

DRAFT
Design
NOISE STUDY REPORT ADDENDUM

SUNCOAST PARKWAY 2 FROM SR 44 TO CR 486
Citrus County, Florida

Financial Project Identification (FPID) Number: 442764-1

Prepared for:



Florida's Turnpike Enterprise

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Prepared by:

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November 2020

Executive Summary

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) is conducting a design-level traffic noise study to determine the engineering and environmental effects of the proposed project for the Suncoast Parkway 2 (SR 589) Phase 2. The Suncoast Parkway 2 Phase 2 is a proposed limited-access facility, which will extend from the northern terminus of the existing Suncoast Parkway 2 (Phase 1) just south of SR 44 (West Gulf to Lake Highway) to CR 486 (West Norvell Bryant Highway).

This Design phase Noise Study includes a traffic noise analysis for residential and non-residential areas (i.e., special land uses) along the Preferred Alternative. The traffic noise study is completed in accordance with Title 23, Code of Federal Regulations, Part 772 (23 CFR 772), *Procedures for Abatement of Highway Traffic Noise and Construction Noise* following methodology and procedures established by the FDOT in the *PD&E Manual*, Part 2, Chapter 18 (*Highway Traffic Noise*). The purpose of this noise study is to identify noise sensitive sites that would be impacted by the proposed project, evaluate abatement measures at impacted noise sensitive sites and determine where noise abatement (i.e., noise barriers) needs to be included in the Design plans.

Noise levels were predicted at 58 receptor points representing 56 residences and two non-residential areas. For Design Year (2050) conditions, noise levels are not predicted to approach, meet, or exceed the Noise Abatement Criteria (NAC) at any receptor. However, compared to existing monitored conditions, substantial increases (i.e., a 15 dB[A] increase) in traffic noise are expected to occur at eleven (11) residences, as Suncoast Parkway 2 is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. However, noise barriers were not found to be reasonable or feasible forms of traffic noise abatement because they do not meet the criteria of reasonableness and/or feasibility to warrant the construction of a noise barrier and, therefore, were not recommended for this project. Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the eleven (11) impacted receptors.

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ACRONYMS

CFR	Code of Federal Regulations
CNE	Common Noise Environment
dB	Decibels
dB(A)	A-weighted decibels
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
Ft	Feet
FTE	Florida's Turnpike Enterprise
LOS	Level of Service
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NRDG	Noise Reduction Design Goal
NSR	Noise Study Report
NSRA	Noise Study Report Addendum
PD&E	Project Development and Environment
ROW	Right-of-way
SR	State Road
TNM	Traffic Noise Model

SECTION 1

Introduction

1.1 PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT), Florida's Turnpike Enterprise (FTE) is conducting a design-level study to determine the engineering and environmental effects of the proposed project for the Suncoast Parkway 2 Phase 2 (**Figure 1-1**). The Suncoast Parkway 2 (State Road [SR] 589) Phase 2 is a proposed limited-access facility, which will extend from the northern terminus of the existing Suncoast Parkway 2 (Phase 1) just south of SR 44 (West Gulf to Lake Highway) to CR 486 (West Norvell Bryant Highway).

In conjunction with the existing Suncoast Parkway and Veterans Expressway, the Suncoast Parkway 2 will provide a continuous limited-access toll road facility extending from Tampa to Citrus County. The roadway will be designed to accommodate future projected traffic volumes along the "Suncoast" corridor (Hillsborough, Pinellas, Pasco, Hernando, and Citrus Counties) as well as address deficiencies in the existing transportation network and will form an integral part of the Strategic Intermodal System (SIS).

The Suncoast Parkway 2 is classified as a rural freeway facility and will be designed with a posted speed limit of 70 mph. The roadway will initially be constructed with four 12-foot, median-separated travel lanes (two lanes in each direction). The median will be grassed. The ultimate condition will be eight 12-foot travel lanes (four lanes in each direction) separated by a median barrier wall). A 12-foot outside shoulder (10-foot paved) and an 8-foot inside shoulder (4-foot paved) will be provided. A 12-foot public multi-use trail (referred to as the Suncoast Trail) will also be constructed on the west side of the roadway. The right-of-way (ROW) for the Parkway will have a typical width of 300 feet. The ROW for the Suncoast Trail will have a width of 50 feet, providing a total ROW width for the project of 350 feet. The typical section of the project is shown in **Figure 1-2**.

The proposed roadway will extend over or under intersecting roadways and interchanges will be constructed at Suncoast Parkway 2 intersections with SR 44 and CR 486.

1.2 SUMMARY OF PD&E RESULTS AND COMMITMENTS

A Project Development and Environment (PD&E) study to evaluate noise sensitive areas and to determine if noise abatement is feasible and reasonable for the proposed Suncoast Parkway 2 was conducted by the FDOT FTE in October 1997. The PD&E study evaluated a four-lane divided limited-access toll facility from US 98 in Hernando County to US 19 in northwest Citrus County. Based on the PD&E study, traffic noise impacts were predicted from SR 44 to CR 486 at 24 residences in Lecanto Acres, 35 residences in Lecanto Hills Mobile Home Park (MHP), one residence along Maylen Ave/Horace Ave., seven residences in Tropical Highlands, and two residences south of CR 486. A 6m (19.7 ft.) high and 725 m (2,378 ft.) long noise barrier was recommended for the Lecanto Hills MHP. Noise barriers for other impacted receptors were not found to be reasonable or feasible.



Figure 1-1 Project Location Map

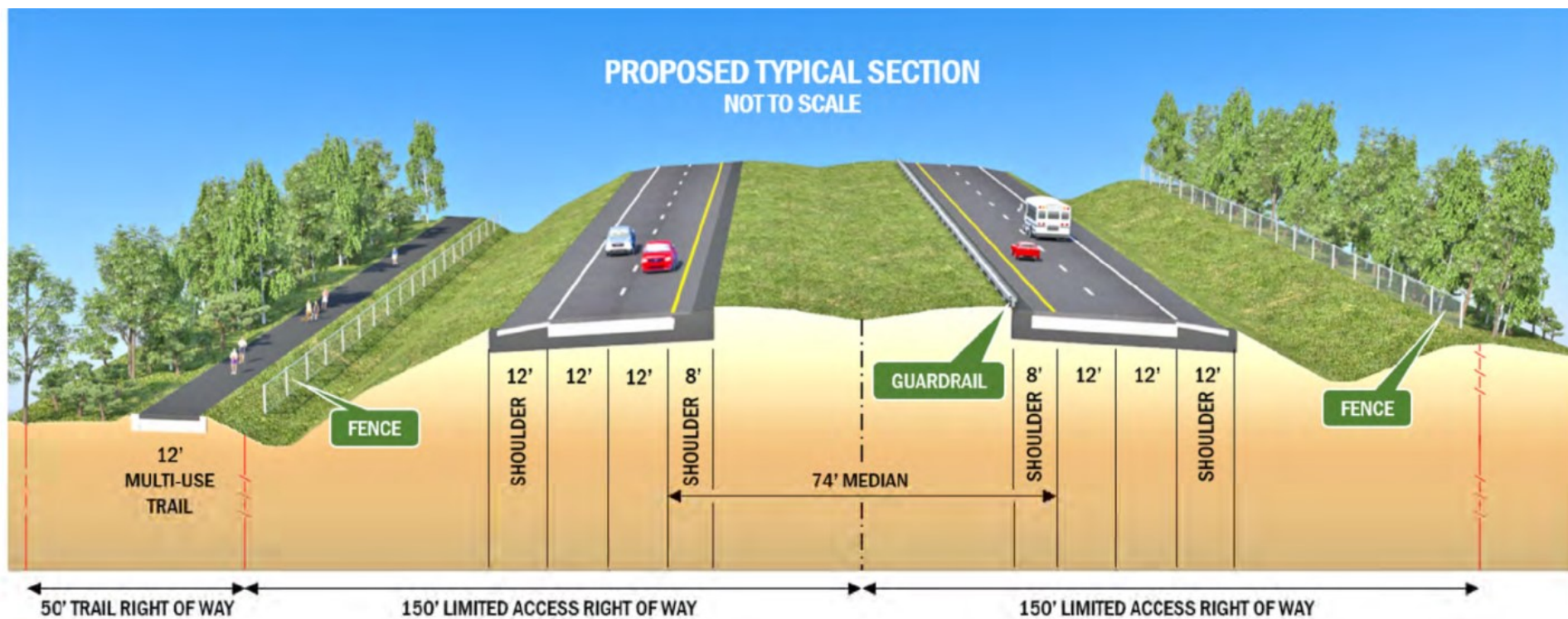


Figure 1-2 Proposed Typical Section (Looking North)

The 1997 PD&E traffic noise study was performed using the sunset STAMINA/OPTIMA computer model. Additionally, subsequent to the PD&E phase noise analysis, Title 23 Code of Federal Regulations Part 772 (23 CFR 772) was amended effective July 13, 2011. The FDOT's Noise Policy [currently FDOT's PD&E Chapter 18] was subsequently revised to comply with the changes to 23 CFR 772 (July 2011). The amended federal regulation identifies specific land uses as noise sensitive that were not previously considered (e.g., medical facilities, exterior areas of restaurants). Following the requirements of 23 CFR 772, this traffic noise study update was performed with the Federal Highway Administration's (FHWA's) Traffic Noise Model (TNM) and includes the specific land uses identified in the amended federal regulation.

SECTION 2

Methodology

This traffic noise study was performed in accordance with 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* using methodology established in the FDOT *PD&E Manual*, Part 2, Chapter 18 (*Highway Traffic Noise*) (FDOT, January 2019). Predicted noise levels were produced using the FHWA's TNM, version 2.5.

2.1 NOISE METRICS

Noise levels developed for this analysis are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. All reported noise levels are hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the requirements of 23 CFR 772.

2.2 TRAFFIC DATA

Among other factors, traffic noise is heavily dependent on both traffic speed and traffic volume with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increases. The traffic conditions that result in the highest noise levels for roadways are the hourly traffic volumes that represent Level of Service (LOS) C traffic conditions because they represent maximized traffic volumes that continue to travel at free flow speed.

Traffic data were reviewed to determine maximum traffic volumes that would allow traffic to flow at speeds consistent with established speed limits. Traffic data for the 2050 Build condition were provided by FTE and reviewed to identify forecasted traffic volumes that would allow vehicles to travel at speeds consistent with established speed limits. For roadway segments where the predicted hourly design year traffic volumes equaled or exceeded LOS C, LOS C hourly traffic was utilized. For roadway segments where the predicted hourly traffic demand was less than LOS C traffic volumes, the predicted hourly demand volumes were utilized. For ramp volumes, hourly traffic demand volumes were utilized. Traffic volumes and speeds used in the analysis are provided in **Appendix A**. In addition, the total vehicle volume is divided between five classifications: automobiles, medium trucks, heavy trucks, buses, and motorcycles. Traffic vehicle percentages used in the analysis are provided in **Appendix A**.

2.3 NOISE ABATEMENT CRITERIA

Noise sensitive sites are any property where frequent human use occurs and a lowered noise level would be of benefit. FHWA has established noise levels at which abatement is considered for various types of noise sensitive sites. These levels, which are used by the FTE for the purpose of evaluating traffic noise, are referred to as the Noise Abatement Criteria (NAC). As shown in **Table 2-1**, NAC vary by activity category (i.e., land use). Noise abatement measures are considered when predicted traffic noise levels for the

**Table 2-1
FHWA Noise Abatement Criteria**

Activity Category	Activity Leq(h)		Evaluation Location	Description of Land Use 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	67	66	Exterior	Residential.
C	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, recreation 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	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.

Source: 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, FHWA, 2010.

**Table 2-2
Typical Noise Levels**

Common Outdoor Activities	Noise Level dB(A)	Common Indoor Activities
Jet Fly-over at 1000 ft	---110---	Rock Band
Gas Lawn Mower at 3 ft	---100---	
Diesel Truck at 50 ft, at 50 mph	---90---	Food Blender at 3 ft
Noise Urban Area (Daytime)	---80---	Garbage Disposal at 3 ft
Gas Lawn Mower at 100 ft	---70---	Vacuum Cleaner at 10 ft
Commercial Area	---60---	Normal Speech at 3 ft
Heavy Traffic at 300 ft	---	Large Business Office
Quiet Urban Daytime	---50---	Dishwasher Next Room
Quiet Urban Nighttime	---40---	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	---30---	Library
Quiet Rural Nighttime	---20---	Bedroom at Night, Concert Hall (Background)
	---10---	
Lowest Threshold of Human Hearing	---0---	Lowest Threshold of Human Hearing

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

design year (2050) approach, meet, or exceed the NAC. FDOT defines “approach” as within 1 dB(A) of FHWA criteria. For perspective, **Table 2-2** provides typical noise levels of common indoor and outdoor activities.

Noise abatement measures must also be considered when a substantial increase in traffic noise will occur as a direct result of the transportation project. FDOT defines a substantial increase as 15 or more decibels above existing conditions. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project). Based on predictions made during the PD&E phase, substantial increases in noise are expected to occur in some areas since CPP is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise.

Common Noise Environments (CNEs) are studied separately. A CNE is a group of receptors of the same NAC that are exposed to noise in a similar way. These noise exposures are due to traffic mix, volume, speed and topographic features, and typically occur between two secondary noise sources such as interchanges, intersections, and crossroads.

2.4 NOISE ABATEMENT MEASURES

Noise abatement is considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC as stipulated by 23 CFR 772. Abatement measures considered during the PD&E phase included traffic management, alignment modifications, noise buffer zones through application of land use controls and noise barriers. However, noise barriers were determined to be the only viable noise abatement measure. Therefore, consistent with the results of the PD&E, noise barriers are considered at all noise sensitive sites predicted to approach, meet, or exceed the NAC for the year 2050 Build condition.

Barriers reduce noise levels by blocking the sound path between a highway and noise sensitive site. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no intermittent openings), and of sufficient height. For a noise barrier to be considered feasible and cost reasonable, the following minimum conditions should be met:

- At least two impacted receptors must be provided a noise reduction of 5 dB(A) or more to be considered feasible.
- A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefitted receptor must be achieved. Of importance, this receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction (first bullet).
- The cost of the noise barriers should not exceed \$42,000 per benefitted receptor. This is the upper cost limit established by FDOT. A benefitted receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is \$30 per square foot (sq. ft.).

Within the project limits, noise barrier locations were evaluated as follows:

- Right-of-way noise barriers located outside the clear recovery zone, but within the right-of-way (ROW), are initially considered at heights ranging from 8 ft. to 22 ft. in 2-ft. increments. According to the *FDOT Design Manual*, noise barriers outside the clear zone shall not exceed a maximum height of 22 ft.
- If a right-of-way barrier cannot provide at least a 5 dB(A) reduction to an impacted receptor or the barrier is not feasible due to construction limitations, then a shoulder barrier is evaluated. According to the *FDOT Design Manual*, shoulder barriers within the clear zone shall not exceed 14 ft. in height when on embankment and 8 ft. in height when on structure.
- The length and height of the noise barriers are optimized based on the benefit provided to noise sensitive sites with predicted noise levels that approach, meet, or exceed the NAC.

2.5 EXISTING CONDITONS

The 1997 PD&E phase noise study identified that substantial increases in traffic noise would occur at the Lecanto Mobile Home Park (i.e., location 6 of the 1997 PD&E NSR). Therefore, an evaluation of substantial increases was performed for this Design phase analysis. The Suncoast II Parkway is on a new alignment and traffic noise is not currently a prevalent noise source at some noise sensitive areas along the Preferred

Alternative. Therefore, noise monitoring was performed at representative locations to establish existing conditions where traffic noise is a minor component of the noise environment or where traffic data is not available to predict traffic noise originating from a nearby road.

Noise monitoring followed the procedures documented in FHWA's *Measurement of Highway-Related Noise*. Existing noise measurements were taken using a Quest Technologies Q-300 noise monitor, which was calibrated using a QC-10 calibrator. Noise sources during each monitoring event were noted to classify the various sources and assign a reasonable existing condition at noise sensitive locations based on physical conditions (e.g., characteristics of vegetation, presence of wildlife, types of man-made noise sources, etc.) and are found in **Appendix B**. Common natural noise sources included birds, other wildlife such as insects, and the effects of wind. Common man-made noise sources included airplanes, distant traffic, residential equipment (e.g., air conditioners, pool pumps) and noise generated by neighborhood activities.

Ambient noise monitoring results are provided in **Table 2-3**. The locations of ambient noise monitoring sites are shown in the aerial sheets found in **Appendix D**. Each noise sensitive site was assigned an existing noise level from a representative monitoring station's average LEQ based on the receptor's distance from existing roadway alignments (e.g., SR 44) and is provided in **Appendix C**.

Table 2-3 Ambient Noise Monitoring

Monitoring Site	Event	Duration	Date	Time	LEQ	Average LEQ	Field Notes
M1	C001	10 mins.	3/12/2020	11:00 AM	49.7	47.7	Occasional car on W. Sanction Rd., distant aircraft traffic, birds, car revving its engine for a short period of time, dog in distant background.
	C002			11:10 AM	47.4		
	C003			11:21 AM	45.9		
M2	C004	10 mins.	3/12/2020	12:00 PM	40.2	41.9	Crickets/bugs, very distant dog barking, very distant aircraft, light wind rustling trees, distant motorcycle.
	C005			12:10 PM	44.7		
	C006			12:21 PM	40.7		

Note: Ambient measurements were not able to be taken in areas near SR 44, as construction was taking place for Phase I of the Suncoast Parkway.

SECTION 3

Traffic Noise Analysis

3.1 PREDICTED NOISE LEVELS AND ABATEMENT ANALYSIS

Within the project limits, noise sensitive land uses adjacent to Suncoast Parkway 2 include residential areas and places of worship. Residential communities are in Activity Category B of the NAC, while the exterior-use areas of the places of worship are in Activity Category C of the NAC. Noise levels were predicted at 58 receptor points in total, which represent 56 residences and two places of worship affected by traffic noise.

The location of the receptor points representing the noise sensitive sites are in accordance with the FDOT *PD&E Manual*, Part 2, Chapter 18 (*Highway Traffic Noise*). Residential receptor points are located at the edge of the building closest to the proposed Suncoast Parkway 2.

Predicted noise levels for these sites are provided in **Appendix C**. The locations of the receptor points identified in **Appendix C** are depicted on the aerials found in **Appendix D**. The alphanumeric identification for each receptor point (e.g., E4, W13) associated with a noise sensitive site is formulated as follows:

- A “W” or “E” denotes which side of Suncoast Parkway 2 the receptor is located (e.g., W4). A “W” indicates that the receptor is located along the southbound lanes (i.e., west of Suncoast Parkway 2) while an “E” indicates that the receptor is located along the northbound lanes (i.e., east of Suncoast Parkway 2).
- The numbers identify a specific receptor point and generally increase from north to south.

For the year 2050 Build condition, traffic noise levels are not predicted to approach, meet, or exceed the NAC at any residence within the project limits. However, a substantial increase is predicted to occur at eleven (11) residences and are considered impacted. These impacted noise sensitive sites were evaluated to determine the feasibility and cost reasonableness of providing barriers to reduce traffic noise.

3.1.1 NOISE SENSITIVE SITES - WEST SIDE OF SUNCOAST PARKWAY 2

Predicted noise levels are not predicted to approach, meet, or exceed the NAC for 2050 Build condition at any receptor on the east side of Suncoast Parkway 2. However, a substantial increase is predicted to occur at five (5) residences and are considered impacted. All impacted noise sensitive sites were evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities along the west side (i.e., southbound lanes) of the proposed Suncoast Parkway 2 from north to south.

3.1.1.1 Residences along Old Citrus Rd.

Residences along Old Citrus Rd. (**Appendix D**, Aerial Sheet 1) are represented by three receptor points representing three residences (W1 through W3). Exterior traffic noise levels are predicted to range from 59.0 to 63.6 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence.

However, based on ambient measurements, a substantial increase is predicted to occur at all three residences. Therefore, a noise barrier was evaluated for these three impacted residences.

A ROW noise barrier was evaluated at heights ranging from 8 – 22 ft. The ROW noise barrier evaluation, shown in **Table 3-1**, found that ROW noise barriers ranging from 8-22 feet in height would provide a benefit to at least two impacted receptors and meets the NRDG, but were not cost reasonable. Additionally, a shoulder noise barrier ranging in height from 8-14 ft. was evaluated, shown in **Table 3-2**, and was found to also be not cost reasonable. Therefore, a noise barrier for the residences along Old Citrus Rd. is not recommended.

3.1.1.2 Isolated Residence along N. Tipton Terrace

An isolated residence exists along N. Tipton Terrace (**Appendix D**, Aerial Sheet 1). This residence is represented by one receptor point (W4). The exterior traffic noise level is predicted to be 56.9 dB(A) for the Design year and does not approach, meet or exceed the NAC at the residence. Additionally, a substantial increase is not predicted to occur at the residence. Therefore, a noise barrier for this residence was not evaluated.

3.1.1.3 Isolated Residences along W. Shady Knoll Pl.

An isolated residence exists along W. Shady Knoll Pl. (**Appendix D**, Aerial Sheet 2). This residence is represented by one receptor point (W5). The exterior traffic noise level is predicted to be 63.3 dB(A) for the Design year and does not approach, meet or exceed the NAC at the residence. In addition, although a substantial increase is predicted to occur at the residence, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. Therefore, a noise barrier for this residence was not evaluated.

3.1.1.4 Greek Orthodox Community of West Central Florida

The Greek Orthodox Community of West Central Florida (**Appendix D**, Aerial Sheet 2) is located along SR 44 and north of W. Shady Knoll Pl. This place of worship has an outside playground and was evaluated as an Activity Category C (exterior use) and was represented by one receptor (W6). The exterior traffic noise level at the place of worship is predicted to be 54.8 dB(A) for the Design year and does not approach, meet or exceed the NAC at the place of worship. Additionally, a substantial increase is not predicted to occur at the place of worship. Therefore, a noise barrier for this place of worship was not evaluated.

3.1.1.5 Residences along N. Maylen Ave. and W. Sanction Rd.

Residences along N. Maylen Ave. and W. Sanction Rd. (**Appendix D**, Aerial Sheets 3 and 4) are represented by five receptor points representing five residences (W7 through W10 and W12). Exterior traffic noise levels are predicted to range from 46.0 to 51.1 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Additionally, a substantial increase is not predicted to occur at any residence. Therefore, a noise barrier for these residences was not evaluated.

Table 3-1
Noise Barrier Analysis (ROW) – Residences Along Old Citrus Rd.

Barrier Height (feet)	Barrier Length ^{1,2} (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Number of Benefited Residences				Total Estimated Cost ⁵	Cost Per Benefited Residence	Cost Reasonable?
				5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)	Impacted ³	Other ⁴	Total	Average Reduction dB(A)			
8	NA	ROW	3	0	1	0	NA ^{6, 7}						
10	NA	ROW		0	0	1	NA ⁷						
12	200	ROW		1	0	1	2	0	2	6.1	\$224,640	\$112,320	No
	424												
14	200	ROW		1	0	1	2	0	2	6.7	\$262,080	\$131,040	No
	424												
16	666	ROW		2	0	1	3	0	3	6.8	\$681,600	\$227,200	No
	754												
18	466	ROW		2	0	1	3	0	3	6.9	\$496,800	\$165,600	No
	454												
20	466	ROW	2	0	1	3	0	3	7.2	\$552,000	\$184,000	No	
	454												
22	466	ROW	2	0	1	3	0	3	7.4	\$607,200	\$202,400	No	
	454												

¹ Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.

² Variation in the barrier length is a result of optimizing the length for a particular height.

³ Benefited residences with a predicted noise level that approaches or exceeds the NAC.

⁴ Benefited residences with a predicted noise level that does not approach the NAC.

⁵ Unit cost of \$30 per square foot of noise barrier.

⁶ NRDG not met.

⁷ Barrier does not provide a benefit to two (2) impacted receptors.

Table 3-2
Noise Barrier Analysis (Shoulder) – Residences Along Old Citrus Rd.

Barrier Height (feet)	Barrier Length ^{1,2} (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Number of Benefited Residences				Total Estimated Cost ⁵	Cost Per Benefited Residence	Cost Reasonable?
				5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)	Impacted ³	Other ⁴	Total	Average Reduction dB(A)			
8	2,941	Shoulder	3	2	0	1	3	0	3	5.9	\$705,840	\$235,280	No
10	1,728	Shoulder	3	2	0	1	3	0	3	5.8	\$518,400	\$172,800	No
12	1,349	Shoulder	3	2	0	1	3	0	3	6.2	\$485,640	\$161,880	No
14	1,248	Shoulder	3	2	0	1	3	0	3	6.2	\$524,160	\$174,720	No

¹ Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.

² Variation in the barrier length is a result of optimizing the length for a particular height.

³ Benefited residences with a predicted noise level that approaches or exceeds the NAC.

⁴ Benefited residences with a predicted noise level that does not approach the NAC.

⁵ Unit cost of \$30 per square foot of noise barrier.

3.1.1.6 Providence Baptist Church of Lecanto

The Providence Baptist Church of Lecanto (**Appendix D**, Aerial Sheet 2) is located along W. Sanction Rd. This place of worship has an outside playground and was evaluated as an Activity Category C (exterior) and was represented by one receptor (W11). The exterior traffic noise level at the place of worship is predicted to be 51.1 dB(A) for the Design year and does not approach, meet or exceed the NAC at the place of worship. Additionally, a substantial increase is not predicted to occur at the place of worship. Therefore, a noise barrier for this place of worship was not evaluated.

3.1.1.7 Residences along N. Carney Ave.

Residences along N. Carney Ave. (**Appendix D**, Aerial Sheet 4) were represented by seven receptor points representing seven residences (W13 through W19). Exterior traffic noise levels are predicted to range from 45.7 to 56.0 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Additionally, a substantial increase is not predicted to occur at these residences. Therefore, a noise barrier for these residences was not evaluated.

3.1.1.8 Isolated Residence along N. Crause Pt.

An isolated residence exists along N. Crause Pt. (**Appendix D**, Aerial Sheet 5). This residence is represented by one receptor point (W20). The exterior traffic noise level is predicted to be 52.0 dB(A) for the Design year and does not approach, meet or exceed the NAC at the residence. Additionally, a substantial increase is not predicted to occur at the residence. Therefore, a noise barrier for this residence was not evaluated.

3.1.1.9 Residences along W. Ziggy Street and N. Knoll Rd.

Residences along W. Ziggy Street and N. Knoll Rd. (**Appendix D**, Aerial Sheet 5) were represented by three receptor points representing three residences (W21 through W23). Exterior traffic noise levels are predicted to range from 48.6 to 57.6 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Additionally, a substantial increase is not predicted to occur at these residences. Therefore, a noise barrier for these residences was not evaluated.

3.1.2 NOISE SENSITIVE SITES - EAST SIDE OF SUNCOAST PARKWAY 2

Predicted noise levels are not predicted to approach, meet, or exceed the NAC for 2050 Build condition at any receptor on the east side of Suncoast Parkway 2. However, a substantial increase is predicted to occur at six (6) residences and are considered impacted. All impacted noise sensitive sites were evaluated to determine the feasibility and reasonableness of providing barriers to reduce traffic noise. The discussions that follow analyze residential communities along the east side (i.e., northbound lanes) of the proposed Suncoast Parkway 2 from north to south.

3.1.2.1 Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park

Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park (**Appendix D**, Aerial Sheet 1) were represented by 30 receptor points representing 30 residences (E1 through E30). Exterior traffic noise levels are predicted to range from 55.1 to 64.7 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. However, based on ambient measurements, a substantial increase is

predicted to occur at five (5) residences. Therefore, a noise barrier was evaluated for these five (5) impacted residences.

Conflicts with future ponds prevented a ROW barrier from extending east of receptor E10 and therefore did not provide enough benefits (i.e., 5 dB[A] reduction) to be considered cost reasonable (shown in **Table 3-3**). Therefore, a combination ROW and mainline shoulder noise barrier system was evaluated at heights ranging from 8 – 22 ft. along the ROW and 8-14 ft. along the shoulder of the mainline (shown in **Table 3-4**). Areas mounted on structure or mechanically stabilized earth (MSE) were limited to 8 ft. in height. However, the evaluation found that although the combination ROW and mainline shoulder noise barrier would provide a benefit to at least two impacted receptors and met the NRDG, the barrier system would not be cost reasonable. Therefore, a single shoulder barrier along the mainline was evaluated at heights ranging from 8 ft. to 14 ft. However, the shoulder barrier along the mainline did not provide a benefit to at least two impacted receptors, nor did it meet the NRDG.

Additionally, a combination ROW and exit ramp shoulder noise barrier system was evaluated at heights ranging from 8 – 22 ft. along the ROW and 14 ft. along the exit ramp to SR 44 (shown in **Table 3-5**). However, the evaluation found that although the combination ROW and shoulder noise barrier would provide a benefit to at least two impacted receptors and meets the NRDG, the barrier system would not be cost reasonable. Therefore, a single shoulder barrier along the exit ramp to SR 44 was evaluated at heights ranging from 8 ft. to 14 ft. However, the shoulder barrier along the exit ramp did not meet the NRDG at any height.

Therefore, based on the evaluation of several barrier heights, lengths and placements, a noise barrier for residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park is not recommended.

Table 3-3
Noise Barrier Analysis (ROW) – Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park

Barrier Height (feet)	Barrier Length ^{1, 2} (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Number of Benefited Residences				Total Estimated Cost ⁵	Cost Per Benefited Residence	Cost Reasonable?
				5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)	Impacted ³	Other ⁴	Total	Average Reduction dB(A)			
8	-	ROW	5	0	0	1	NA ⁶						
10	1,166	ROW		2	0	1	3	1	4	7.3	\$349,800	\$87,450	No
12	870	ROW		2	0	1	3	2	5	7.7	\$313,200	\$62,640	No
14	870	ROW		1	1	1	3	2	5	8.5	\$365,400	\$73,080	No
16	1,283	ROW		1	0	3	4	3	7	8.4	\$615,840	\$87,977	No
18	1,181	ROW		1	0	3	4	3	7	8.9	\$637,740	\$91,106	No
20	1,281	ROW		2	0	3	5	3	8	8.9	\$768,600	\$96,075	No
22	1,281	ROW		0	2	3	5	3	8	9.5	\$845,460	\$105,683	No

¹ Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.

² Variation in the barrier length is a result of optimizing the length for a particular height.

³ Benefited residences with a predicted noise level that approaches or exceeds the NAC.

⁴ Benefited residences with a predicted noise level that does not approach the NAC.

⁵ Unit cost of \$30 per square foot of noise barrier.

⁶ Barrier does not provide a benefit to two (2) impacted receptors.

Table 3-4
Noise Barrier Analysis (ROW and Mainline Shoulder) – Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park

Barrier Height (feet)	Barrier Length ^{1, 2} (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Number of Benefited Residences				Total Estimated Cost ⁵	Cost Per Benefited Residence	Cost Reasonable?
				5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)	Impacted ³	Other ⁴	Total	Average Reduction dB(A)			
8	870	ROW	5	3	0	2	5	0	5	6.4	\$859,800	\$171,960	No
8	1,550	Shoulder											
10	1,953	ROW		3	0	2	5	1	6	6.4	\$1,235,640	\$205,940	No
14	1,547	Shoulder											
8	103	Structure											
12	2,519	ROW		1	1	3	5	3	8	7.7	\$1,599,840	\$199,980	No
14	1,650	Shoulder											
8	309	Structure											
14	1,258	ROW		1	1	2	4	1	5	6.9	\$946,260	\$189,252	No
14	995	Shoulder											
16	910	ROW		2	0	3	5	1	6	7.1	\$854,700	\$142,450	No
14	995	Shoulder											
18	1,660	ROW		1	1	3	5	0	5	8.0	\$1,272,300	\$254,460	No
14	895	Shoulder											
20	987	ROW		2	0	3	5	0	5	7.6	\$968,100	\$193,620	No
14	895	Shoulder											
22	987	ROW		2	0	3	5	0	5	7.8	\$1,027,320	\$205,464	No
14	895	Shoulder											

¹ Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.

² Variation in the barrier length is a result of optimizing the length for a particular height.

³ Benefited residences with a predicted noise level that approaches or exceeds the NAC.

⁴ Benefited residences with a predicted noise level that does not approach the NAC.

⁵ Unit cost of \$30 per square foot of noise barrier.

Table 3-5
Noise Barrier Analysis (ROW and Exit Ramp Shoulder) – Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park

Barrier Height (feet)	Barrier Length ^{1, 2} (feet)	Barrier Location	Number of Impacted Residences	Number of Impacted Residences Within a Noise Reduction Range			Number of Benefited Residences				Total Estimated Cost ⁵	Cost Per Benefited Residence	Cost Reasonable?
				5-5.9 dB(A)	6-6.9 dB(A)	≥ 7 dB(A)	Impacted ³	Other ⁴	Total	Average Reduction dB(A)			
8	551	ROW	5	2	1	1	4	0	4	6.2	\$514,020	\$128,505	No
14	909	Shoulder		2	1	1	4	0	4	6.5	\$547,080	\$136,770	No
10	551	ROW		2	0	2	4	0	4	7.2	\$569,160	\$142,290	No
14	909	Shoulder		2	1	1	4	0	4	6.8	\$563,640	\$140,910	No
12	433	ROW		2	1	1	4	0	4	6.8	\$589,620	\$147,405	No
14	984	Shoulder		2	1	1	4	0	4	6.9	\$615,600	\$153,900	No
14	433	ROW		2	1	1	4	0	4	6.9	\$641,580	\$160,395	No
14	909	Shoulder		2	0	2	4	0	4	7.5	\$1,261,860	\$315,465	No
16	433	ROW											
14	909	Shoulder											
18	433	ROW											
14	909	Shoulder											
20	433	ROW											
14	909	Shoulder											
22	1,560	ROW											
14	553	Shoulder											

¹ Full height is for the length indicated. If a shoulder noise barrier location is indicated, the length of vertical height tapers at the shoulder barrier's terminus (See FDOT Standard Plans) would be in addition to the length indicated.

² Variation in the barrier length is a result of optimizing the length for a particular height.

³ Benefited residences with a predicted noise level that approaches or exceeds the NAC.

⁴ Benefited residences with a predicted noise level that does not approach the NAC.

⁵ Unit cost of \$30 per square foot of noise barrier.

3.1.2.2 Residences along N. Maylen Ave. and W. Sanction Rd.

Residences along N. Maylen Ave. and W. Sanction Rd. (**Appendix D**, Aerial Sheet 3) were represented by three receptor points representing three residences (E31 through E33). Exterior traffic noise levels are predicted to range from 55.2 to 58.9 dB(A) for the Design year and do not approach, meet or exceed the NAC at any residence. Additionally, a substantial increase is not predicted to occur at any residence. Therefore, a noise barrier was not evaluated for these residences.

3.1.2.3 Residences along W. Ziggy St.

Residences along W. Ziggy St. (**Appendix D**, Aerial Sheet 5) were represented by two receptor points representing two residences (E34 and E35). Exterior traffic noise levels are predicted to range from 52.3 to 59.7 dB(A) for the Design year and do not approach, meet or exceed the NAC at either residence. In addition, although a substantial increase is predicted to occur at one residence, because FDOT policy requires two impacted receptors to be benefited by a 5 dB(A) reduction in order for a barrier to be feasible, a barrier is not considered a feasible abatement measure for the impacted residence. Therefore, a noise barrier was not evaluated for this impacted residence.

SECTION 4

Conclusions

4.1 TRAFFIC NOISE IMPACTS

Noise levels were predicted at 58 receptor points representing 56 residences and two non-residential areas. For Design Year (2050) conditions, noise levels are not predicted to approach, meet, or exceed the NAC at any receptor. However, compared to existing monitored conditions, substantial increases (i.e., a 15 dB[A] increase) in traffic noise is expected to occur at eleven (11) residences, as Suncoast Parkway 2 is a new alignment highway which would be located in proximity to noise sensitive areas not currently affected by traffic noise. However, noise barriers were not found to be a reasonable or feasible forms of traffic noise abatement because they do not meet the criteria of reasonableness and/or feasibility to warrant the construction of a noise barrier and, therefore, were not recommended for this project. Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the eleven(11) impacted receptors

SECTION 5

Construction Noise and Vibration

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements will not have any noise or vibration impact. If noise-sensitive land uses develop adjacent to the roadway prior to construction, additional impacts could result. It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the FTE Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

SECTION 6

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; pages 39834-39839.
- Florida Department of Transportation, *"A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations"*, July 2009. 64 pages.
- Florida Department of Transportation. *"Highway Traffic Noise"*, Part 2, Chapter 18. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 1, 2020.
- Florida Department of Transportation Design Manual Volume 1, Chapter 264, *"Noise Walls and Perimeter Walls"*, January 2020.
- Florida Department of Transportation *"Standard Specifications for Road and Bridge Construction"*, January 2020.
- Florida Department of Transportation, *"2012 FDOT Quality/Level of Service Handbook"*; Tallahassee, Florida; 2012.
- Florida Department of Transportation, *"FDOT Design Manual"*, Tallahassee, Florida; 2019.
- Federal Highway Administration Report FHWA-HEP-10-025, *"Highway Traffic Noise: Analysis and Abatement Guidance"*, June 2010 (revised December 2010); 76 pages.
- Federal Highway Administration Report FHWA-PD-96-009, *"FHWA Traffic Noise Model, Version 1.0 User's Guide"*, January 1998; 192 pages + supplements.
- Federal Highway Administration Report Number FHWA-PD-96-046, *"Measurement of Highway-Related Noise"*, Cynthia S.Y. Lee and Gregg Fleming; May 1996; 206 pages.
- Federal Highway Administration Report FHWA-HEP-06-015, *"FHWA Highway Construction Noise Handbook: Final Report"*. August 2006; 185 pages.
- Federal Highway Administration. *"Consideration of Existing Noise Barrier in a Type I Noise Analysis FHWA-HEP-12-051."*
https://www.fhwa.dot.gov/ENVIRONMENT/noise/noise_barriers/abatement/existing.cfm. Accessed May 6, 2019.

APPENDICES

Appendix A Traffic Data

Appendix B Ambient Noise Measurements

Appendix C Predicted Noise Levels

Appendix D Aerials

Appendix E TNM Files

APPENDIX A

TRAFFIC DATA

Traffic Data – Suncoast Parkway 2 From SR 44 to CR 486
Build (2050) Conditions

Suncoast Parkway Mainline													
Mainline Segment	Number of Lanes	AADT	LOS C AADT	Peak Hour Peak Direction	LOS C Peak Hour Peak Direction	Design Hr. % Trucks	Design Hr. % MT	Design Hr. % HT	Design Hr. % Buses	Design Hr. % Motorcycles	Standard K-factor	D-factor	Posted Speed (mph)
Suncoast Parkway (S.R. 589)													
From S.R. 44 (MP 68) to C.R. 486 (MP 70)	4	8,300	47,400	450	2,740	3.80%	1.64%	2.06%	0.09%	0.11%	10.5%	55.0%	70
South of S.R. 44 (MP 68)	4	17,000	47,400	910	2,740	3.80%	1.64%	2.06%	0.09%	0.11%	10.5%	55.0%	70
Suncoast Parkway Ramps													
Interchange Ramp	Number of Lanes	One-Way AADT	One-Way LOS C AADT	Peak Hour Peak Direction	LOS C Peak Hour Peak Direction	Design Hr. % Trucks	Design Hr. % MT	Design Hr. % HT	Design Hr. % Buses	Design Hr. % Motorcycles	K-factor	D-factor	Posted Speed (mph)
S.R. 44 (MP 68)													
Northbound On-ramp	1	1,250	11,400	140	1,320	3.37%	1.69%	1.56%	0.13%	0.25%	10.5%	55.0%	45
Southbound Off-ramp	1	1,250	11,400	140	1,320	3.37%	1.69%	1.56%	0.13%	0.25%	10.5%	55.0%	45
Northbound Off-ramp	1	5,600	11,400	600	1,320	3.37%	1.69%	1.56%	0.13%	0.25%	10.5%	55.0%	45
Southbound On-ramp	1	5,600	11,400	600	1,320	3.37%	1.69%	1.56%	0.13%	0.25%	10.5%	55.0%	45
C.R. 486 (MP 70)													
Northbound Off-ramp	1	4,150	11,400	450	1,320	4.05%	2.05%	1.87%	0.13%	0.30%	10.5%	55.0%	40
Southbound On-ramp	1	4,150	11,400	440	1,320	4.05%	2.05%	1.87%	0.13%	0.30%	10.5%	55.0%	35
Arterials													
Arterial Segment	Number of Lanes	AADT	LOS C AADT	Peak Hour Peak Direction	LOS C Peak Hour Peak Direction	Design Hr. % Trucks	Design Hr. % MT	Design Hr. % HT	Design Hr. % Buses	Design Hr. % Motorcycles	K-factor	D-factor	Posted Speed (mph)
S.R. 44													
East of Suncoast Parkway	4	30,900	30,400	1,550	1,530	3.37%	1.69%	1.56%	0.13%	0.25%	9.5%	53.0%	55
West of Suncoast Parkway	4	32,800	30,400	1,650	1,530	3.37%	1.69%	1.56%	0.13%	0.25%	9.5%	53.0%	55
C.R. 486													
East of Suncoast Parkway	4	21,700	30,200	1,090	1,520	4.05%	2.05%	1.87%	0.13%	0.30%	9.5%	53.0%	50
West of Suncoast Parkway	4	23,000	30,200	1,160	1,520	4.05%	2.05%	1.87%	0.13%	0.30%	9.5%	53.0%	50

Note: AADT: Annual Average Daily Traffic; MT: Medium Trucks; HT: Heavy Trucks.

(1) Number of lanes were obtained from the aerial maps and design layouts.

(2) Traffic data was obtained from the traffic forecast developed for the project.

(3) Peak hour demand and LOS C Peak Hour maximum service volumes are provided directionally.

(4) LOS C targets were based on the 2013 FDOT Quality and LOS Handbook, and adjusted for local conditions.

(5) LOS C AADTs were estimated using K and D factors and the design hour peak direction LOS C maximum service volumes.

(6) Truck percentages were obtained from the Florida Traffic Online application for the Portable Traffic Monitoring Sites (PTMS) 02-1006 and 02-9041.

(7) Posted speed for existing facilities (arterials) was obtained from field observations. Posted speed for Suncoast Parkway was based on design.

APPENDIX B

AMBIENT NOISE MEASUREMENTS

Providence Baptist Church corner lot

Ambient Monitoring Data Sheet			
	Morning Events		Afternoon Events
Date	3/12/20		
Time	11:00 ; 11:10 ; 11:21 AM		
Monitor #	#1		
Event #	C001, C002, C003		
Location Description and Latitude & Longitude	Providence Baptist Church parking lot corner		
Event Duration	10 mins each		
Event #1	occasional car on W Section Rd distant airplane traffic birds car revving engine 4 mins in birds chirping dog in distant background		
Noise Environment Sources	<div> <div>Event #2</div> <div>↑</div> </div> <div> <div>Event #3</div> <div>↑</div> </div>		
	1	2	3
Final LEQ	49.7	47.4	45.9
Weather			
Temperature	78°F		
Humidity	50%		
Wind Speed	1-2 mph		
Wind Direction	? too light to tell		
Cloud Cover	5%		

Ambient Monitoring Data Sheet				
	Morning Events			Afternoon Events
Date	3/12/20			
Time	12:00; 12:00 PM			
Monitor #	#1			
Event #	C004, C005, C006			
Location Description and Latitude & Longitude	Ziggy St. & Knoll Rd			
Event Duration	10 mins each			
Noise Environment Sources	<div>C004</div> <div>C005</div> <div>C006</div> crickets/Bugs Very distant dog barking very distant planes distant plane and one helicopter one distant crow Bugs, Crow light wind rustling trees 1 small truck passed by on Knoll Rd distant motorcycle.			
	1	2	3	
Final LEQ	40.2	44.7	40.7	
Weather				
Temperature	82°F			
Humidity	42%			
Wind Speed	1-2 mph			
Wind Direction	? too light to tell			
Cloud Cover	30%			

APPENDIX C

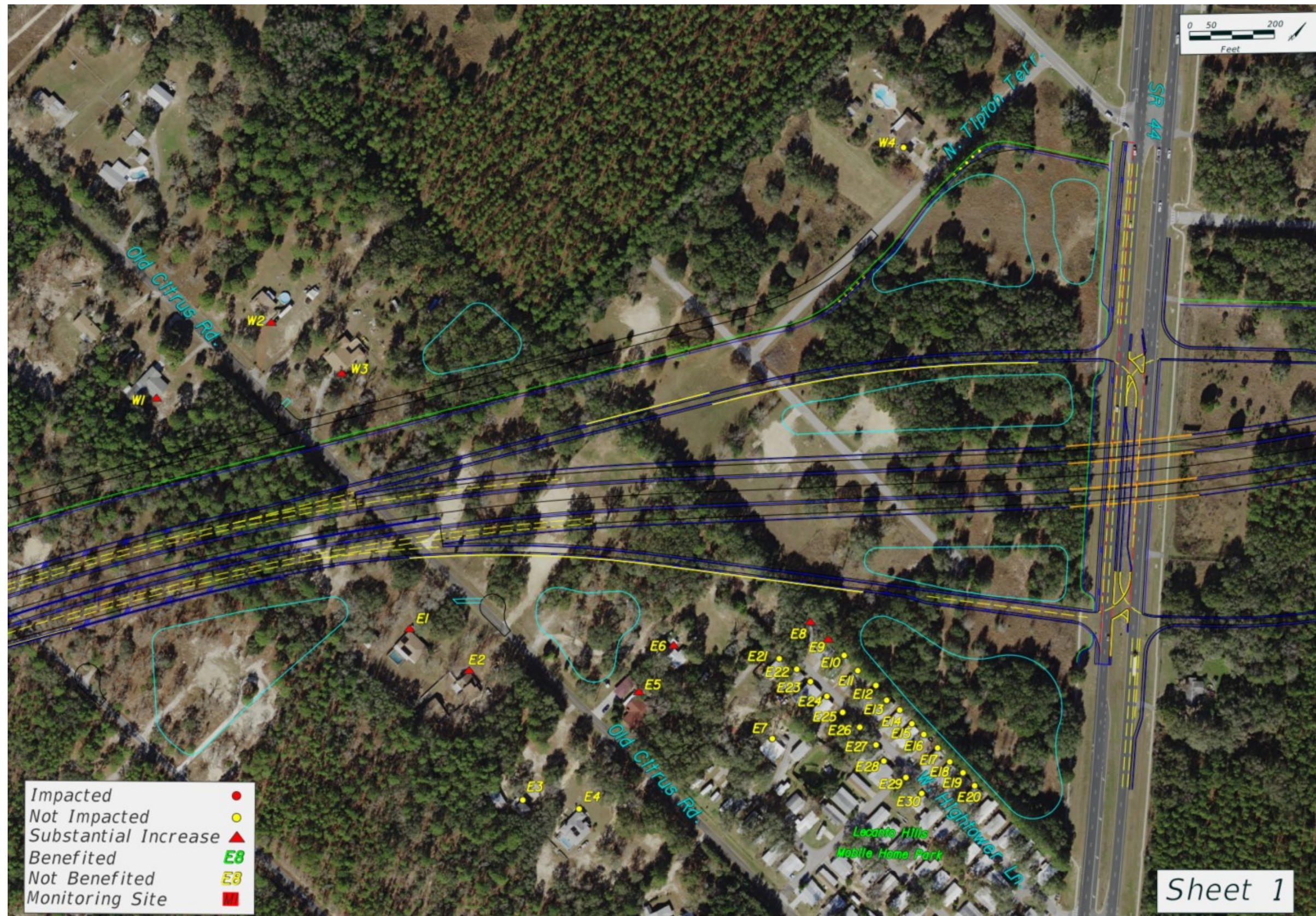
PREDICTED NOISE LEVELS

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2050 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
Residences along Old Citrus Rd.	1	RW1	B	Residential	1	61.2	NO	2	41.9	19.3	YES
	1	RW2	B	Residential	1	59.0	NO	2	41.9	17.1	YES
	1	RW3	B	Residential	1	63.6	NO	2	41.9	21.7	YES
Residence along N. Tipton Terr.	1	RW4	B	Residential	1	56.9	NO	1	47.7	9.2	NO
Residence along Shady Knoll Pl.	2	RW5	B	Residential	1	63.3	NO	1	47.7	15.6	YES
Greek Orthodox Community of West Central Florida	2	RW6	C	Place of Worship	0	54.8	NO	1	47.7	7.1	NO
Residences along N. Maylen Ave. and W. Sanction Rd.	2	RW7	B	Residential	1	51.1	NO	1	47.7	3.4	NO
	3	RW8	B	Residential	1	48.9	NO	1	47.7	1.2	NO
	3	RW9	B	Residential	1	49.4	NO	1	47.7	1.7	NO
	3	RW10	B	Residential	1	49.1	NO	1	47.7	1.4	NO
	4	RW12	B	Residential	1	51.1	NO	1	47.7	3.4	NO
Providence Baptist Church of Lecanto	3	RW11	C	Place of Worship	0	46.0	NO	1	47.7	-1.7	NO
Residences along N. Carney Ave.	4	RW13	B	Residential	1	47.0	NO	1	47.7	-0.7	NO
	4	RW14	B	Residential	1	49.5	NO	1	47.7	1.8	NO
	4	RW15	B	Residential	1	45.7	NO	1	47.7	-2.0	NO
	4	RW16	B	Residential	1	51.9	NO	1	47.7	4.2	NO
	4	RW17	B	Residential	1	48.3	NO	1	47.7	0.6	NO
	4	RW18	B	Residential	1	56.0	NO	1	47.7	8.3	NO
	4	RW19	B	Residential	1	47.0	NO	1	47.7	-0.7	NO
Residence along N. Crause Pt.	5	RW20	B	Residential	1	52.0	NO	2	41.9	10.1	NO
Residences along W. Ziggy St. and N. Knoll Rd.	5	RW21	B	Residential	1	53.3	NO	2	41.9	11.4	NO
	5	RW22	B	Residential	1	48.6	NO	2	41.9	6.7	NO
	5	RW23	B	Residential	1	57.6	NO	2	41.9	15.7	YES
Residences along Old Citrus Rd. and Lecanto Hills Mobile Home Park	1	RE1	B	Residential	1	64.7	NO	2	41.9	22.8	YES
	1	RE2	B	Residential	1	60.9	NO	2	41.9	19.0	YES
	1	RE3	B	Residential	1	55.3	NO	2	41.9	13.4	NO
	1	RE4	B	Residential	1	55.1	NO	2	41.9	13.2	NO
	1	RE5	B	Residential	1	60.5	NO	2	41.9	18.6	YES
	1	RE6	B	Residential	1	60.3	NO	2	41.9	18.4	YES
	1	RE7	B	Residential	1	57.0	NO	1	47.7	9.3	NO
	1	RE8	B	Residential	1	64.7	NO	1	47.7	17.0	YES
	1	RE9	B	Residential	1	62.9	NO	1	47.7	15.2	YES
	1	RE10	B	Residential	1	61.1	NO	1	47.7	13.4	NO
	1	RE11	B	Residential	1	60.5	NO	1	47.7	12.8	NO
	1	RE12	B	Residential	1	60.2	NO	1	47.7	12.5	NO
	1	RE13	B	Residential	1	59.8	NO	1	47.7	12.1	NO
	1	RE14	B	Residential	1	59.8	NO	1	47.7	12.1	NO
	1	RE15	B	Residential	1	59.8	NO	1	47.7	12.1	NO

Noise Sensitive Area	Aerial Sheet Number	Receptor ID	Activity Category	Property Type	Number of Residences Represented	2050 Build Condition dB(A)	NAC Approached or Exceeded?	Monitoring Station Assigned to establish Existing Conditions	Monitoring Site Noise Level dB(A)	Increase from Existing Conditions	Substantial Increase?
	1	RE16	B	Residential	1	59.9	NO	1	47.7	12.2	NO
	1	RE17	B	Residential	1	59.7	NO	1	47.7	12.0	NO
	1	RE18	B	Residential	1	59.7	NO	1	47.7	12.0	NO
	1	RE19	B	Residential	1	60.0	NO	1	47.7	12.3	NO
	1	RE20	B	Residential	1	60.3	NO	1	47.7	12.6	NO
	1	RE21	B	Residential	1	60.1	NO	#N/A	47.7	12.4	NO
	1	RE22	B	Residential	1	59.7	NO	#N/A	47.7	12.0	NO
	1	RE23	B	Residential	1	59.5	NO	#N/A	47.7	11.8	NO
	1	RE24	B	Residential	1	59.2	NO	#N/A	47.7	11.5	NO
	1	RE25	B	Residential	1	59.1	NO	#N/A	47.7	11.4	NO
	1	RE26	B	Residential	1	58.9	NO	#N/A	47.7	11.2	NO
	1	RE27	B	Residential	1	58.8	NO	#N/A	47.7	11.1	NO
	1	RE28	B	Residential	1	58.9	NO	#N/A	47.7	11.2	NO
	1	RE29	B	Residential	1	58.6	NO	#N/A	47.7	10.9	NO
	1	RE30	B	Residential	1	58.4	NO	#N/A	47.7	10.7	NO
Residences along N. Maylen Ave. and W. Sanction Rd.	3	RE31	B	Residential	1	57.3	NO	#N/A	47.7	9.6	NO
	3	RE32	B	Residential	1	58.9	NO	#N/A	47.7	11.2	NO
	3	RE33	B	Residential	1	55.2	NO	#N/A	47.7	7.5	NO
Residences along W. Ziggy St.	5	RE34	B	Residential	1	52.3	NO	#N/A	47.7	4.6	NO
	5	RE35	B	Residential	1	59.7	NO	#N/A	47.7	12.0	NO

APPENDIX D

AERIALS









Sheet 4





APPENDIX E

TNM Files

TNM Files provided in the Project File.