,520	3370	2860	3,370	95.8%	1.5%	1.9%	0.6%	0.2%	45
28	SR 16	East of I-95 SB On/Off-Ramp	I-95 SB On/Off-Ramp	Arterial	2	1,520	2160	2905	2,905	95.8%	1.5%	1.9%	0.6%	0.2%	45
29	IGP	North of SR 16	SR 16	Arterial	2	1,436	1390	2,690	2,690	95.8%	1.5%	1.9%	0.6%	0.2%	35
30	Pacetti Rd	South of SR 16	SR 16	Arterial	2	1,436	1,715	1635	1,715	95.8%	1.5%	1.9%	0.6%	0.2%	45
31	Murabella Pkwy	South of SR 16	SR 16	Other	1	608	365	195	365	95.8%	1.5%	1.9%	0.6%	0.2%	25
32	Murabella Pkwy	SR 16	South of SR 16	Other	1	608	270	605	605	95.8%	1.5%	1.9%	0.6%	0.2%	25
33	I-95 SB Ramp	I-95	SR 16	Ramp	1	1,340	1225	1355	1,355	95.8%	1.5%	1.9%	0.6%	0.2%	45
34	I-95 SB Ramp	SR 16	I-95	Ramp	1	1,340	465	530	530	95.8%	1.5%	1.9%	0.6%	0.2%	45

Notes: Arterial LOS C volumes obtained from Appendix B of FDOT's Multimodal Quaility/Level of Service Handbook (2023) and volume adjustments have been applied as appropriate. Vehicle split percentages calculated based on Classification Counts and a 4% Hourly Truck Percentage from the Project Traffic Analysis Report.

I certify that the above information is accurate and appropriate for use with the traffic noise analysis.

Prepared By: **Shawn C. Birst, PE, PTOE**

Shawn C Birst Date: 2024.07.16 18:24:36 -04'00'

Signature

Date: 7/16/2024

I have reviewed and concur that the above information is appropriate for use with the traffic noise analysis.

FDOT Reviewer: David Tyler

DocuSigned by:

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Signature

Date: 07/26/2024 | 10:

Appendix B

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 1 of 5)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)			Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	Common Noise Environment (CNE) Identification Number (Comments)
					Existing Conditions	Design Year (2050)					
						No-Build Alternative	Build Alternative				
SR 16 PD&E Study from International Golf Parkway to I-95											
NSA 1 - See Figure 3.2 Sheets 1 and 2											
SR 16 from West of International Golf Parkway/Pacetti Road to Winners Way	OWC-1	Medical Facilities	1	Institutional Interior NAC D - 51 dB(A)	36.5	35.6	36.6	Below / No	-0.9	0.1	---
	OWC-2	Medical Facilities	1		32.8	29.6	32.9	Below / No	-3.2	0.1	---
	MCA-1	School	1		29.6	30.3	30.8	Below / No	0.7	1.2	---
	VC-1	Church	1		29.2	30.8	31.0	Below / No	1.6	1.8	---
	PD-1	Medical Facilities	1		33.6	35.3	35.3	Below / No	1.7	1.7	---
	MCD-1	Restaurant	1	Commerical NAC E - 71 dB(A)	59.5	61.9	61.0	Below / No	2.4	1.5	---
	CMR-1	Restaurant	1		62.4	65.3	61.8	Below / No	2.9	-0.6	---
	FAC-1	School	1	Institutional Interior NAC D - 51 dB(A)	37.1	40.0	36.0	Below / No	2.9	-1.1	---
	FAC-2	School	1	Institutional Exterior NAC C - 66 dB(A)	45.9	48.1	47.5	Below / No	2.2	1.6	---
	MSR-1	Restaurant	1	Commerical NAC E - 71 dB(A)	61.7	64.6	61.6	Below / No	2.9	-0.1	---
	CBG-1	Restaurant	1		61.7	64.6	61.6	Below / No	2.9	-0.1	---
	CCA-1.1	Multi-Family Residence	1	Residential NAC B - 66 dB(A)	55.7	58.4	57.0	Below / No	2.7	1.3	---
	CCA-1.2	Multi-Family Residence	1		59.1	61.7	61.0	Below / No	2.6	1.9	---
	CCA-1.3	Multi-Family Residence	1		60.9	63.6	62.5	Below / No	2.7	1.6	---
	CCA-2.1	Multi-Family Residence	1		55.9	58.6	57.2	Below / No	2.7	1.3	---
	CCA-2.2	Multi-Family Residence	1		59.2	62.0	61.2	Below / No	2.8	2.0	---
	CCA-2.3	Multi-Family Residence	1		61.2	63.9	62.7	Below / No	2.7	1.5	---
	CCA-3.1	Multi-Family Residence	1		56.1	58.9	57.4	Below / No	2.8	1.3	---
	CCA-3.2	Multi-Family Residence	1		59.5	62.2	61.4	Below / No	2.7	1.9	---
	CCA-3.3	Multi-Family Residence	1		61.5	64.2	63.0	Below / No	2.7	1.5	---
	CCA-4.1	Multi-Family Residence	1		56.5	59.2	57.7	Below / No	2.7	1.2	---
	CCA-4.2	Multi-Family Residence	1		60.0	62.7	61.7	Below / No	2.7	1.7	---
	CCA-4.3	Multi-Family Residence	1		61.9	64.5	63.3	Below / No	2.6	1.4	---
	CCA-5.1	Multi-Family Residence	1		56.8	59.4	58.1	Below / No	2.6	1.3	---
	CCA-5.2	Multi-Family Residence	1		60.4	63.0	62.0	Below / No	2.6	1.6	---
	CCA-5.3	Multi-Family Residence	1		62.3	64.9	63.6	Below / No	2.6	1.3	---
	CCA-6.1	Multi-Family Residence	1		57.1	59.7	58.3	Below / No	2.6	1.2	---
	CCA-6.2	Multi-Family Residence	1		60.8	63.3	62.3	Below / No	2.5	1.5	---
	CCA-6.3	Multi-Family Residence	1		62.6	65.1	63.9	Below / No	2.5	1.3	---
	CCA-7.1	Multi-Family Residence	1		57.5	60.0	58.7	Below / No	2.5	1.2	---
	CCA-7.2	Multi-Family Residence	1		61.1	63.6	62.7	Below / No	2.5	1.6	---
	CCA-7.3	Multi-Family Residence	1		63.0	65.5	64.2	Below / No	2.5	1.2	---
	CCA-8.1	Multi-Family Residence	1		58.0	60.4	59.1	Below / No	2.4	1.1	---
	CCA-8.2	Multi-Family Residence	1		61.5	63.8	63.0	Below / No	2.3	1.5	---
	CCA-8.3	Multi-Family Residence	1		63.5	65.8	64.5	Below / No	2.3	1.0	---
	CCA-9.1	Multi-Family Residence	1		58.3	60.7	59.5	Below / No	2.4	1.2	---
	CCA-9.2	Multi-Family Residence	1		61.8	64.1	63.3	Below / No	2.3	1.5	---
	CCA-9.3	Multi-Family Residence	1		63.8	**66.1**	64.8	Below / No	2.3	1.0	---
	MBS-1	Single Family Residence	1		52.1	54.5	53.1	Below / No	2.4	1.0	---
	MBS-2	Single Family Residence	1		53.4	55.8	53.8	Below / No	2.4	0.4	---
	MBS-3	Single Family Residence	1		57.2	59.5	56.6	Below / No	2.3	-0.6	---
	MBS-4	Single Family Residence	1		59.2	61.4	57.8	Below / No	2.2	-1.4	---
	MBS-5	Single Family Residence	1		60.6	62.7	59.0	Below / No	2.1	-1.6	---
	MBS-6	Single Family Residence	1		61.0	63.1	59.5	Below / No	2.1	-1.5	---
	MBS-7	Single Family Residence	1		60.9	63.0	59.4	Below / No	2.1	-1.5	---
	MBS-8	Single Family Residence	1		61.1	63.2	59.8	Below / No	2.1	-1.3	---
	MSB-9	Single Family Residence	1		60.9	63.0	59.5	Below / No	2.1	-1.4	---
	MSB-10	Single Family Residence	1		61.0	63.1	59.7	Below / No	2.1	-1.3	---
	MSB-11	Single Family Residence	1		60.8	62.9	59.5	Below / No	2.1	-1.3	---
	MSB-12	Single Family Residence	1		59.1	61.2	57.8	Below / No	2.1	-1.3	---
	MBS-13	Single Family Residence	1		44.7	47.2	46.2	Below / No	2.5	1.5	---
	MBS-14	Single Family Residence	1		47.6	49.9	48.4	Below / No	2.3	0.8	---
	MBS-15	Single Family Residence	1		46.4	48.8	47.1	Below / No	2.4	0.7	---
	MBS-16	Single Family Residence	1		45.7	48.2	46.7	Below / No	2.5	1.0	---
	MBS-17	Single Family Residence	1		46.2	48.8	47.3	Below / No	2.6	1.1	---
	MBS-18	Single Family Residence	1		47.1	49.5	48.2	Below / No	2.4	1.1	---
	MBS-19	Single Family Residence	1		44.3	46.7	45.4	Below / No	2.4	1.1	---
	MBS-20	Single Family Residence	1		53.3	55.4	53.2	Below / No	2.1	-0.1	---
	MBS-21	Single Family Residence	1		61.2	63.2	60.8	Below / No	2.0	-0.4	---
	MBS-22	Single Family Residence	1		62.7	65.0	63.1	Below / No	2.3	0.4	---
	MBS-23	Single Family Residence	1		61.0	63.6	61.4	Below / No	2.6	0.4	---
	MBS-24	Single Family Residence	1		57.6	59.7	56.2	Below / No	2.1	-1.4	---
	MBS-25	Single Family Residence	1		55.8	58.9	56.5	Below / No	3.1	0.7	---
	MBS-26	Single Family Residence	1		45.8	48.6	47.0	Below / No	2.8	1.2	---
	MBS-27	Single Family Residence	1		45.6	49.6	48.1	Below / No	4.0	2.5	---
	MBS-28	Single Family Residence	1		48.5	50.7	49.2	Below / No	2.2	0.7	---
	MBS-29	Single Family Residence	1		46.9	51.1	49.4	Below / No	4.2	2.5	---
	MBS-30	Single Family Residence	1		61.6	65.7	62.1	Below / No	4.1	0.5	---
	MBS-31	Single Family Residence	1		61.3	65.5	62.1	Below / No	4.2	0.8	---
	MBS-32	Single Family Residence	1		55.8	59.4	56.5	Below / No	3.6	0.7	---
	MBS-33	Single Family Residence	1		58.2	62.6	60.1	Below / No	4.4	1.9	---
	MBS-34	Single Family Residence	1		50.4	53.1	51.7	Below / No	2.7	1.3	---
	MBS-35	Single Family Residence	1		48.3	52.8	53.0	Below / No	4.5	4.7	---
	MSB-36	Single Family Residence	1		43.4	46.4	45.6	Below / No	3.0	2.2	---
	MSB-37	Single Family Residence	1		50.7	55.2	55.4	Below / No	4.5	4.7	---
	MSB-38	Single Family Residence	1		48.6	53.0	54.3	Below / No	4.4	5.7	---
	MBT-1	Single Family Residence	1		58.9	61.3	58.1	Below / No	2.4	-0.8	---
	MBT-2	Single Family Residence	1		61.8	64.1	60.4	Below / No	2.3	-1.4	---
	MBT-3	Single Family Residence	1		58.7	60.9	57.8	Below / No	2.2	-0.9	---
	MBT-4	Single Family Residence	1		63.6	65.8	61.8	Below / No	2.2	-1.8	---
	MBT-5	Single Family Residence	1		65.1	**67.1**	63.1	Below / No	2.0	-2.0	---
	MBT-6	Single Family Residence	1		63.4	65.5	62.4	Below / No	2.1	-1.0	---
	MBT-7	Single Family Residence	1		63.2	65.3	62.6	Below / No	2.1	-0.6	---
	MBT-8	Single Family Residence	1		63.0	65.2	62.7	Below / No	2.2	-0.3	---
	MBT-9	Single Family Residence	1		59.5	61.6	58.2	Below / No	2.1	-1.3	---
	MBT-10	Single Family Residence	1		54.5	56.6	54.4	Below / No	2.1	-0.1	---
	MBT-11	Single Family Residence	1		51.2	53.4	51.9	Below / No	2.2	0.7	---
				Minimum	29.2	29.6	30.8	---	-3.2	-2.0	---
				Maximum	65.1	67.1	64.8	---	4.5	5.7	---
				Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)	0	2	0	---	---	---	---

Note: A bold value in the table indicates an impact, as does a status that shows that the Noise Abatement Criteria (NAC) has been met or exceeded.

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 2 of 5)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)			Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	Common Noise Environment (CNE) Identification Number (Comments)
					Existing Conditions	Design Year (2050)					
						No-Build Alternative	Build Alternative				
NSA 2 - See Figure 3.2 Sheets 3, 4, and 5											
SR 16 from Winner Way to East of Turnbull Drive	MCP-1	Park	1	Other Sensitive Land Use NAC C - 66 dB(A)	53.7	58.1	59.8	Below / No	4.4	6.1	---
	MCP-2	Park	1		51.6	56.1	58.1	Below / No	4.5	6.5	---
	SC-1	Single Family Residence	1	Residential NAC B - 66 dB(A)	49.8	54.3	57.3	Below / No	4.5	7.5	CNE S2.1
	SC-2	Single Family Residence	1		54.4	58.9	62.2	Below / No	4.5	7.8	
	SC-3	Single Family Residence	1		54.6	59.0	62.4	Below / No	4.4	7.8	
	SC-4	Single Family Residence	1		56.6	61.0	64.3	Below / No	4.4	7.7	
	SC-5	Single Family Residence	1		57.2	61.6	64.9	Below / No	4.4	7.7	
	SC-6	Single Family Residence	1		56.4	60.8	64.2	Below / No	4.4	7.8	
	SC-7	Single Family Residence	1		57.3	61.7	65.1	Below / No	4.4	7.8	
	SC-8	Single Family Residence	1		58.3	62.7	**66.0**	**Approaches / Yes**	4.4	7.7	
	SC-9	Single Family Residence	1		57.4	61.8	64.7	Below / No	4.4	7.3	
	SC-10	Single Family Residence	1		58.7	63.1	**66.0**	**Approaches / Yes**	4.4	7.3	
	SC-11	Single Family Residence	1		59.0	63.4	**66.1**	**Approaches / Yes**	4.4	7.1	
	SC-12	Single Family Residence	1		58.7	63.1	65.6	Below / No	4.4	6.9	
	SC-13	Single Family Residence	1		59.5	63.8	**66.1**	**Approaches / Yes**	4.3	6.6	
	SC-14	Single Family Residence	1		60.1	64.4	**66.6**	**Approaches / Yes**	4.3	6.5	
	SC-15	Single Family Residence	1		59.8	64.2	**66.0**	**Approaches / Yes**	4.4	6.2	
	SC-16	Single Family Residence	1		54.4	58.8	60.8	Below / No	4.4	6.4	
	SC-17	Single Family Residence	1		44.5	49.0	52.2	Below / No	4.5	7.7	
	SC-18	Single Family Residence	1		41.8	46.0	47.6	Below / No	4.2	5.8	
	SC-19	Single Family Residence	1		40.8	44.9	46.3	Below / No	4.1	5.5	
	SC-20	Single Family Residence	1		41.8	46.1	48.2	Below / No	4.3	6.4	
	SC-21	Single Family Residence	1		40.8	45.1	46.8	Below / No	4.3	6.0	
	SC-22	Single Family Residence	1		40.6	44.9	46.9	Below / No	4.3	6.3	
	SC-23	Single Family Residence	1		39.4	43.6	45.3	Below / No	4.2	5.9	
	SC-24	Single Family Residence	1		41.0	45.3	47.2	Below / No	4.3	6.2	
	SC-25	Single Family Residence	1		41.4	45.9	48.0	Below / No	4.5	6.6	
	SC-26	Single Family Residence	1		43.0	47.5	49.8	Below / No	4.5	6.8	
	SC-27	Single Family Residence	1		45.1	49.5	51.5	Below / No	4.4	6.4	
	SC-28	Single Family Residence	1		39.8	44.5	46.1	Below / No	4.7	6.3	
	SC-29	Single Family Residence	1		43.1	47.4	49.8	Below / No	4.3	6.7	
	SSC-1	Single Family Residence	1		55.5	59.9	62.3	Below / No	4.4	6.8	---
	SSC-2	Single Family Residence	1		51.4	55.8	58.1	Below / No	4.4	6.7	---
	CNH-1	Chruch	1	Institutional Interior NAC D - 51 dB(A)	33.9	38.2	40.6	Below / No	4.3	6.7	---
	SFN-1	Single Family Residence	1	Residential NAC B - 66 dB(A)	58.4	62.8	65.1	Below / No	4.4	6.7	---
	SFN-2	Single Family Residence	1		59.5	63.8	65.6	Below / No	4.3	6.1	---
	SFN-3	Single Family Residence	1		58.3	62.5	64.4	Below / No	4.2	6.1	---
	SFN-4	Single Family Residence	1		58.9	63.1	64.8	Below / No	4.2	5.9	---
	SFN-5	Single Family Residence	1		53.0	57.1	59.6	Below / No	4.1	6.6	---
	SFN-6	Single Family Residence	1		60.5	64.1	**66.7**	**Approaches / Yes**	3.6	6.2	Isloated Residence
	SFN-7	Single Family Residence	1		53.5	56.9	59.5	Below / No	3.4	6.0	---
	SFN-8	Single Family Residence	1		51.5	54.2	56.9	Below / No	2.7	5.4	---
	SFN-9	Single Family Residence	1		58.5	60.3	64.7	Below / No	1.8	6.2	---
	SFN-10	Single Family Residence	1		54.3	56.0	58.8	Below / No	1.7	4.5	---
	SFS-1	Single Family Residence	1		64.9	**69.3**	**69.4**	**Exceeds / Yes**	4.4	4.5	Isloated Residence
	SFS-2	Single Family Residence	1		63.7	**68.1**	**67.4**	**Exceeds / Yes**	4.4	3.7	Isloated Residence
	SFS-3	Single Family Residence	1		60.0	64.4	62.9	Below / No	4.4	2.9	---
	SFS-4	Single Family Residence	1		60.7	65.0	63.5	Below / No	4.3	2.8	---
	SFS-5	Single Family Residence	1		62.9	**67.2**	**66.8**	**Approaches / Yes**	4.3	3.9	Isloated Residence
	SFS-6	Single Family Residence	1		61.6	65.9	65.4	Below / No	4.3	3.8	---
	SFS-7	Single Family Residence	1		56.9	60.1	60.5	Below / No	3.2	3.6	---
	SFS-8	Single Family Residence	1		60.6	63.2	64.2	Below / No	2.6	3.6	---
	SFS-9	Single Family Residence	1		62.5	64.0	**66.0**	**Approaches / Yes**	1.5	3.5	Isloated Residence
	SFS-10	Single Family Residence	1		53.1	54.9	57.5	Below / No	1.8	4.4	---
	SFS-11	Single Family Residence	1		61.9	63.5	65.6	Below / No	1.6	3.7	---
	SFS-12	Single Family Residence	1		53.2	54.8	57.7	Below / No	1.6	4.5	
	SFS-13	Single Family Residence	1		50.6	52.3	55.7	Below / No	1.7	5.1	---
				Minimum	33.9	38.2	40.6	---	1.5	2.8	---
				Maximum	64.9	69.3	69.4	---	4.7	7.8	---
				Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)	0	3	11	---	---	---	---
NSA 3 - See Figure 3.1 Sheets 5, 6, and 7											
SR 16 from East of Turnbull Drive to East of Turnbull Creek Road	SFN-11	Single Family Residence	1	Residential NAC B - 66 dB(A)	58.8	60.3	**67.5**	**Exceeds / Yes**	1.5	8.7	Isloated Residence
	KRN-2	Single Family Residence	1		57.8	59.3	**66.4**	**Approaches / Yes**	1.5	8.6	Isloated Residence
	KRN-2	Single Family Residence	1		58.0	59.5	**66.4**	**Approaches / Yes**	1.5	8.4	Isloated Residence
	KRN-3	Single Family Residence	1		59.7	61.2	**68.3**	**Exceeds / Yes**	1.5	8.6	Isloated Residence
	KRN-4	Single Family Residence	1		51.1	52.6	58.5	Below / No	1.5	7.4	---
	KRN-5	Single Family Residence	1		54.2	55.7	62.6	Below / No	1.5	8.4	---
	KRN-6	Single Family Residence	1		53.7	55.1	57.4	Below / No	1.4	3.7	---
	KRS-1	Single Family Residence	1		57.5	58.9	63.5	Below / No	1.4	6.0	---
	KRS-1.2	Single Family Residence	1		51.8	53.3	57.7	Below / No	1.5	5.9	---
	KRS-2.1	Single Family Residence	1		64.3	65.8	**68.3**	**Exceeds / Yes**	1.5	4.0	Isloated Residence
	KRS-2.2	Single Family Residence	1		56.9	58.4	62.4	Below / No	1.5	5.5	---
	KRS-3.1	Single Family Residence	1		56.0	57.5	61.7	Below / No	1.5	5.7	---
	KRS-3.2	Single Family Residence	1		57.8	59.2	63.5	Below / No	1.4	5.7	---
	KRS-4	Single Family Residence	1		62.8	64.3	**68.3**	**Exceeds / Yes**	1.5	5.5	Isloated Residence
	KRS-5	Single Family Residence	1		52.3	53.7	58.7	Below / No	1.4	6.4	---
	KRS-6	Single Family Residence	1		49.7	51.1	56.2	Below / No	1.4	6.5	---
	KRS-7	Single Family Residence	1		51.6	53.1	57.4	Below / No	1.5	5.8	---
	KRS-8	Single Family Residence	1		56.4	57.9	61.5	Below / No	1.5	5.1	---
	KRS-9	Single Family Residence	1		54.4	55.9	59.5	Below / No	1.5	5.1	---
	TPS-C.1	Single Family Residence	1		58.4	60.0	64.6	Below / No	1.6	6.2	CNE 3.1
	TPS-C.2	Single Family Residence	1		56.9	58.4	62.2	Below / No	1.5	5.3	
	TPS-1	Single Family Residence	1		59.5	61.0	65.8	Below / No	1.5	6.3	
	TPS-2	Single Family Residence	1		59.4	60.9	65.7	Below / No	1.5	6.3	
	TPS-3	Single Family Residence	1		59.3	60.8	65.5	Below / No	1.5	6.2	
	TPS-4	Single Family Residence	1		59.8	61.4	**66.2**	**Approaches / Yes**	1.6	6.4	
	TPS-5	Single Family Residence	1		60.1	61.7	**66.5**	**Approaches / Yes**	1.6	6.4	
	TPS-6	Single Family Residence	1		60.7	62.4	**66.8**	**Approaches / Yes**	1.7	6.1	
	TPS-7	Single Family Residence	1		60.5	62.3	**67.0**	**Meets / Yes**	1.8	6.5	
	TPS-8	Single Family Residence	1		60.9	62.8	**67.0**	**Meets / Yes**	1.9	6.1	
	TPS-9	Single Family Residence	1		60.3	62.3	**66.6**	**Approaches / Yes**	2.0	6.3	
	TPS-10	Single Family Residence	1		60.7	62.8	**67.0**	**Meets / Yes**	2.1	6.3	

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 3 of 5)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)			Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	Common Noise Environment (CNE) Identification Number (Comments)
					Existing Conditions	Design Year (2050)					
						No-Build Alternative	Build Alternative				
SR 16 from East of Turnbull Drive to East of Turnbull Creek Road	TPS-11	Single Family Residence	1	Residential NAC B - 66 dB(A)	61.7	64.1	**67.7**	**Exceeds / Yes**	2.4	6.0	CNE 3.1
	TPS-12	Single Family Residence	1		54.6	56.1	59.8	Below / No	1.5	5.2	
	TPS-13	Single Family Residence	1		44.9	46.6	50.1	Below / No	1.7	5.2	
	TPS-14	Single Family Residence	1		48.0	49.6	54.6	Below / No	1.6	6.6	
	TPS-15	Single Family Residence	1		46.1	47.7	53.1	Below / No	1.6	7.0	
	TPS-16	Single Family Residence	1		49.4	51.0	56.0	Below / No	1.6	6.6	
	TPS-17	Single Family Residence	1		47.2	48.7	53.9	Below / No	1.5	6.7	
	TPS-18	Single Family Residence	1		47.2	48.9	53.4	Below / No	1.7	6.2	
	TPS-19	Single Family Residence	1		46.2	48.1	52.7	Below / No	1.9	6.5	
	TPS-20	Single Family Residence	1		46.4	48.3	52.7	Below / No	1.9	6.3	
	TPS-21	Single Family Residence	1		49.5	51.9	55.4	Below / No	2.4	5.9	
	TPS-22	Single Family Residence	1		51.2	53.5	57.3	Below / No	2.3	6.1	
	TSC-1	Park	1	Other Sensitive Land Use NAC C - 66 dB(A)	65.1	**66.9**	**67.6**	**Exceeds / Yes**	1.8	2.5	Isloated Receptors
	TSC-2	Park	1		64.8	**67.1**	**67.4**	**Exceeds / Yes**	2.3	2.6	Isloated Receptors
				Minimum	44.9	46.6	50.1	---	1.4	2.5	---
				Maximum	65.1	**67.1**	**68.3**	---	2.4	8.6	---
			Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)		0	2	15	---	---	---	---
NSA 4 - See Figure 3.1 Sheets 7, 8, and 9											
SR 16 from East of Turnbull Creek Road West of Elevation Parkway	TPC-1	School	1	Institutional Interior NAC D - 51 dB(A)	26.8	29.0	33.1	Below / No	2.2	6.3	---
	WRN-1	Single Family Residence	1	Residential NAC B - 66 dB(A)	58.4	58.9	62.9	Below / No	0.5	4.5	---
	PP-1	Single Family Residence	1		57.0	56.4	60.1	Below / No	-0.6	3.1	---
	PP-2	Single Family Residence	1		56.8	56.1	59.9	Below / No	-0.7	3.1	---
	PP-3	Single Family Residence	1		56.6	55.9	59.7	Below / No	-0.7	3.1	---
	PP-4	Single Family Residence	1		53.7	52.9	56.7	Below / No	-0.8	3.0	---
	PP-5	Single Family Residence	1		53.3	52.5	56.4	Below / No	-0.8	3.1	---
	WR-1	Single Family Residence	1		51.7	51.9	54.2	Below / No	0.2	2.5	---
	WR-2	Single Family Residence	1		50.9	51.2	53.1	Below / No	0.3	2.2	---
	WR-3	Single Family Residence	1		53.0	53.0	55.4	Below / No	0.0	2.4	---
	WR-4	Single Family Residence	1		54.9	54.6	57.2	Below / No	-0.3	2.3	---
	WR-5	Single Family Residence	1		56.2	55.8	58.3	Below / No	-0.4	2.1	---
	WR-6	Single Family Residence	1		56.8	56.4	58.9	Below / No	-0.4	2.1	---
	WR-7	Single Family Residence	1		58.1	57.6	60.1	Below / No	-0.5	2.0	---
	WR-8	Single Family Residence	1		58.3	57.8	60.2	Below / No	-0.5	1.9	---
	WR-9	Single Family Residence	1		62.1	61.4	62.5	Below / No	-0.7	0.4	---
	WR-10	Single Family Residence	1		62.5	61.8	62.8	Below / No	-0.7	0.3	---
	WR-11	Single Family Residence	1		63.0	62.3	64.0	Below / No	-0.7	1.0	---
	WR-12	Single Family Residence	1		63.3	62.5	64.4	Below / No	-0.8	1.1	---
	WR-13	Single Family Residence	1		64.5	63.8	**66.8**	**Approaches / Yes**	-0.7	2.3	CNE S4.2
	WR-14	Single Family Residence	1		64.2	63.5	**66.8**	**Approaches / Yes**	-0.7	2.6	
	WR-15	Single Family Residence	1		64.3	63.5	**66.8**	**Approaches / Yes**	-0.8	2.5	
	WR-16	Single Family Residence	1		63.9	63.1	**66.0**	**Approaches / Yes**	-0.8	2.1	
	WR-17	Single Family Residence	1		63.0	62.2	64.6	Below / No	-0.8	1.6	
	WR-18	Single Family Residence	1		62.1	61.3	63.7	Below / No	-0.8	1.6	---
	WR-19	Single Family Residence	1		59.4	58.7	61.8	Below / No	-0.7	2.4	---
	WR-20	Single Family Residence	1		55.9	55.1	58.8	Below / No	-0.8	2.9	---
	WR-21	Single Family Residence	1		45.4	44.9	48.1	Below / No	-0.5	2.7	---
	WR-22	Single Family Residence	1		45.7	45.2	48.6	Below / No	-0.5	2.9	---
	WR-23	Single Family Residence	1		45.5	45.0	48.7	Below / No	-0.5	3.2	---
	WR-24	Single Family Residence	1		46.4	45.8	49.5	Below / No	-0.6	3.1	---
	WR-25	Single Family Residence	1		46.4	45.8	49.5	Below / No	-0.6	3.1	---
	WR-26	Single Family Residence	1		47.7	47.1	50.3	Below / No	-0.6	2.6	---
	WR-27	Single Family Residence	1		47.7	47.1	50.4	Below / No	-0.6	2.7	---
	WR-28	Single Family Residence	1		47.3	46.7	50.2	Below / No	-0.6	2.9	---
	WR-29	Single Family Residence	1		47.0	46.4	50.0	Below / No	-0.6	3.0	---
	WR-30	Single Family Residence	1		47.5	46.9	50.1	Below / No	-0.6	2.6	---
	WR-31	Single Family Residence	1		47.1	46.5	50.6	Below / No	-0.6	3.5	---
	WR-32	Single Family Residence	1		44.3	43.8	47.7	Below / No	-0.5	3.4	---
	WR-33	Single Family Residence	1		53.5	52.7	56.5	Below / No	-0.8	3.0	---
	WR-34	Single Family Residence	1		49.3	48.5	53.2	Below / No	-0.8	3.9	---
	DCN-1	Single Family Residence	1		59.4	58.5	64.8	Below / No	-0.9	5.4	---
	TP-1	School	1	Institutional Interior NAC D - 51 dB(A)	33.2	32.4	39.4	Below / No	-0.8	6.2	---
	TP-2	School	1		31.2	30.3	37.3	Below / No	-0.9	6.1	---
	TP-3	School	1		24.0	23.5	27.8	Below / No	-0.5	3.8	---
	KJW-1	Church	1		32.2	31.5	37.2	Below / No	-0.7	5.0	---
	SA-1.1	Multi-Family Residence	1	Residential NAC B - 66 dB(A)	54.9	54.0	57.9	Below / No	-0.9	3.0	---
	SA-1.2	Multi-Family Residence	1		58.5	57.6	61.4	Below / No	-0.9	2.9	---
	SA-1.3	Multi-Family Residence	1		60.2	59.3	62.8	Below / No	-0.9	2.6	---
	SA-1.4	Multi-Family Residence	1		61.0	60.1	63.6	Below / No	-0.9	2.6	---
	SA-2.1	Multi-Family Residence	1		53.4	52.5	56.6	Below / No	-0.9	3.2	---
	SA-2.2	Multi-Family Residence	1		57.4	56.5	60.3	Below / No	-0.9	2.9	---
	SA-2.3	Multi-Family Residence	1		58.8	57.9	61.5	Below / No	-0.9	2.7	---
	SA-2.4	Multi-Family Residence	1		60.0	59.1	62.5	Below / No	-0.9	2.5	---
	SA-3.1	Multi-Family Residence	1		52.5	51.7	55.9	Below / No	-0.8	3.4	---
	SA-3.2	Multi-Family Residence	1		56.8	55.9	59.6	Below / No	-0.9	2.8	---
	SA-3.3	Multi-Family Residence	1		58.1	57.2	60.9	Below / No	-0.9	2.8	---
	SA-3.4	Multi-Family Residence	1		59.3	58.4	61.8	Below / No	-0.9	2.5	---
	SA-4.1	Multi-Family Residence	1		51.9	51.1	55.5	Below / No	-0.8	3.6	---
	SA-4.2	Multi-Family Residence	1		56.4	55.5	59.2	Below / No	-0.9	2.8	---
	SA-4.3	Multi-Family Residence	1		57.6	56.8	60.5	Below / No	-0.8	2.9	---
	SA-4.4	Multi-Family Residence	1		58.8	57.9	61.4	Below / No	-0.9	2.6	---
	SA-5.1	Multi-Family Residence	1		51.1	50.3	55.0	Below / No	-0.8	3.9	---
	SA-5.2	Multi-Family Residence	1		55.7	54.8	58.6	Below / No	-0.9	2.9	---
	SA-5.3	Multi-Family Residence	1		57.0	56.1	59.8	Below / No	-0.9	2.8	---
	SA-5.4	Multi-Family Residence	1		58.0	57.2	60.7	Below / No	-0.8	2.7	---
	SA-6.1	Multi-Family Residence	1		49.7	48.8	53.9	Below / No	-0.9	4.2	---
	SA-6.2	Multi-Family Residence	1		53.9	53.0	57.0	Below / No	-0.9	3.1	---
	SA-6.3	Multi-Family Residence	1		55.3	54.4	58.1	Below / No	-0.9	2.8	---
	SA-6.4	Multi-Family Residence	1		56.7	55.7	59.2	Below / No	-1.0	2.5	---
	SA-7.1	Multi-Family Residence	1		41.8	41.3	45.7	Below / No	-0.5	3.9	---
	SA-7.2	Multi-Family Residence	1		46.3	45.5	49.0	Below / No	-0.8	2.7	---
	SA-7.3	Multi-Family Residence	1		47.8	47.0	50.5	Below / No	-0.8	2.7	---
	SA-7.4	Multi-Family Residence	1		49.3	48.5	51.9	Below / No	-0.8	2.6	---
	SA-8.1	Multi-Family Residence	1		40.5	40.3	44.4	Below / No	-0.2	3.9	---
	SA-8.2	Multi-Family Residence	1		44.7	44.1	47.4	Below / No	-0.6	2.7	---

Note: A bold value in the table indicates an impact, as does a status that shows that the Noise Abatement Criteria (NAC) has been met or exceeded.

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 4 of 5)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)			Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	Common Noise Environment (CNE) Identification Number (Comments)
					Existing Conditions	Design Year (2050)					
						No-Build Alternative	Build Alternative				
SR 16 from East of Turnbull Creek Road West of Elevation Parkway	SA-8.3	Multi-Family Residence	1	Residential NAC B - 66 dB(A)	46.3	45.6	49.0	Below / No	-0.7	2.7	---
	SA-8.4	Multi-Family Residence	1		47.8	47.1	50.5	Below / No	-0.7	2.7	---
	SA-9.1	Multi-Family Residence	1		39.9	39.8	43.8	Below / No	-0.1	3.9	---
	SA-9.2	Multi-Family Residence	1		44.2	43.6	46.5	Below / No	-0.6	2.3	---
	SA-9.3	Multi-Family Residence	1		45.6	45.0	48.2	Below / No	-0.6	2.6	---
	SA-9.4	Multi-Family Residence	1		46.9	46.3	49.7	Below / No	-0.6	2.8	---
	SA-10.1	Multi-Family Residence	1		38.2	38.0	43.0	Below / No	-0.2	4.8	---
	SA-10.2	Multi-Family Residence	1		42.6	41.9	45.4	Below / No	-0.7	2.8	---
	SA-10.3	Multi-Family Residence	1		44.3	43.6	47.2	Below / No	-0.7	2.9	---
	SA-10.4	Multi-Family Residence	1		45.5	44.8	48.6	Below / No	-0.7	3.1	---
	SA-11.1	Multi-Family Residence	1		60.1	59.1	62.7	Below / No	-1.0	2.6	
	SA-11.2	Multi-Family Residence	1		62.8	61.9	64.9	Below / No	-0.9	2.1	
	SA-11.3	Multi-Family Residence	1		63.6	62.7	**66.1**	**Approaches / Yes**	-0.9	2.5	
	SA-11.4	Multi-Family Residence	1		63.7	62.8	**66.2**	**Approaches / Yes**	-0.9	2.5	
	SA-12.1	Multi-Family Residence	1		53.7	52.8	56.8	Below / No	-0.9	3.1	
	SA-12.2	Multi-Family Residence	1		56.7	55.8	59.1	Below / No	-0.9	2.4	
	SA-12.3	Multi-Family Residence	1		59.5	58.5	61.7	Below / No	-1.0	2.2	
	SA-12.4	Multi-Family Residence	1		59.6	58.7	62.2	Below / No	-0.9	2.6	
	SA-13.1	Multi-Family Residence	1		51.0	50.1	54.0	Below / No	-0.9	3.0	
	SA-13.2	Multi-Family Residence	1		54.6	53.7	57.0	Below / No	-0.9	2.4	
	SA-13.3	Multi-Family Residence	1		57.8	56.9	60.3	Below / No	-0.9	2.5	
	SA-13.4	Multi-Family Residence	1		58.6	57.7	61.2	Below / No	-0.9	2.6	
	SA-14.1	Multi-Family Residence	1		48.7	47.9	51.7	Below / No	-0.8	3.0	
	SA-14.2	Multi-Family Residence	1		53.1	52.2	55.6	Below / No	-0.9	2.5	
	SA-14.3	Multi-Family Residence	1		55.9	55.0	58.7	Below / No	-0.9	2.8	
	SA-14.4	Multi-Family Residence	1		57.7	56.8	60.2	Below / No	-0.9	2.5	
	SA-15.1	Multi-Family Residence	1		47.7	46.9	50.9	Below / No	-0.8	3.2	
	SA-15.2	Multi-Family Residence	1		52.2	51.3	54.8	Below / No	-0.9	2.6	
	SA-15.3	Multi-Family Residence	1		54.1	53.2	56.9	Below / No	-0.9	2.8	
	SA-15.4	Multi-Family Residence	1		56.3	55.4	58.9	Below / No	-0.9	2.6	
	SA-16.1	Multi-Family Residence	1		59.8	58.9	62.3	Below / No	-0.9	2.5	
	SA-16.2	Multi-Family Residence	1		62.7	61.8	64.9	Below / No	-0.9	2.2	
	SA-16.3	Multi-Family Residence	1		63.5	62.7	**66.0**	**Approaches / Yes**	-0.8	2.5	
	SA-16.4	Multi-Family Residence	1		63.6	62.7	**66.2**	**Approaches / Yes**	-0.9	2.6	
	SA-17.1	Multi-Family Residence	1		53.4	52.6	56.6	Below / No	-0.8	3.2	
	SA-17.2	Multi-Family Residence	1		57.2	56.3	59.9	Below / No	-0.9	2.7	
	SA-17.3	Multi-Family Residence	1		59.1	58.2	61.4	Below / No	-0.9	2.3	
	SA-17.4	Multi-Family Residence	1		59.4	58.5	62.0	Below / No	-0.9	2.6	
	SA-18.1	Multi-Family Residence	1		52.1	51.3	55.2	Below / No	-0.8	3.1	
	SA-18.2	Multi-Family Residence	1		55.8	55.0	58.7	Below / No	-0.8	2.9	
	SA-18.3	Multi-Family Residence	1		57.6	56.8	60.1	Below / No	-0.8	2.5	
	SA-18.4	Multi-Family Residence	1		58.4	57.6	61.0	Below / No	-0.8	2.6	
	SA-19.1	Multi-Family Residence	1		50.6	49.9	54.0	Below / No	-0.7	3.4	CNE S4.1
	SA-19.2	Multi-Family Residence	1		54.5	53.7	57.5	Below / No	-0.8	3.0	
	SA-19.3	Multi-Family Residence	1		56.2	55.4	58.9	Below / No	-0.8	2.7	
	SA-19.4	Multi-Family Residence	1		57.4	56.6	59.9	Below / No	-0.8	2.5	
	SA-20.1	Multi-Family Residence	1		49.1	48.5	53.0	Below / No	-0.6	3.9	
	SA-20.2	Multi-Family Residence	1		53.1	52.3	56.3	Below / No	-0.8	3.2	
	SA-20.3	Multi-Family Residence	1		54.7	54.0	57.7	Below / No	-0.7	3.0	
	SA-20.4	Multi-Family Residence	1		56.0	55.3	58.7	Below / No	-0.7	2.7	
	SA-21.1	Multi-Family Residence	1		59.6	58.7	62.3	Below / No	-0.9	2.7	
	SA-21.2	Multi-Family Residence	1		62.7	61.8	64.9	Below / No	-0.9	2.2	
	SA-21.3	Multi-Family Residence	1		63.6	62.7	**66.1**	**Approaches / Yes**	-0.9	2.5	
	SA-21.4	Multi-Family Residence	1		63.7	62.8	**66.2**	**Approaches / Yes**	-0.9	2.5	
	SA-22.1	Multi-Family Residence	1		59.5	58.6	62.3	Below / No	-0.9	2.8	
	SA-22.2	Multi-Family Residence	1		62.9	62.0	65.1	Below / No	-0.9	2.2	
	SA-22.3	Multi-Family Residence	1		63.7	62.8	**66.2**	**Approaches / Yes**	-0.9	2.5	
	SA-22.4	Multi-Family Residence	1		63.8	62.9	**66.3**	**Approaches / Yes**	-0.9	2.5	
	SA-23.1	Multi-Family Residence	1		59.3	58.5	62.3	Below / No	-0.8	3.0	
	SA-23.2	Multi-Family Residence	1		62.9	62.0	65.1	Below / No	-0.9	2.2	
	SA-23.3	Multi-Family Residence	1		63.7	62.8	**66.2**	**Approaches / Yes**	-0.9	2.5	
	SA-23.4	Multi-Family Residence	1		63.8	62.9	**66.3**	**Approaches / Yes**	-0.9	2.5	
	SA-24.1	Multi-Family Residence	1		59.4	58.6	62.3	Below / No	-0.8	2.9	
	SA-24.2	Multi-Family Residence	1		63.0	62.1	65.2	Below / No	-0.9	2.2	
	SA-24.3	Multi-Family Residence	1		63.8	62.9	**66.3**	**Approaches / Yes**	-0.9	2.5	
	SA-24.4	Multi-Family Residence	1		63.8	63.0	**66.4**	**Approaches / Yes**	-0.8	2.6	
	SA-25.1	Multi-Family Residence	1		59.3	58.5	62.2	Below / No	-0.8	2.9	
	SA-25.2	Multi-Family Residence	1		62.9	62.0	65.2	Below / No	-0.9	2.3	
	SA-25.3	Multi-Family Residence	1		63.8	62.9	**66.3**	**Approaches / Yes**	-0.9	2.5	
	SA-25.4	Multi-Family Residence	1		63.8	63.0	**66.4**	**Approaches / Yes**	-0.8	2.6	
	SA-26.1	Multi-Family Residence	1		59.4	58.5	62.3	Below / No	-0.9	2.9	
	SA-26.2	Multi-Family Residence	1		63.0	62.1	65.3	Below / No	-0.9	2.3	
	SA-26.3	Multi-Family Residence	1		63.8	63.0	**66.4**	**Approaches / Yes**	-0.8	2.6	
	SA-26.4	Multi-Family Residence	1		63.9	63.1	**66.5**	**Approaches / Yes**	-0.8	2.6	
				Minimum	24.0	23.5	27.8	---	-1.0	0.3	---
				Maximum	64.5	63.8	66.8	---	2.2	6.3	---
				Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)	0	0	20	---	---	---	---
NSA 5 - See Figure 3.1 Sheets 9 and 10											
SR 16 from East of Elevation Parkway to Interstate 95	AL-1	Adventure Landings (Recreational Area)	1	Other Sensitive Land Use NAC C - 66 dB(A)	63.7	65.4	**66.1**	**Approaches / Yes**	1.7	2.4	---
	AL-2		1		63.3	65.0	**66.0**	**Approaches / Yes**	1.7	2.7	---
	AL-3		1		63.3	65.0	**66.0**	**Approaches / Yes**	1.7	2.7	---
	AL-4		1		63.2	64.9	65.9	Below / No	1.7	2.7	---
	AL-5		1		63.0	64.7	65.8	Below / No	1.7	2.8	---
	AL-6		1		62.6	64.3	65.8	Below / No	1.7	3.2	---
	AL-7		1		62.6	64.2	65.8	Below / No	1.6	3.2	---
	AL-8		1		62.6	64.3	65.6	Below / No	1.7	3.0	---
	AL-9		1		63.2	64.9	65.6	Below / No	1.7	2.4	---
	AL-10		1		63.2	64.8	65.6	Below / No	1.6	2.4	---
	AL-11		1		61.3	63.0	64.3	Below / No	1.7	3.0	---
	AL-12		1		61.2	62.9	64.5	Below / No	1.7	3.3	---
	AL-13		1		60.9	62.6	64.3	Below / No	1.7	3.4	---
	AL-14		1		61.1	62.8	64.2	Below / No	1.7	3.1	---
	AL-15		1		60.9	62.6	64.2	Below / No	1.7	3.3	---
	AL-16		1		60.9	62.6	64.2	Below / No	1.7	3.3	---
	AL-17		1		60.9	62.6	64.3	Below / No	1.7	3.4	---
	AL-18		1		61.2	62.9	64.2	Below / No	1.7	3.0	---
	AL-19		1		61.5	63.2	64.3	Below / No	1.7	2.8	---

Note: A bold value in the table indicates an impact, as does a status that shows that the Noise Abatement Criteria (NAC) has been met or exceeded.

Table 3.2: Location and Description of Representative Noise Sensitive Receptor Sites and Noise Analysis Results (Sheet 5 of 5)

Name of Noise Sensitive Area/Site	Representative Noise Receptor Site Designation	Noise Sensitive Site Description	Number of Noise Sensitive Sites Represented	Noise Abatement Activity Category - Criteria	TNM Predicted Noise Levels (dBA)			Noise Abatement Criteria Status / Consideration of Noise Abatement Warranted? Yes or No	Difference Between Existing Conditions and No-Build Alternative	Difference Between Existing Conditions and Build Alternative	Common Noise Environment (CNE) Identification Number (Comments)
					Existing Conditions	Design Year (2050)					
						No-Build Alternative	Build Alternative				
SR 16 from East of Elevation Parkway to Interstate 95	AL-20	Adventure Landings (Recreational Area)	1	Other Sensitive Land Use NAC C - 66 dB(A)	61.0	62.7	64.3	Below / No	1.7	3.3	---
	AL-21		1		59.7	61.4	62.8	Below / No	1.7	3.1	---
	AL-22		1		59.6	61.3	62.8	Below / No	1.7	3.2	---
	AL-23		1		59.5	61.2	62.8	Below / No	1.7	3.3	---
	AL-24		1		59.5	61.2	62.7	Below / No	1.7	3.2	---
	AL-25		1		59.5	61.2	62.7	Below / No	1.7	3.2	---
	AL-26		1		59.5	61.2	62.7	Below / No	1.7	3.2	---
	AL-27		1		59.5	61.2	62.7	Below / No	1.7	3.2	---
	AL-28		1		59.5	61.2	62.7	Below / No	1.7	3.2	---
	AL-29		1		59.5	61.2	62.6	Below / No	1.7	3.1	---
	AL-30		1		59.5	61.2	62.6	Below / No	1.7	3.1	---
	DI-1	Hotel	1	Commerical NAC E - 71 dB(A)	48.3	49.8	48.8	Below / No	1.5	0.5	---
	SM-1	Hotel	1		52.2	53.7	54.2	Below / No	1.5	2.0	---
	SS-1	Hotel	1		46.7	48.1	48.1	Below / No	1.4	1.4	---
	HI-1	Hotel	1		47.2	48.5	49.2	Below / No	1.3	2.0	---
				Minimum	46.7	48.1	48.1	---	1.3	0.5	---
				Maximum	63.7	65.4	66.1	---	1.7	3.4	---
			Total Number of Residential Sites Equal to or Greater than the Noise Abatement Criteria (NAC) of 66 dB(A)		0	0	3	---	---	---	---

Note: A bold value in the table indicates an impact, as does a status that shows that the Noise Abatement Criteria (NAC) has been met or exceeded.

Appendix C

Noise Barrier Summary Tables 3.4 through 3.7

Table 3.4: Noise Barrier Analyses for Common Noise Environment CNE S2.1 (Sevilla Community)

General Location/Station Range	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Number of Impacted/ Benefited Receptor Sites	Number of Benefited Receptor Sites/ Not Impacted	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites dB(A)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost ($40 per square foot)	Average Cost/Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of $64,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Comments
South of SR 16 and East of Winners Way/ 158+00 - 168+00	SC-CD1	Ground Mounted	North of Sr 16 East of Winners Way to West of S Francis Road	14	1,000	158+00	168+00	6	6	7	13	7.3	8.5	$560,000	$43,077	NO	---
	SC-CD2	Ground Mounted	North of Sr 16 East of Winners Way to West of S Francis Road	16	1,000	158+00	168+00	6	6	7	13	8.0	9.5	$640,000	$49,231	YES	---
	SC-CD3	Ground Mounted	North of Sr 16 East of Winners Way to West of S Francis Road	18	1,000	158+00	168+00	6	6	7	13	8.5	10.4	$720,000	$55,385	YES	---
	SC-CD4	Ground Mounted	North of Sr 16 East of Winners Way to West of S Francis Road	20	1,000	158+00	168+00	6	6	8	14	8.7	11.1	$800,000	$57,143	YES	---
	SC-CD5	Ground Mounted	North of Sr 16 East of Winners Way to West of S Francis Road	22	1,000	158+00	168+00	6	6	8	14	9.0	11.7	$880,000	$62,857	YES	Conceptual Barrier Design PL-CD5 recommended for further consideration and public input.

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Represents the conceptual noise barrier design recommended for further consideration and public input in the Final Design phase.

Table 3.5: Noise Barrier Analyses for Common Noise Environment CNE S3.1 (Tomoka Pines Subdivision)

General Location/Station Range	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Number of Impacted/ Benefited Receptor Sites	Number of Benefited Receptor Sites/ Not Impacted	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites dB(A)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost ($40 per square foot)	Average Cost/Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of $64,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Comments
North of SR 16 and East and West of Tomoka Pines Subdivision/ 277+00 - 291+00	TPS-CD1	Ground Mounted	East of SR 16 West of Turnbull Creek Road to East of Turnbull Creek Road	22	500	277+00	282+00	6	8	1	9	6.4	7.3	$959,200	$106,578	NO	---
				22	370	283+60	287+30										
				22	220	287+80	291+00										
	TPS-CD2	Ground Mounted	East of SR 16 West of Turnbull Creek Road to East of Turnbull Creek Road	22	500	277+00	282+00	8	8	5	13	6.4	7.9	$959,200	$73,785	NO	---
				22	370	283+60	287+30										
				22	220	287+80	291+00										
	TPS-CD3	Ground Mounted	East of SR 16 West of Turnbull Creek Road to East of Turnbull Creek Road	22	500	277+00	282+00	8	8	5	13	6.8	8.3	$959,200	$73,785	NO	---
				22	370	283+60	287+30										
				22	220	287+80	291+00										
	TPS-CD4	Ground Mounted	East of SR 16 West of Turnbull Creek Road to East of Turnbull Creek Road	22	500	277+00	282+00	8	8	5	13	7.1	8.6	$959,200	$73,785	NO	---
				22	370	283+60	287+30										
				22	220	287+80	291+00										
	TPS-CD5	Ground Mounted	East of SR 16 West of Turnbull Creek Road to East of Turnbull Creek Road	22	500	277+00	282+00	8	8	7	15	7.0	8.9	$959,200	$63,947	YES	Conceptual Barrier Design TPS-CD5 recommended for further consideration and public input.
				22	370	283+60	287+30										
				22	220	287+80	291+00										

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Represents the conceptual noise barrier design recommended for further consideration and public input in the Final Design phase.

Table 3.6: Noise Barrier Analyses for Common Noise Environment CNE S4.1 (Windward Ranch)

General Location/Station Range)	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Number of Impacted/ Benefited Receptor Sites	Number of Benefited Receptor Sites/ Not Impacted	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites dB(A)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost ($40 per square foot)	Average Cost/Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of $64,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Comments
South of SR 16 and East of Windward Ranch Boluvard to West of Whisper Ridge Drive / 320+00 - 331+00	WR-CD1	Ground Mounted	West of SR 16 East of Windward Ranch Road to West of Whisper Ridge Drive	18	500	326+00	331+00	4	4	0	4	7.1	7.5	$360,000	$90,000	NO	---
	WR-CD2	Ground Mounted	West of SR 16 East of Windward Ranch Road to West of Whisper Ridge Drive	20	500	326+00	331+00	4	4	0	4	7.5	7.9	$400,000	$100,000	NO	---
	WR-CD3	Ground Mounted	West of SR 16 East of Windward Ranch Road to West of Whisper Ridge Drive	22	500	326+00	331+00	4	4	0	4	7.7	8.2	$440,000	$110,000	NO	---

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Represents the conceptual noise barrier design recommended for further consideration and public input in the Final Design phase.

Table 3.7: Noise Barrier Analyses for Common Noise Environment CNE S4.2 (Soluna Apartments)

General Location/Station Range	Conceptual Noise Barrier Design Number	Noise Barrier Type (Segment Name)	Noise Barrier Location	Height (feet)	Length (feet)	Begin Station Number	End Station Number	Number of Impacted Receptor Sites	Number of Impacted/ Benefited Receptor Sites	Number of Benefited Receptor Sites/ Not Impacted	Total Number of Benefited Receptor Sites	Average Noise Reduction for all Benefited Receptor Sites dB(A)	Maximum Noise Reduction for all Benefited Receptor Sites dB(A)	Cost ($40 per square foot)	Average Cost/Site Benefited	Does Optimal Barrier Design Meet FDOT's Reasonable Noise Abatement Criteria of $64,000 per Benefited Receptor Site and 7.0 dB(A) Noise Reduction Design Goal?	Comments
South of SR 16 and East of Amber Sun Way / 350+00 - 362+00	SA-CD1	Ground Mounted	West of SR 16 East of Soluna Apartments New Entrance	14	280	350+00	352+80	20	0	25	25	6.0	6.6	$582,400	$23,296	NO	---
				14	760	353+50	362+00										
	SA-CD2	Ground Mounted	West of SR 16 East of Soluna Apartments New Entrance	16	280	350+00	352+80	20	9	34	43	6.3	7.6	$665,600	$15,479	NO	---
				16	760	353+50	362+00										
	SA-CD3	Ground Mounted	West of SR 16 East of Soluna Apartments New Entrance	18	280	350+00	352+80	20	9	35	44	6.9	8.1	$748,800	$17,018	NO	---
				18	760	353+50	362+00										
	SA-CD4	Ground Mounted	West of SR 16 East of Soluna Apartments New Entrance	20	280	350+00	352+80	20	18	36	54	7.0	8.6	$832,000	$15,407	YES	---
				20	760	353+50	362+00										
	SA-CD5	Ground Mounted	West of SR 16 East of Soluna Apartments New Entrance	22	280	350+00	352+80	20	19	36	55	7.5	8.9	$915,200	$16,640	YES	Conceptual Barrier Design SA-CD5 recommended for further consideration and public input.
				22	760	354+40	362+00										

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Represents the conceptual noise barrier design recommended for further consideration and public input in the Final Design phase.