DRAFT NOISE STUDY REPORT

Florida Department of Transportation

District 1

SR 31 PD&E Study

Limits of Project: SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)

Lee County, Florida

Financial Management Number: 441942-1-22-01

ETDM Number: 14359

Date: September 27, 2023

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 the Federal Highway Administration and FDOT.

Project Development and Environment Study

State Road 31

From State Road 80 (Palm Beach Boulevard) to State Road 78 (Bayshore Road)

DRAFT NOISE STUDY REPORT

Financial Project ID: 441942-1-22-01
ETDM No.: 14359
Lee County, Florida

Prepared for the:

Florida Department of Transportation
District One

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September 2023

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Executive Summary

The Florida Department of Transportation (FDOT), District One (Department) is conducting a Project Development and Environment (PD&E) Study in accordance with the National Environmental Policy Act (NEPA) to evaluate capacity, operational, structural, and modal improvements to about 1.4 miles of State Road (SR) 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road) in northeastern Lee County. The study includes the evaluation of capacity improvements to its current two-lane configuration, as well as pedestrian and bicycle accommodations. The study also includes evaluating repair/rehabilitation and replacement options for the Wilson Pigott Bridge over the Caloosahatchee River and improvement alternatives for the SR 31/SR 80 intersection.

The purpose of this Noise Study Report (NSR) is to identify noise sensitive land uses, which are properties adjacent to the project corridor for which there are Noise Abatement Criteria (NAC); to evaluate future traffic noise levels at the properties with and without the proposed improvements, and to evaluate the need for, and effectiveness of, noise abatement measures. Additional objectives include the consideration of potential construction noise impacts and the identification of noise impact contours adjacent to the corridor.

The analysis was performed following FDOT procedures that comply with Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) - Procedures for Abatement of Highway Traffic Noise and Construction Noise. The evaluation uses methodologies established by the FDOT's Noise Policy (FDOT PD&E Manual – Highway Traffic Noise), and the FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook and A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations document.

Thirty-three receptors (discrete/representative locations of a noise sensitive area) were evaluated. The receptors represented 45 residences, three outdoor dining areas, an active sports area (a golf course), a medical facility (dental office), and a fire station for a total of 51 properties. The residences were evaluated as an Activity Category B land use (an exterior NAC of 66 decibels on the "A"-weighted scale (dB(A)). The outdoor dining areas were evaluated as Activity Category E (an exterior NAC of 71 dB(A)). The golf course was evaluated as an Activity Category C land use (an exterior NAC of 66 dB(A)). Because there are no exterior areas of frequent human use, the medical facility and the fire station were evaluated as Activity Category D (an interior NAC of 51 dB(A)).

The results of the analysis indicate that the existing (year 2019) exterior traffic noise levels range from 44.6 to 66.1 dB(A), and the interior traffic noise levels at the medical facility and the fire station are predicted to be 34.6 and 43.5 dB(A), respectively. In the future (year 2045) without the proposed project improvements (the No-Build Alternative), exterior traffic noise levels are predicted to range from 46.9 to 66.1 dB(A), and the interior levels at the medical facility and the fire station are predicted to be 35.5 and 43.5 dB(A), respectively. In the future with the proposed project improvements (the Preferred Alternative), exterior traffic noise levels are predicted to range from 53.3 to 65.8 dB(A), and the interior levels at the medical facility and the fire station are predicted to be 36.4 and 42.6 dB(A), respectively.

Based on these results, highway traffic noise levels do not approach, meet, or exceed the NAC in the future with the proposed project improvements at any of the evaluated receptors. The results of the analysis also indicate that when compared to existing conditions, traffic noise levels with the proposed improvements

would not increase more than 9.5 dB(A) at any receptor. As such, the project would not substantially increase highway traffic noise (i.e., an increase of 15 dB(A) or more).

Based on the results of the PD&E Study, there are no highway traffic noise impacted land uses within the project area that require abatement consideration. Should the proposed improvements change during the project's final design phase such that a re-analysis of highway traffic noise is warranted, and impacts are identified in the analysis, an evaluation of noise abatement measures would be performed at that time. The FDOT is committed to the construction of feasible and reasonable noise abatement measures at noise-impacted locations contingent on the following:

1. Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;
2. Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
3. Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Office; and
4. Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

The residences and the medical facility within the project limits are considered to be construction noise and vibration sensitive sites. Implementing the proposed roadway improvements is not expected to have a significant noise or vibration impact on these sites because it is anticipated that application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate the potential for such impacts. Should unanticipated noise or vibration issues arise during the construction process, the Project Engineer, in coordination with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

Land uses such as residences, motels, medical facilities, schools, churches, recreation areas, and parks are considered incompatible with highway traffic noise levels that approach, meet, or exceed the NAC. In order to reduce the possibility of noise-related impacts on land uses that may be approved for construction in the future, noise level contours were developed for the future improved roadway facility. Local officials will be provided a copy of the NSR that delineates/illustrates the contours to promote compatibility between land development and the proposed improvements.

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1.0 Project Overview

The FDOT, District One (Department) is conducting a Project Development and Environment (PD&E) Study in accordance with the National Environmental Policy Act (NEPA) to evaluate capacity, operational, structural, and modal improvements to about 1.4 miles of State Road (SR) 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road) in northeastern Lee County (see **Figure 1**). The study includes the evaluation of capacity improvements to its current two-lane configuration, as well as pedestrian and bicycle accommodations. The study also includes evaluating repair/rehabilitation and replacement options for the Wilson Pigott Bridge over the Caloosahatchee River and improvement alternatives for the SR 31/SR 80 intersection.

The Department is coordinating with adjacent studies, including the SR 78 PD&E Study, the SR 31 North Design-Build project, and the pending Babcock Ranch development.

1.1 Existing Facility and Conditions

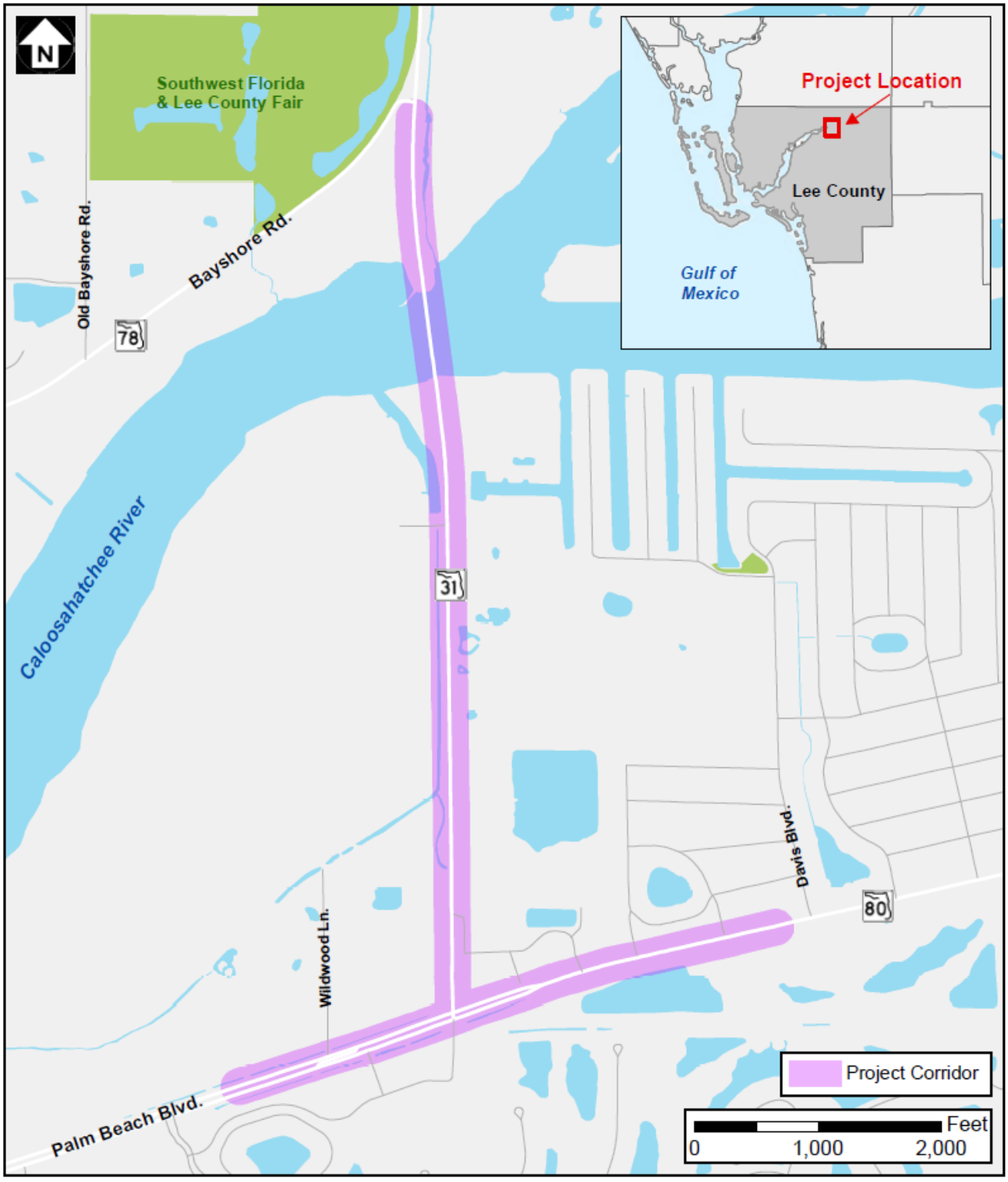
SR 31 in the project study area is classified by the Department as an Urban Minor Arterial. SR 31 is considered an Emerging Strategic Intermodal System (SIS) Corridor. The existing typical section is a two-lane, undivided rural roadway with two 12-foot travel lanes and 5-foot paved outside shoulders centered within a 100-foot right-of-way. The existing bridge is a 14-span low-level bascule structure with 10-foot lanes, 4-foot outside shoulders, and 3.5-foot raised sidewalks on both sides with no separation from motor vehicles. The existing vertical clearance over the channel is 26 feet.

The posted speed limit in this section of SR 31 is 40 mph. The surrounding land uses are a mixture of rural residential, commercial, and undeveloped land. The Lee County Future Land Use map (as of January 2022) reveals that most of the study area is zoned as “Future Urban Areas-Suburban”. “Sub-Outlying Suburban”, “Non-Urban Areas-Rural”, and “Environmentally Critical Areas-Wetlands” designations are also in the project vicinity.

Stormwater runoff is collected in open drainage swales adjacent to the roadway with ultimate outfall to the Caloosahatchee River. SR 31 has no existing stormwater management facilities. The project is located within WBID 3240C, which is impaired for Nutrients. There are four cross drains within the project limits.

1.2 Purpose and Need

The purpose of the project is to address capacity, operational, and structural deficiencies of SR 31 from SR 80 to SR 78 in northeastern Lee County. To meet future travel demand, the project will evaluate potential widening improvements to its current two-lane configuration, including paved shoulders, sidewalks, bike lanes, and/or a multi-use pathway. Repair/rehabilitation and replacement options for the Wilson Pigott Bridge will also be evaluated as part of the project, as design elements of the bridge are substandard.



FDOT	**State Road 31 from State Road 80 to State Road 78** FPID: 441942-1-22-01 Lee County, FL	**Project Location** DATA SOURCE: Aerial Map - ESRI 2023 **May 2023**	Figure **1**

The need for the project is based on the following primary and secondary criteria:

PRIMARY CRITERIA

CAPACITY/TRANSPORTATION DEMAND: Improve Operational Conditions
The existing year [2022] Annual Average Daily Traffic (AADT) volume for the SR 31 project corridor is 16,600 vehicles per day (vpd), operating at Level of Service (LOS) C. As SR 31 is a designated highway corridor of Florida's Emerging SIS and a Tier I Freight Corridor of Lee County, approximately 25% of existing traffic along the roadway is composed of trucks. The SIS network includes the state's most significant transportation facilities, as these facilities carry the highest volumes of freight and commuter traffic. The projected demand along the corridor exceeds the maximum threshold of 20,000 AADT for a two-lane facility. As an Emerging SIS facility, LOS D is the minimum acceptable LOS for SR 31. Without capacity improvements, the corridor is projected to operate at LOS F.

Much of the growth contributing to the increase in traffic comes from the Babcock Ranch Development of Regional Impact (DRI) located to the north of the SR 31 project segment. Although the Babcock Ranch DRI is in Charlotte County, some development is expected to occur in Lee County, such as the Babcock Ranch Mixed-use Planned Development (MPD) and a marina to be sited northeast of the project corridor. The Babcock Ranch DRI and MPD is approved for 19,500 residential dwelling units, almost 5 million square feet of office and retail space, and 600 hotel rooms. In addition, the DRI is approved for 650,000 square feet of industrial space, which will further increase the volume of trucks moving freight along the corridor. Also, eight Planned Unit Developments exist or are proposed along the SR 31 project segment, including a mixed-use development southeast of SR 31 and SR 80. The Sweetwater Landing Marina, located along the corridor, has expanded operations.

Increased congestion along SR 31 between SR 80 and SR 78 is anticipated due to this noted growth. Conditions along the roadway will be exacerbated if no improvements occur because the roadway lacks the operational capacity to accommodate future travel demand. In addition, freight traffic and multimodal activity are expected to increase along the corridor due to projected growth in the area.

SUBSTANDARD BRIDGE ELEMENTS: Address Mechanical Malfunctions & Design Deficiencies
The Wilson Pigott Bridge was constructed in 1960 and has exceeded its fifty-year design life. Based on a FDOT bridge inspection report conducted in October 2021, the Wilson Pigott Bridge received a sufficiency rating of 52.0 (on a scale of 0-100). Sufficiency rating is essentially an overall rating of a bridge's fitness to remain in service. A sufficiency rating below 50.0 qualifies a bridge for replacement funds. The bridge inspection report also revealed a health index of 95.52 for the Wilson Pigott Bridge. The health index uses the condition rating of several important bridge components to develop a number from 1 to 100. The lower the number, the more work is required to improve the bridge's overall condition. Below 85 generally means repairs are needed. A low health index may also indicate that it would be more economical to replace the bridge than to repair it. Additionally, an interview conducted with Lee County Metropolitan Planning Organization (MPO) staff in February 2018 indicated that the Wilson Pigott Bridge frequently experiences mechanical malfunctions leaving the bascule span in the up position, disrupting traffic flow and circulation in the area.

Although the current bridge inspection report indicates a health index over 90 due to the most recent bridge repairs, the bridge has substandard design elements, including:

- Narrow roadway widths [ten-foot travel lanes and four-foot shoulders]

- Narrow pedestrian facilities [three-foot six-inch sidewalks on both sides with no guardrail separating pedestrians and motor vehicles]
- Substandard bridge rails

As the Caloosahatchee River is a navigable waterway, the United States Coast Guard (USCG) regulates the horizontal and vertical clearance requirements for bridges constructed over navigable waters. The following minimum movable bridge clearance guidelines for the Caloosahatchee River at the project location are: Horizontal Clearance = 90 feet; Vertical Clearance (closed) = 21 feet. The vertical clearance for the Wilson Pigott Bridge (closed) is 26 feet at the center and 23 feet at the fenders, and the horizontal clearance is 86.6 feet. Based on this condition, the Wilson Pigott Bridge does not meet the current USCG guide for horizontal clearance.

SECONDARY CRITERIA

AREA WIDE NETWORK/SYSTEM LINKAGE: Enhance Regional Connectivity
Planned immediately north of the SR 31 project segment is the widening of SR 31 from SR 78 in Lee County to North of Cook Brown Road in Charlotte County. The proposed widening of SR 31 from SR 80 to SR 78 will provide a continuous connection from Lee County into Charlotte County and a viable north-south alternate route to I-75.

SAFETY: Improve Emergency Evacuation and Response Times
Serving as part of the emergency evacuation route network designated by the Florida Division of Emergency Management and Lee County, SR 31 [including the Wilson Pigott Bridge] plays a critical role in facilitating traffic during emergency evacuation periods as one of seven crossings over the Caloosahatchee River within Lee County. The project is in Lee County's Evacuation Zone "A", and all the neighborhoods in proximity to the project corridor are within the 100-year floodplain. Improving the operational capacity of the roadway and maintaining the functionality of the Wilson Pigott Bridge will further enhance emergency evacuation efficiency leading to improved evacuation and response times.

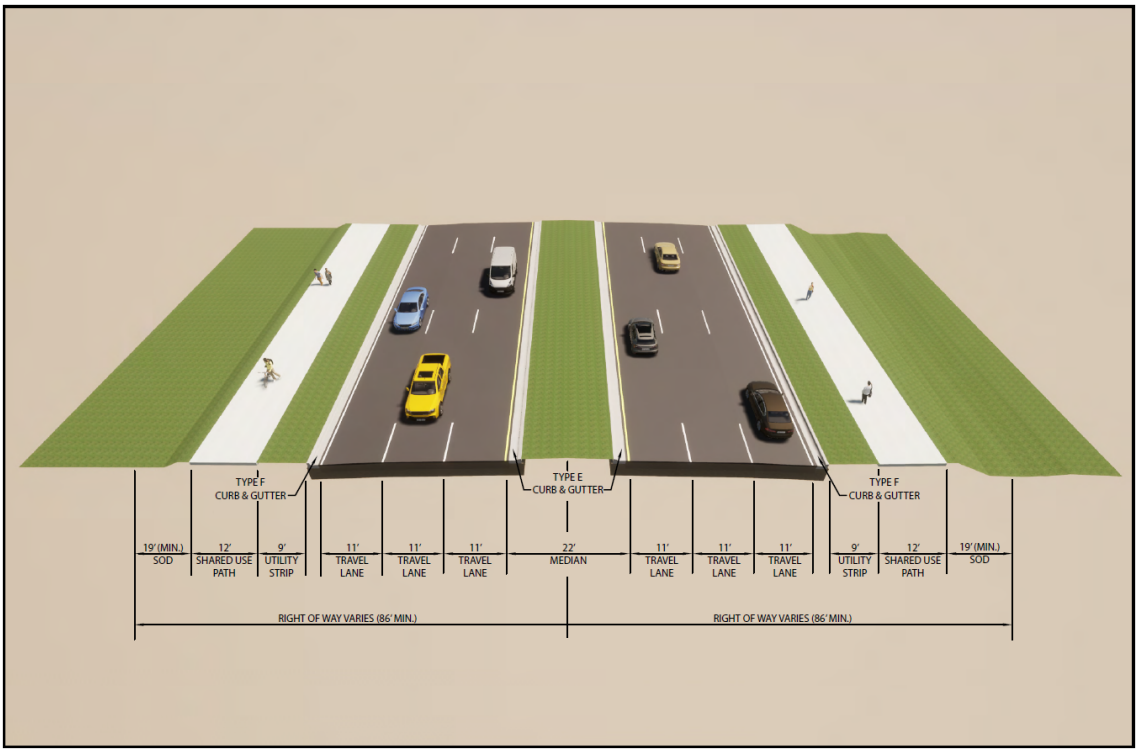
1.3 Alternatives

An alternatives analysis process consists of developing, evaluating, and eliminating potential project alternatives (including the No-Build option), based on the purpose and need for the project. This process also considers the engineering and environmental factors, along with public and stakeholder input.

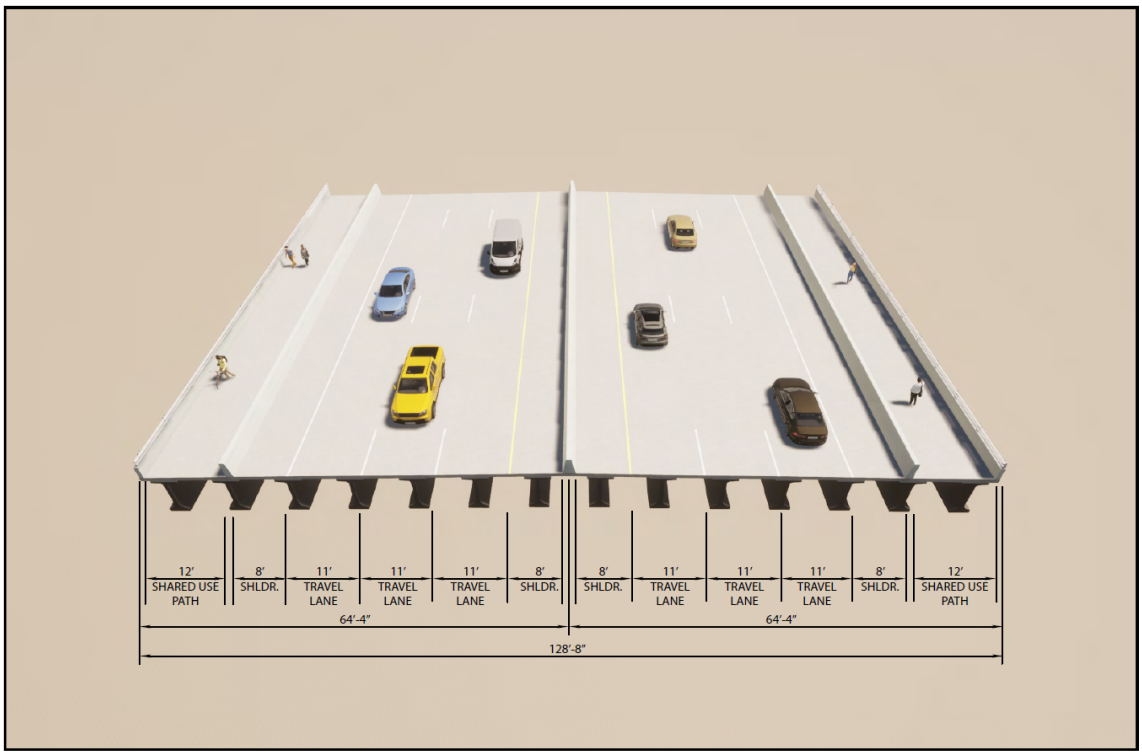
PREFERRED ALTERNATIVE
The Preferred Alternative consists of the following:

- Widen the existing two-lane undivided roadway to a six-lane divided roadway from SR 80 to SR 78
- Replace the Wilson Pigott Bridge over the Caloosahatchee River
- Improvements to the SR 31/SR 80 intersection

The Preferred Alternative will consist of widening the two-lane roadway to six lanes. The proposed SR 31 roadway typical section from SR 80 to SR 78 will include three, 11-foot travel lanes in each direction separated by a 22-foot raised median with type E and F curb along the inside and outside lanes, respectively. A 12-foot shared-use path is proposed on each side of SR 31 (northbound and southbound) with a 9-foot utility strip between the back of curb and path. **Figure 2** and **Figure 3** show the proposed roadway and bridge typical sections. This typical section will require approximately 32 acres of new right-of-way.



FDOT	SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road) FPID: 441942-1-22-01 Lee County, FL	**Proposed Roadway Typical Section** **SR 31 from SR 80 to SR 78** DATA SOURCE: Aerial Map - ESRI 2023 **March 2023**	Figure **2**



FDOT	SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road) FPID: 441942-1-22-01 Lee County, FL	**High-Level Fixed Bridge Typical Section** **SR 31 at Caloosahatchee River** DATA SOURCE: Aerial Map - ESRI 2023 **March 2023**	Figure **3**

The Preferred Alternative is a combination of widening existing SR 31 from SR 80 for about 0.7 miles, then shifting 300 feet east prior to the Wilson Pigott Bridge to minimize impacts to the existing Florida Gas Transmission (FGT) line; this roadway segment will be located east of the existing two-lane roadway and the 50-foot FGT easement. The project will tie into the proposed SR 31 North Design-Build project at the northern terminus.

The proposed design speed for the project is 45 miles per hour. The Preferred Alternative raises the profile above the current 100-year floodplain. The profile will be raised approximately three feet above existing SR 31 due to the updated 100-year floodplain elevation (from seven feet to ten feet) in the project corridor.

A new high-level fixed bridge will be constructed to replace the existing Wilson Pigott Bridge. The proposed bridge will meet USCG vertical clearance requirements of 55 feet for a high-level fixed bridge.

The Preferred Alternative also includes reconfiguring the existing intersection of SR 31/SR 80 to a grade-separated intersection. The grade-separation will introduce two new flyover bridges for SR 31 and SR 80 movements and will also include a new signal on SR 31.

Stormwater runoff from the project will be collected and conveyed in closed drainage systems to one proposed offsite pond for water quality treatment and attenuation per state and federal requirements. The pond will discharge at or near the same outfall ditch that carry the roadway runoff in the existing condition. An additional 13.5 acres of right-of-way will be required for the proposed pond and associated access easements.

1.4 Purpose of Report

The purpose of this Noise Study Report (NSR) is to identify noise sensitive land uses, which are properties adjacent to the project corridor for which there are Noise Abatement Criteria (NAC); to evaluate future traffic noise levels at the properties with and without the proposed improvements, and to evaluate the need for, and effectiveness of, noise abatement measures. Additional objectives include the consideration of potential construction noise impacts and the identification of noise impact contours adjacent to the corridor.

2.0 Methodology

The highway traffic noise analysis discussed in this NSR was prepared in accordance with Part 772 of Title 23 of the Code of Federal Regulations (23 CFR 772) - Procedures for Abatement of Highway Traffic Noise and Construction Noise, the policies/procedures documented in the FDOT's Noise Policy (FDOT PD&E Manual - Highway Traffic Noise), and guidance from the FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook and A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations document.

This Noise Study Report (NSR) section describes the sound level metrics and motor vehicle traffic data that were used to prepare the analysis and the criteria used to determine if a future design year (year 2045) traffic noise level with the new roadway would be considered an impact. Potential noise abatement measures and noise contours are also described.

2.1 Noise Metrics

The predicted highway traffic noise levels presented in this report are expressed in decibels on the "A"-weighted scale (dB(A)). This scale most closely approximates the response characteristics of the human ear to traffic noise. The noise levels in this NSR are reported as equivalent levels (Leq), which are equivalent steady-state sound levels that contain the same acoustic energy as time-varying sound levels over a period of one hour (Leq(h)).

The prediction of existing and future highway traffic noise levels with and without the roadway improvements was performed using the Federal Highway Administration's (FHWA's) computer model for highway traffic noise prediction and analysis – the Traffic Noise Model (TNM-Version 2.5). The TNM propagates sound energy, in one-third octave bands, between highways and nearby receptors taking the intervening ground's acoustical characteristics/topography and rows of buildings into account.

2.2 Traffic Data

Traffic noise levels are low when traffic volumes are low (LOS A or B) and when traffic is so congested that movement is slow (LOS D, E, or F). For the purpose of a highway traffic noise assessment, it is assumed that the maximum hourly traffic noise level occurs between these two conditions—when operating conditions are considered to be LOS C. As such, the traffic volume characteristics used in the analysis reflect either the forecast demand volumes, if the level met the LOS A or B criteria, or the LOS C volume, whichever is less. The operating conditions used in TNM to predict existing (year 2019) highway traffic noise and future (year 2045) levels with and without the Preferred Alternative are summarized in **Table 1**. Detailed project-related traffic data are provided in **Appendix A**.

Table 1. Hourly Traffic Volumes/Speeds Used in TNM

Roadway Segment	Scenario	Peak Direction Volume	Off-Peak Direction Volume	Demand or LOS C	Posted Speed (mph)
SR 31 from SR 80 to SR 78	Existing	655	515	Demand	40
	No-Build	1,020	1,020	LOS C	40
	Build	2,750	2,750	LOS C	45
SR 80 west of SR 31	Existing	2,074	1,166	Demand	45/55
	No-Build	2,750	2,750	LOS C	45/55
	Build	2,750	2,750	LOS C	45
SR 80 east of SR 31	Existing	1,785	1,785	LOS C	45
	No-Build	1,785	1,785	LOS C	45
	Build	1,785	1,785	LOS C	45

Note: Detailed traffic data are provided in Appendix A.

2.3 Noise Abatement Criteria

Noise-sensitive land uses occur where frequent human use occurs. To evaluate traffic noise at these properties, the FHWA established Noise Abatement Criteria (NAC). As shown in **Table 2**, the criteria vary according to the activity category for the land use of a property. For comparative purposes, typical noise levels for common indoor and outdoor activities are shown in **Table 3**.

Table 2. FHWA/FDOT Noise Abatement Criteria [Leq(h) Expressed in dB(A)]

Activity Category	Description of Activity Category	Activity Leq(h)[1]	
		FHWA	FDOT
A	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.	57 (Exterior)	56 (Exterior)
B[2]	Residential.	67 (Exterior)	66 (Exterior)
C[2]	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.	67 (Exterior)	66 (Exterior)
D	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.	52 (Interior)	51 (Interior)
E[2]	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.	72 (Exterior)	71 (Exterior)
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.	--	--

[1] The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.
[2] Includes undeveloped lands permitted for this activity category.
Source: CFR, Title 23, Part 772.

When predicted traffic noise levels “approach”, meet, or exceed the NAC, or when predicted future noise levels increase substantially from existing levels, the FHWA requires that noise abatement measures be considered. FDOT defines the word “approach” to mean within 1 dB(A) of the NAC. The FDOT’s NAC are also shown in Table 2. Additionally, the FDOT criteria states that a substantial increase would occur if traffic noise levels are predicted to increase 15 dB(A) or more above existing conditions as a direct result of a transportation improvement project.

Table 3. Typical Noise Levels

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL dB(A)	COMMON INDOOR ACTIVITIES
	---110---	Rock Band
Jet Fly-over at 1000 ft		
	---100---	
Gas Lawn Mower at 3 ft		
	---90---	
Diesel Truck at 50 ft, at 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 ft	---70---	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	---60---	
		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		Bedroom at Night, Concert Hall (Background)
	---20---	
	---10---	
	---0---	
Lowest Threshold of Human Hearing		Lowest Threshold of Human Hearing

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

2.4 Noise Abatement Measures

2.4.1 Traffic Management

Some traffic management measures can reduce motor vehicle-related noise. For example, trucks can be prohibited from certain streets and roads, or be permitted to only use certain streets and roads during daylight hours. The timing of traffic lights can also be changed to smooth out the flow of traffic and eliminate the need for frequent stops and starts. Reducing speed limits and increasing enforcement of speed limits is also an effective method of reducing motor vehicle noise.

2.4.2 Alignment Modifications

Modifying the alignment of a roadway can also be an effective traffic noise mitigation measure. When the horizontal alignment is shifted away from a noise sensitive land use, the sound level is reduced for the land uses that are farther from the roadway than before the shift. In certain circumstances, when a change is

made to the vertical alignment (i.e., shifting the alignment so that it is below or above the elevation of a land use), highway traffic noise may be reduced due to shielding.

2.4.3 Buffer Zones

Providing a buffer between a roadway and future noise sensitive land uses is an abatement measure that can minimize/eliminate noise impacts in areas of future development. To encourage use of this abatement measure through local land use planning, noise contours have been developed and are further discussed in Section 2.4.3.1. To abate traffic noise for an existing land use using this abatement measure, the property would have to be acquired.

2.4.3.1 Noise Contours

Land uses such as residences, motels, medical facilities, schools, churches, recreation areas, and parks are considered incompatible with highway noise levels that approach, meet, or exceed the NAC. In order to reduce the possibility of additional traffic noise-related impacts, noise level contours were developed for the future improved roadway facility to estimate where an "approach" of the NAC is predicted to occur. Specifically, these noise contours delineate the distance from the improved roadway's edge-of-pavement to where 56, 66, and 71 dB(A) (FDOT and FHWA Activity Categories A, B/C, and E, respectively) are expected to occur in the future (2045) with the proposed project improvements.

The contours are shown in **Table 4** and in **Figure 4** through **Figure 6**. Within the project limits, the contours extend from 40 to 520 feet from the improved roadway's edge-of-pavement. Local officials will be provided a copy of the NSR to promote compatibility between land development and the proposed improvements.

Table 4. Noise Contours

Distance From Improved Roadway's Edge-of-Pavement (feet)*			
Roadway Segment	**Activity Category A 56 dB(A)**	**Activity Category B/C 66 dB(A)**	**Activity Category E 71 dB(A)**
US 31 from SR 80 to SR 78	520	125	60
SR 80 west of SR 31	455	120	50
SR 80 east of SR 31	385	95	40

*See Table 2 for a description of the activities that occur within each category. Distances do not reflect any reduction in noise levels that would occur from existing structures (shielding) and should be used for planning purposes only.

Figure 4. Noise Contours for SR 31 from SR 80 to SR 78

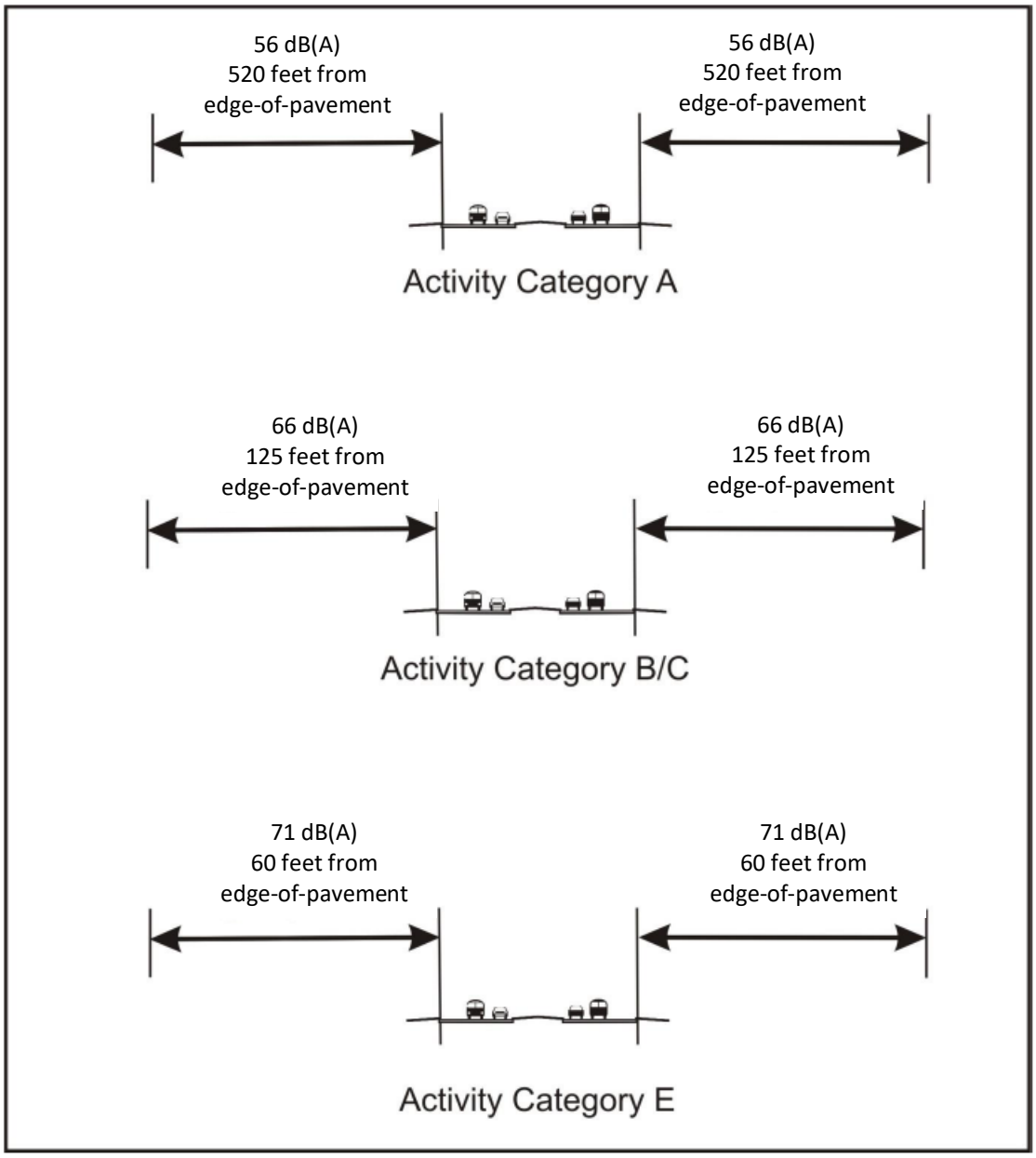


Figure 5. Noise Contours for SR 80 west of SR 31

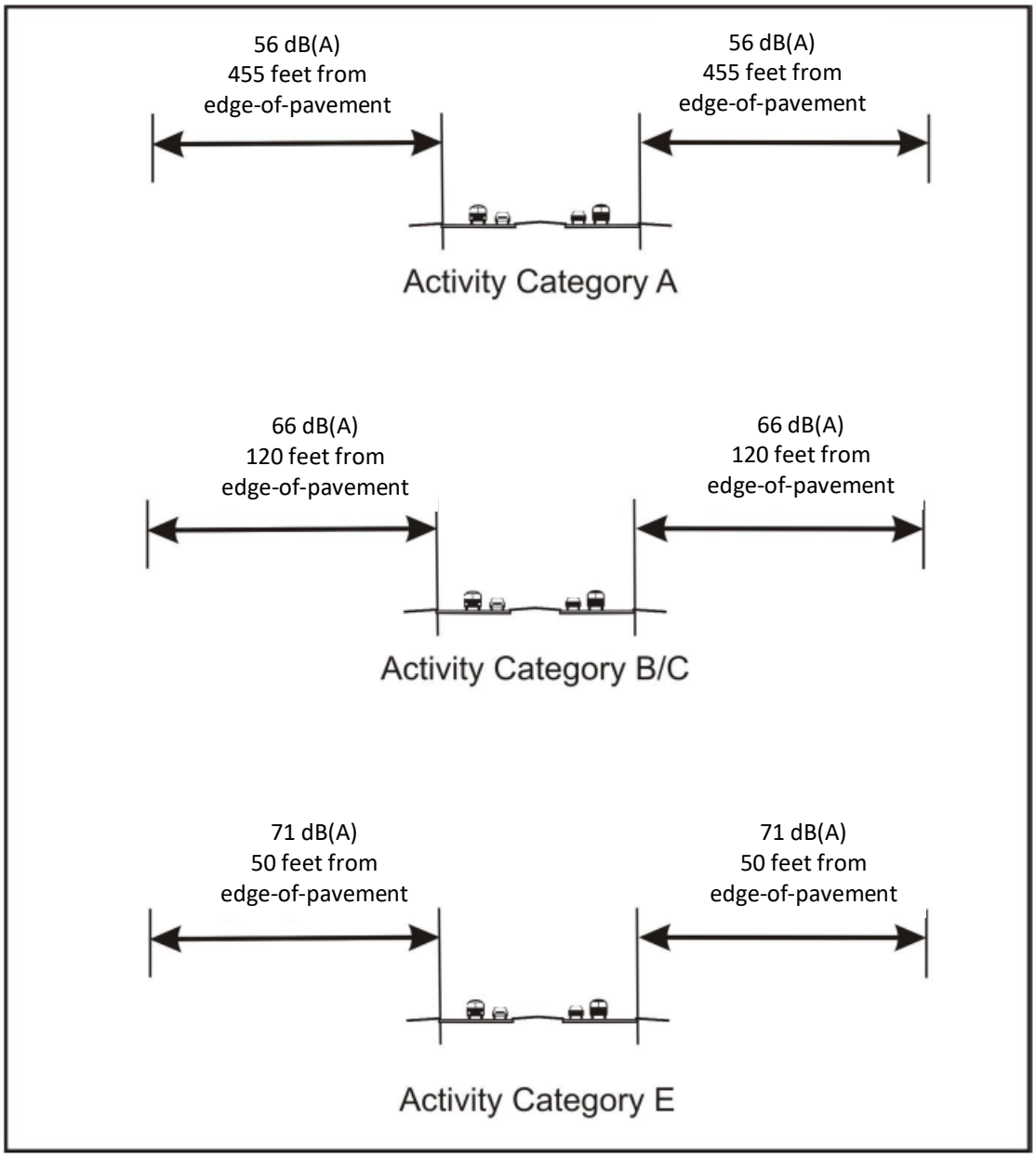
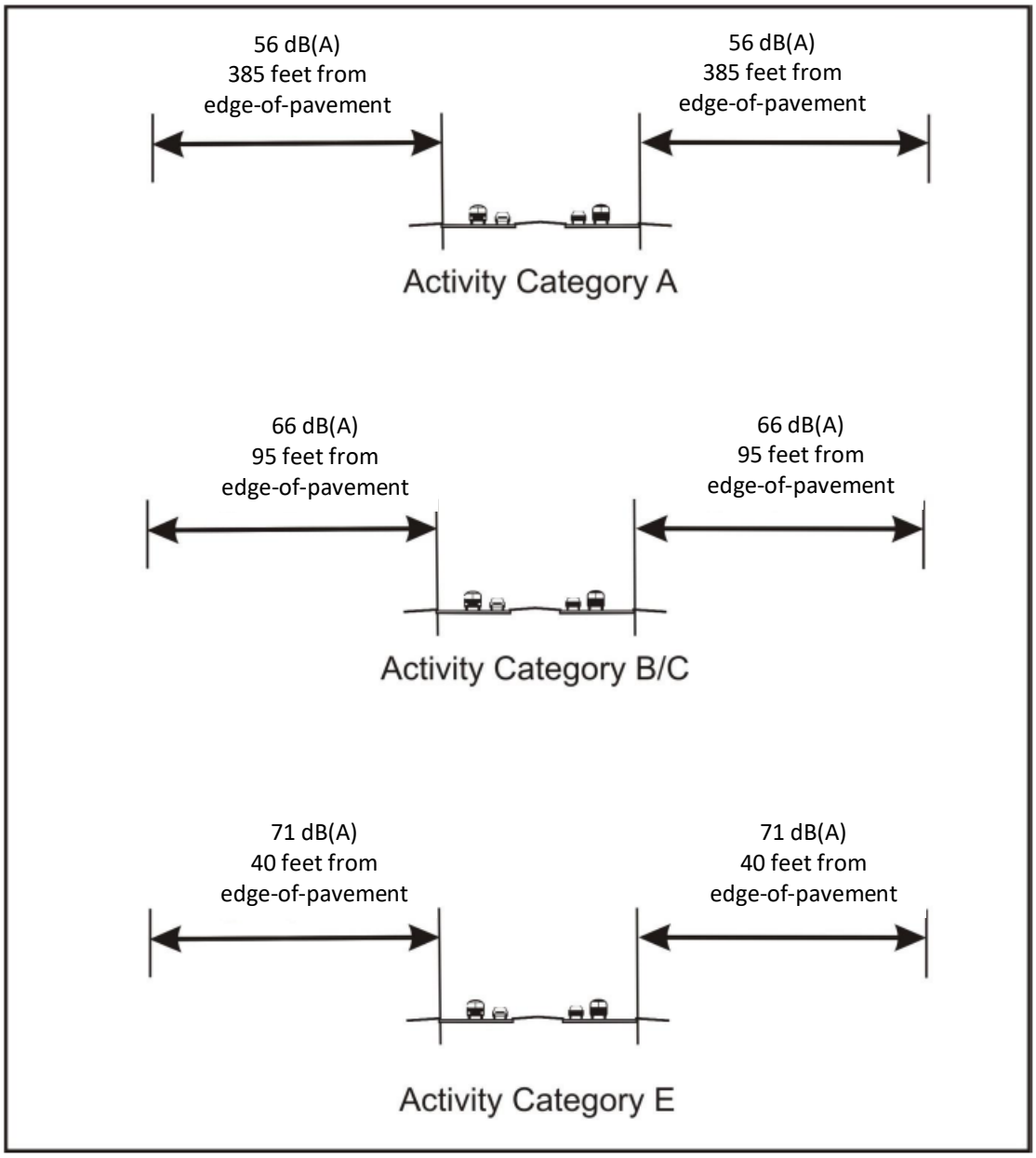


Figure 6. Noise Contours for SR 80 east of SR 31



2.4.4 Noise Barriers

Noise barriers have the potential to reduce traffic noise by interrupting the sound path between the motor vehicles on a roadway and a noise sensitive land use next to the roadway. To effectively reduce traffic noise, a barrier must be relatively long, continuous, and sufficiently tall. Use of noise barriers is the most common traffic noise abatement measure. Generally, noise barriers are most effective when placed as close to the noise source or as close to the noise receptor as possible.

2.4.5 Feasible and Reasonable Abatement Measures

For PD&E studies, a measure is considered a potential noise abatement measure if the following criteria are met:

- Minimum Noise Reduction – To meet the minimum noise reduction criteria, an abatement measure must provide at least a 5 dB(A) reduction in traffic noise for two or more impacted receptors and provide a 7 dB(A) reduction, the FDOT's Noise Reduction Design Goal (NRDG), for one or more benefited receptors. Failure of a measure to provide at least a 5 dB(A) reduction for two or more impacted receptors results in a measure being deemed not feasible. Failure to achieve the NRDG results in a measure being deemed not reasonable.

- Cost Effectiveness Criteria –Based on FDOT's Noise Policy, to be considered a reasonable abatement measure, the measure should cost no more than $42,000 per benefited receptor (i.e., per benefited property for which the land use has a NAC). For the cost of an abatement measure for a special land use (e.g., the outdoor dining area of a restaurant) to be considered reasonable, the measure should cost no more than $995,935 per person-hour per square foot. The FDOT currently uses an estimated cost of $30 per square foot for noise barrier-related materials and labor.

If the results of an abatement measure evaluation indicate that a measure would provide at least the minimum required reduction in traffic noise at a cost that is less than the cost effectiveness criteria, additional factors are considered. Depending on the measure, feasibility factors relate to design and construction (i.e., given site-specific details, can an abatement measure be implemented), safety, accessibility, Right-of-Way requirements, maintenance, and impacts on utilities and/or drainage. Because the analysis is performed on conceptual designs for roadway improvements, noise abatement measures are only identified as being potentially feasible and reasonable at the conclusion of a project's PD&E phase. For such measures, the FDOT makes a commitment to perform detailed analysis in the project's design phase (including obtaining the viewpoints of the property owners and/or residents of the benefited properties) when the final construction plans for an improvement are prepared.

3.0 Noise Analysis

3.1 Model Validation

As previously stated, existing and future noise levels with and without the Preferred Alternative were modeled using the TNM. To validate the TNM and verify that the model accurately predicts the existing traffic noise based on current conditions, measured sound levels were obtained within the project corridor. Traffic data recorded during each measurement period included motor vehicle volumes, vehicle mix, vehicle speeds, and meteorological conditions.

The field measurements were conducted in accordance with the FHWA's Noise Measurement Handbook. The measurements were obtained using a Larson Davis LxT Type 2 integrating sound level meter (SLM). The SLM was calibrated before and after the measurement periods with a Larson Davis CAL200 calibrator.

The recorded traffic data were used as input for the TNM to determine if, given the topography and actual site conditions of the area, the computer model could "re-create" the measured levels with the existing roadway. Following FDOT policy, a noise prediction model is considered within an acceptable level of accuracy if the measured and predicted noise levels are within a tolerance standard of 3 dB(A).

Table 5 presents the field measurements and the validation results. As shown, the ability of the model to predict noise levels within an acceptable level of accuracy (plus or minus 3 dB(A)) for the project was confirmed. Measured levels were slightly higher than the modeled levels due to the SLM measuring traffic noise as well as background noise (cars idling at the marina access road stop sign, wind-blown vegetation, and an aircraft flyover), whereas the TNM only predicts traffic noise. Documentation in support of the validation is provided in **Appendix B**.

Table 5. Validation Data

Location	Measurement Period	Measured Noise Level (dB(A))	Modeled Noise Level (dB(A))	Difference (Measured – Modeled)
West of SR 31 and south of the Sweetwater Landing Marina	1	67.6	66.4	1.2
	2	68.0	66.2	1.8
	3	69.7	67.0	2.7

Note: The field measurement location is identified on the project aerials in Appendix C of this report.

3.2 Noise Sensitive Land Uses

Within the project limits, 51 properties with noise sensitive land uses have the potential to be impacted by highway traffic noise as a result of the proposed project improvements. The land use review that identified these properties was performed on December 27, 2022. Note that another land use review will be conducted to identify noise sensitive land uses that were issued building permits after December 27, 2022, but before the Date of Public Knowledge, and if any are identified, the potential for traffic noise impacts would be evaluated. The 51 sites are comprised of the following:

1. Activity Category B – 45 residences (12 at Cottonwood Bend at Verandah townhomes, 9 at Ft Myers Shores north of SR 80, 3 mobile homes east of SR 31, 4 full-hookup slips at the Sweetwater Landing Marina, 16 at Ft Myers Shores east of SR 31, and 1 north of the river). The FDOT's NAC for Activity Category B land uses is an exterior level of 66 dB(A).

2. Activity Category C – 1 active sports area (Verandah Golf Course). The FDOT's NAC for Activity Category C land uses is an exterior level of 66 dB(A).

3. Activity Category D – Interior traffic noise levels were evaluated at 1 medical facility (Dental Care at Verandah) and 1 fire station (Ft Myers Shores Fire Department). The FDOT's interior NAC for Activity Category D land uses is 51 dB(A). Interior traffic noise levels were predicted by applying the noise reduction factor for masonry buildings (25 dB(A)) to the predicted exterior noise levels as recommended by FHWA's Highway Traffic Noise: Analysis and Abatement Guidance.

4. Activity Category E – 3 outdoor dining areas (Shores Bar & Grill, RacTrac, and The Boathouse Tiki Bar & Grill). The FDOT's exterior NAC for Activity Category E land uses is 71 dB(A).

The 51 properties were evaluated using 33 receptors (i.e., discrete or representative locations of a noise sensitive land use). For the golf course, a receptor was placed at an outdoor use location nearest the roadway (i.e., the putting green). The 33 receptors comprise 12 common noise environments (CNE). A CNE is a group of receptors within the same activity category that are exposed to similar noise sources and levels; traffic volumes, traffic mix, speed, and topographic features. The CNE and receptor locations are shown on the project aerials in **Appendix C**.

Notably, there are existing privacy berms/walls located between SR 80 and the Cottonwood Bend at Verandah townhomes and the Verandah Golf Course. These berms/walls were included in the TNM input.

3.3 Predicted Noise Levels

The predicted noise levels are provided in **Appendix D**. The results of the analysis indicate that the existing (year 2019) exterior traffic noise levels range from 44.6 to 66.1 dB(A), and the interior traffic noise levels at the medical facility and the fire station are predicted to be 34.6 and 43.5 dB(A), respectively. In the future (year 2045) without the proposed project improvements (the No-Build Alternative), exterior traffic noise levels are predicted to range from 46.9 to 66.1 dB(A), and the interior levels at the medical facility and the fire station are predicted to be 35.5 and 43.5 dB(A), respectively. In the future with the proposed project improvements (the Preferred Alternative), exterior traffic noise levels are predicted to range from 53.3 to 65.8 dB(A), and the interior levels at the medical facility and the fire station are predicted to be 36.4 and 42.6 dB(A), respectively. As such, based on the results of the analysis, highway traffic noise levels in the

future with the proposed improvements are not predicted to approach, meet, or exceed the NAC at any of the evaluated receptors.

The results of the analysis also indicate that when compared to existing conditions, traffic noise levels with the proposed improvements would not increase more than 9.5 dB(A) at any receptor. As such, the project would not substantially increase highway traffic noise (i.e., an increase of 15 dB(A) or more) at any of the evaluated receptors.

4.0 Conclusions

Based on the results of the noise analysis, there are no highway traffic noise impacted land uses within the project area that require abatement consideration. Should the proposed improvements change during the project's final design phase such that a re-analysis of highway traffic noise is warranted and impacts are identified in the analysis, an evaluation of noise abatement measures would be performed at that time. The FDOT is committed to the construction of feasible and reasonable noise abatement measures at noise-impacted locations contingent on the following:

1. Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;
2. Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
3. Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Office; and
4. Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed and any conflicts or issues resolved.

5.0 Construction Noise and Vibration

The residences and the medical facility within the project limits are considered to be construction noise and vibration sensitive sites. Construction of the roadway improvements is not expected to have a substantial 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 application of the FDOT Standard Plans 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 coordination with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

6.0 Community Coordination

The FDOT conducted an Alternatives Public Meeting for the SR 31 PD&E Study on January 31, 2023, at The Field House at Babcock Ranch. A Public Hearing is preliminarily scheduled for the fall of 2023. The hearing will inform the public of the results of the PD&E Study and provide the opportunity for the public to express their views regarding specific location, design, socio-economic effects, and environmental impacts associated with the No-Build and the Preferred Alternative.

Upon approval of the project's environmental document, a copy of the final NSR will be provided to the Lee County Community Development office for their use associated with planning for development after the date of public knowledge. Noise contours are discussed in Section 2.4.3.1 and shown in Table 4 and in Figure 4 through Figure 6 to assist planning and zoning with a best estimate on distances from the proposed edge-of-pavement at which traffic noise levels would meet or exceed the FDOT's NAC for activity categories A through E.

7.0 References

FDOT. Project Development and Environment Manual, Part 2, Chapter 18 – Highway Traffic Noise, July 2023.
https://www.fdot.gov/environment/pubs/pdeman/pdeman-current

FDOT. Traffic Noise Modeling and Analysis Practitioners Handbook, December 2018.
https://www.fdot.gov/environment/publications.shtm

University of Central Florida, 2009. A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations. Roger L. Wayson and John M. MacDonald. July 22, 2009 Update.
https://www.fdot.gov/environment/publications.shtm

FHWA. Report FHWA-HEP-18-065, Noise Measurement Handbook: Final Report, June 2018.
https://www.fhwa.dot.gov/environment/noise/measurement/fhwahep18065.pdf

Title 23 CFR § 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, July 13, 2010.
http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title23/23cfr772_main_02.tpl

California Department of Transportation. Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.
https://dot.ca.gov/programs/environmental-analysis/noise-vibration

FHWA. Report Number FHWA-PD-96-009, FHWA Traffic Noise Model User's Guide (Version 2.5 Addendum). April 2004.
http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v25/users_manual/index.cfm

FHWA. Report Number FHWA-HEP-10-025, Highway Traffic Noise: Analysis and Abatement Guidance. December 2011.
https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf

FDOT. Standard Plans for Road and Bridge Construction. July 2023.
https://www.fdot.gov/design/standardplans/default.shtm

Appendix A Traffic Data

TRAFFIC DATA FOR NOISE STUDIES - SUMMARY OUTPUT
FDOT DISTRICT 1

Federal Aid Number(s):	N/A
FPID Number(s):	441942-1-22-01
State/Federal Route No.:	SR 31
Road Name:	Babcock Ranch Road
Project Description:	Add Lanes and Reconstruct
Segment Description:	SR 80 to SR 78
Section Number:	120030
Mile Post To/From:	0.00 - 1.402

Existing Facility:		D =	**56.00%**	%
		T24 =	**10.56%**	% of 24 Hour Volume
Year:	**2019**	Tpeak =	**5.28%**	% of Design Hour Volume
		MT =	**2.67%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**1020**	HT =	**2.33%**	% of Design Hour Volume
Demand Peak Hour Volume:	**655**	B =	**0.29%**	% of Design Hour Volume
Posted Speed:	**40**	MC =	**0.82%**	% of Design Hour Volume

No Build Alternative (Design Year):		D =	**56.00%**	%
		T24 =	**10.56%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**5.28%**	% of Design Hour Volume
		MT =	**2.67%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**1020**	HT =	**2.33%**	% of Design Hour Volume
Demand Peak Hour Volume:	**2913**	B =	**0.29%**	% of Design Hour Volume
Posted Speed:	**40**	MC =	**0.82%**	% of Design Hour Volume

Build Alternative (Design Year):		D =	**56.00%**	%
		T24 =	**10.56%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**5.28%**	% of Design Hour Volume
		MT =	**2.67%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**2750**	HT =	**2.33%**	% of Design Hour Volume
Demand Peak Hour Volume:	**3241**	B =	**0.29%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.82%**	% of Design Hour Volume

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

Prepared By: Naresh Kotari (Print Name) _____ (Signature) Date: 4/20/2023

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

FDOT Reviewer: Brittany Nichols (Print Name) DocuSigned by: Brittany Nichols 3491A225DF874FE... (Signature) Date: 05/01/2023 | 1:25 PM EDT

FDOT TRAFFIC DATA FOR NOISE STUDIES - DETAILED OUTPUT

Prepared By: Naresh Kotari **Date:** 4/20/2023 **Approved for Use By:** _____ **Date:** _____

Federal Aid Number(s): N/A **Section Number:** 120030

FPID Number(s): 441942-1-22-01 **Mile Post To/From:** 0.00 - 1.402

State/Federal Route No.: SR 31

Road Name: Babcock Ranch Road

Project Description: Add Lanes and Reconstruct

Segment Description: SR 80 to SR 78

Note: Data sheets are to be completed for each segment having a change in traffic parameters (i.e., volume posted speed, typical section)

Demand Peak Hour/LOS C	Peak or Off-Peak Direction	Vehicle Type	Existing	No Build (Design Year)	Build (Design Year)
			Year: 2019	Year: 2045	Year: 2045
			Posted Speed: 40	Posted Speed: 40	Posted Speed: 45
			Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 6
			Number of Vehicles	Number of Vehicles	Number of Vehicles
See Columns to Right > for Which Volumes To Use (Demand or LOS C)			Use Demand Volumes	Use LOS C	Use LOS C
Demand Peak Hour	Peak Direction	Autos	616	2735	3042
		Med Trucks	17	78	87
		Heavy Trucks	15	68	76
		Buses	2	8	9
		Motorcycles	5	24	27
		Total	655	2913	3241
	Off-Peak Direction	Autos	484	2149	2391
		Med Trucks	14	61	68
		Heavy Trucks	12	53	59
		Buses	1	7	7
		Motorcycles	4	19	21
		Total	515	2289	2546
LOS C	Peak Direction	Autos	958	958	2582
		Med Trucks	27	27	73
		Heavy Trucks	24	24	64
		Buses	3	3	8
		Motorcycles	8	8	23
		Total	1020	1020	2750
	Off-Peak Direction	Autos	958	958	2582
		Med Trucks	27	27	73
		Heavy Trucks	24	24	64
		Buses	3	3	8
		Motorcycles	8	8	23
		Total	1020	1020	2750

TRAFFIC DATA FOR NOISE STUDIES - SUMMARY OUTPUT
FDOT DISTRICT 1

Federal Aid Number(s):	N/A
FPID Number(s):	441942-1-22-01
State/Federal Route No.:	SR 80
Road Name:	Palm Beach Boulevard
Project Description:	Add Lanes and Reconstruct
Segment Description:	SR 80 - W of SR 31
Section Number:	126005
Mile Post To/From:	0

Existing Facility:		D =	**64.00%**	%
		T24 =	**7.22%**	% of 24 Hour Volume
Year:	**2019**	Tpeak =	**3.61%**	% of Design Hour Volume
		MT =	**1.50%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**2750**	HT =	**1.70%**	% of Design Hour Volume
Demand Peak Hour Volume:	**2074**	B =	**0.41%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.39%**	% of Design Hour Volume

No Build Alternative (Design Year):		D =	**64.00%**	%
		T24 =	**7.22%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**3.61%**	% of Design Hour Volume
		MT =	**1.50%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**2750**	HT =	**1.70%**	% of Design Hour Volume
Demand Peak Hour Volume:	**3076**	B =	**0.41%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.39%**	% of Design Hour Volume

Build Alternative (Design Year):		D =	**64.00%**	%
		T24 =	**7.22%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**3.61%**	% of Design Hour Volume
		MT =	**1.50%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**2750**	HT =	**1.70%**	% of Design Hour Volume
Demand Peak Hour Volume:	**3082**	B =	**0.41%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.39%**	% of Design Hour Volume

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

Prepared By: Naresh Kotari (Print Name) _____ (Signature) Date: 4/20/2023

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

FDOT Reviewer: Brittany Nichols (Print Name) DocuSigned by: Brittany Nichols 3491A225DF874FE... (Signature) Date: 05/01/2023 | 1:25 PM EDT

FDOT TRAFFIC DATA FOR NOISE STUDIES - DETAILED OUTPUT

Prepared By: Naresh Kotari **Date:** 4/20/2023 **Approved for Use By:** _____ **Date:** _____

Federal Aid Number(s): N/A **Section Number:** 126005

FPID Number(s): 441942-1-22-01 **Mile Post To/From:** 0

State/Federal Route No.: SR 80

Road Name: Palm Beach Boulevard

Project Description: Add Lanes and Reconstruct

Segment Description: SR 80 - W of SR 31

Note: Data sheets are to be completed for each segment having a change in traffic parameters (i.e., volume posted speed, typical section)

Demand Peak Hour/LOS C	Peak or Off-Peak Direction	Vehicle Type	Existing	No Build (Design Year)	Build (Design Year)
			Year: 2019	Year: 2045	Year: 2045
			Posted Speed: 45	Posted Speed: 45	Posted Speed: 45
			Number of Travel Lanes: 6	Number of Travel Lanes: 6	Number of Travel Lanes: 6
			Number of Vehicles	Number of Vehicles	Number of Vehicles
See Columns to Right > for Which Volumes To Use (Demand or LOS C)			Use Demand Volumes	Use LOS C	Use LOS C
Demand Peak Hour	Peak Direction	Autos	1991	2953	2959
		Med Trucks	31	46	46
		Heavy Trucks	35	52	52
		Buses	9	13	13
		Motorcycles	8	12	12
		Total	2074	3076	3082
	Off-Peak Direction	Autos	1119	1661	1664
		Med Trucks	17	26	26
		Heavy Trucks	20	29	29
		Buses	5	7	7
		Motorcycles	5	7	7
		Total	1166	1730	1733
LOS C	Peak Direction	Autos	2640	2640	2640
		Med Trucks	41	41	41
		Heavy Trucks	47	47	47
		Buses	11	11	11
		Motorcycles	11	11	11
		Total	2750	2750	2750
	Off-Peak Direction	Autos	2640	2640	2640
		Med Trucks	41	41	41
		Heavy Trucks	47	47	47
		Buses	11	11	11
		Motorcycles	11	11	11
		Total	2750	2750	2750

TRAFFIC DATA FOR NOISE STUDIES - SUMMARY OUTPUT
FDOT DISTRICT 1

Federal Aid Number(s):	N/A
FPID Number(s):	441942-1-22-01
State/Federal Route No.:	SR 80
Road Name:	Palm Beach Boulevard
Project Description:	Add Lanes and Reconstruct
Segment Description:	SR 80 - E of SR 31
Section Number:	120085
Mile Post To/From:	0

Existing Facility:		D =	**56.00%**	%
		T24 =	**6.57%**	% of 24 Hour Volume
Year:	**2019**	Tpeak =	**3.28%**	% of Design Hour Volume
		MT =	**1.55%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**1785**	HT =	**1.28%**	% of Design Hour Volume
Demand Peak Hour Volume:	**1966**	B =	**0.45%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.41%**	% of Design Hour Volume

No Build Alternative (Design Year):		D =	**56.00%**	%
		T24 =	**6.57%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**3.28%**	% of Design Hour Volume
		MT =	**1.55%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**1785**	HT =	**1.28%**	% of Design Hour Volume
Demand Peak Hour Volume:	**2460**	B =	**0.45%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.41%**	% of Design Hour Volume

Build Alternative (Design Year):		D =	**56.00%**	%
		T24 =	**6.57%**	% of 24 Hour Volume
Year:	**2045**	Tpeak =	**3.28%**	% of Design Hour Volume
		MT =	**1.55%**	% of Design Hour Volume
LOS C Peak Hour Directional Volume:	**1785**	HT =	**1.28%**	% of Design Hour Volume
Demand Peak Hour Volume:	**2485**	B =	**0.45%**	% of Design Hour Volume
Posted Speed:	**45**	MC =	**0.41%**	% of Design Hour Volume

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

Prepared By: Naresh Kotari (Print Name) _____ (Signature) Date: 4/20/2023

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

FDOT Reviewer: Brittany Nichols (Print Name) DocuSigned by: Brittany Nichols 3491A225DF874FE... (Signature) Date: 05/01/2023 | 1:25 PM EDT

FDOT TRAFFIC DATA FOR NOISE STUDIES - DETAILED OUTPUT

Prepared By: Naresh Kotari **Date:** 4/20/2023 **Approved for Use By:** _____ **Date:** _____

Federal Aid Number(s): N/A **Section Number:** 120085

FPID Number(s): 441942-1-22-01 **Mile Post To/From:** 0

State/Federal Route No.: SR 80

Road Name: Palm Beach Boulevard

Project Description: Add Lanes and Reconstruct

Segment Description: SR 80 - E of SR 31

Note: Data sheets are to be completed for each segment having a change in traffic parameters (i.e., volume posted speed, typical section)

Demand Peak Hour/LOS C	Peak or Off-Peak Direction	Vehicle Type	Existing	No Build (Design Year)	Build (Design Year)
			Year: 2019	Year: 2045	Year: 2045
			Posted Speed: 45	Posted Speed: 45	Posted Speed: 45
			Number of Travel Lanes: 4	Number of Travel Lanes: 4	Number of Travel Lanes: 4
			Number of Vehicles	Number of Vehicles	Number of Vehicles
See Columns to Right > for Which Volumes To Use (Demand or LOS C)			Use LOS C	Use LOS C	Use LOS C
Demand Peak Hour	Peak Direction	Autos	1894	2370	2393
		Med Trucks	30	38	39
		Heavy Trucks	25	31	32
		Buses	9	11	11
		Motorcycles	8	10	10
		Total	1966	2460	2485
	Off-Peak Direction	Autos	1487	1860	1880
		Med Trucks	24	30	30
		Heavy Trucks	20	25	25
		Buses	7	9	9
		Motorcycles	6	8	8
		Total	1544	1932	1952
LOS C	Peak Direction	Autos	1719	1719	1719
		Med Trucks	28	28	28
		Heavy Trucks	23	23	23
		Buses	8	8	8
		Motorcycles	7	7	7
		Total	1785	1785	1785
	Off-Peak Direction	Autos	1719	1719	1719
		Med Trucks	28	28	28
		Heavy Trucks	23	23	23
		Buses	8	8	8
		Motorcycles	7	7	7
		Total	1785	1785	1785

Appendix B Validation Documentation

NOISE MEASUREMENT DATA SHEET

Measurements Taken By: Robyn Hartz & Wayne Arner Date: 12-27-22
Time Run 1 Started: 15:51 pm Time Run 1 Ended: 16:01 pm
Time Run 2 Started: 16:05 pm Time Run 2 Ended: 16:15 pm
Time Run 3 Started: 16:19 pm Time Run 3 Ended: 16:29 pm
Project Identification:
Financial Project ID: 441942-1-22-01
Project Location: US 31 Ft Myers
Site Identification: West side of US 31 just south of the Sweetwater Landing Marina

Weather Conditions:
Sky: Clear X Partly Cloudy Cloudy Other
Temperature 74F Wind Speed 1.5mph Wind Direction from SW Humidity 39%
Equipment:
Sound Level Meter:
Type: Larson Davis LxT
Did you check the battery? Yes X
Calibration Readings: Start 114.1 End 113.9
Response Settings: Slow
Weighting: A
Calibrator:
Type: LD CAL200
Did you check the battery? Yes

TRAFFIC DATA (Run 1/Run 2/Run 3)

Roadway Identification	US 31 NB		US 31 SB	
Vehicle Type	Volume	Speed (mph)	Volume	Speed (mph)
Autos	77/79/94	47/51/51	101/104/88	49/48/51
Medium Trucks	9/4/6	47/52/42	9/4/6	51/48/51
Heavy Trucks	1/1/2	45/46/48	1/1/2	49/44/49
Buses	0/0/0	na/na/na	0/0/0	na/na/na
Motorcycles	0/0/0	na/na/na	0/0/2	na/na/58
Duration	Three 10-minute sample periods		Three 10-minute sample periods	

RESULTS [dB(A)]

L_{EQ} 67.6 (Run 1), 68.0 (Run 2), 69.7 (Run 3)

Primary Noise: Traffic on US 31
Background Noise: Passbys on access road, leaves rustling, and aircraft flyover (Run 3)

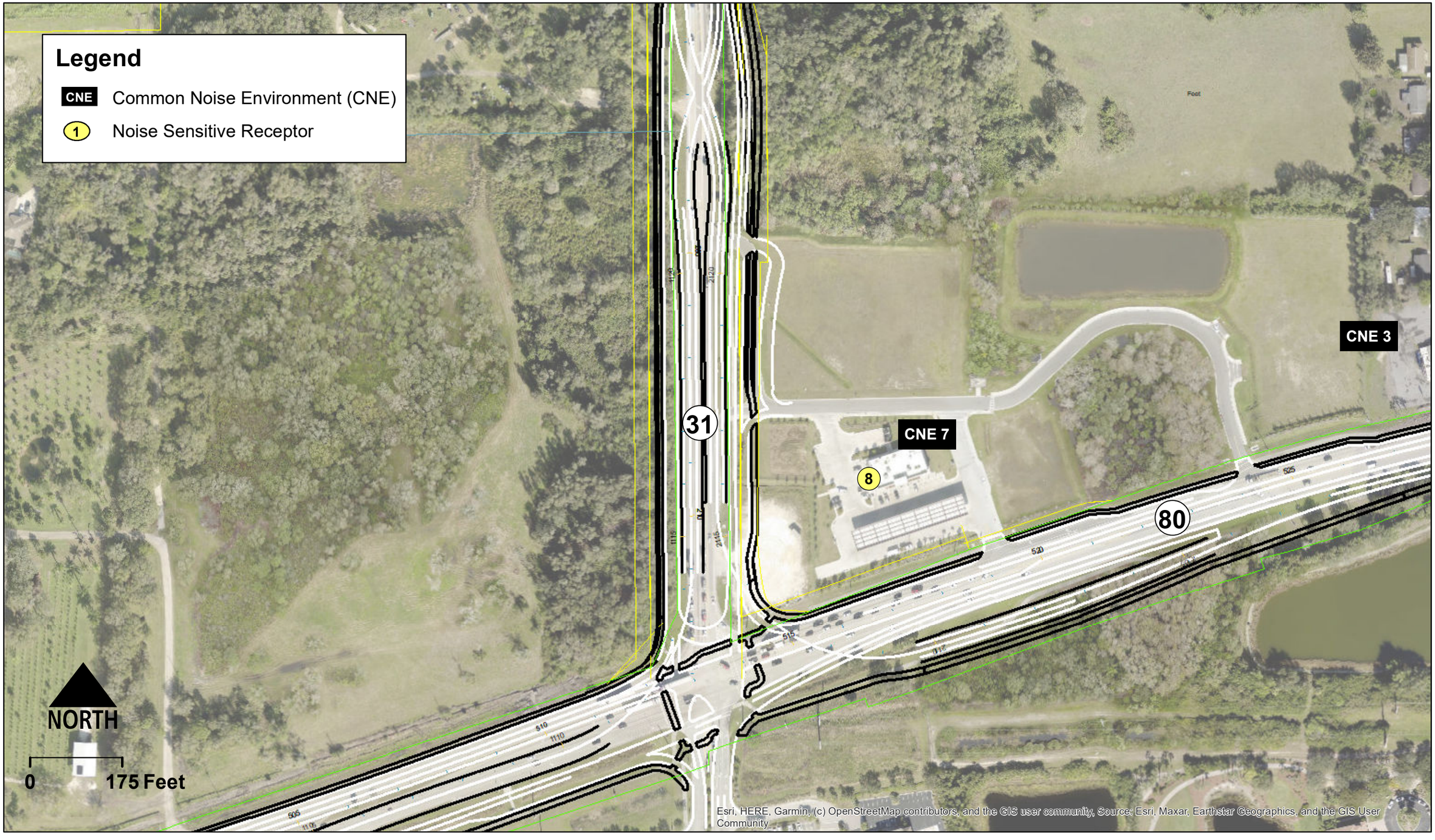
Appendix C Project Aerials

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
FPID: 441942-1-22-01

Noise Sensitive Receptors
Sheet 1 of 8

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
FPID: 441942-1-22-01

Noise Sensitive Receptors



FDOT

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
FPID: 441942-1-22-01

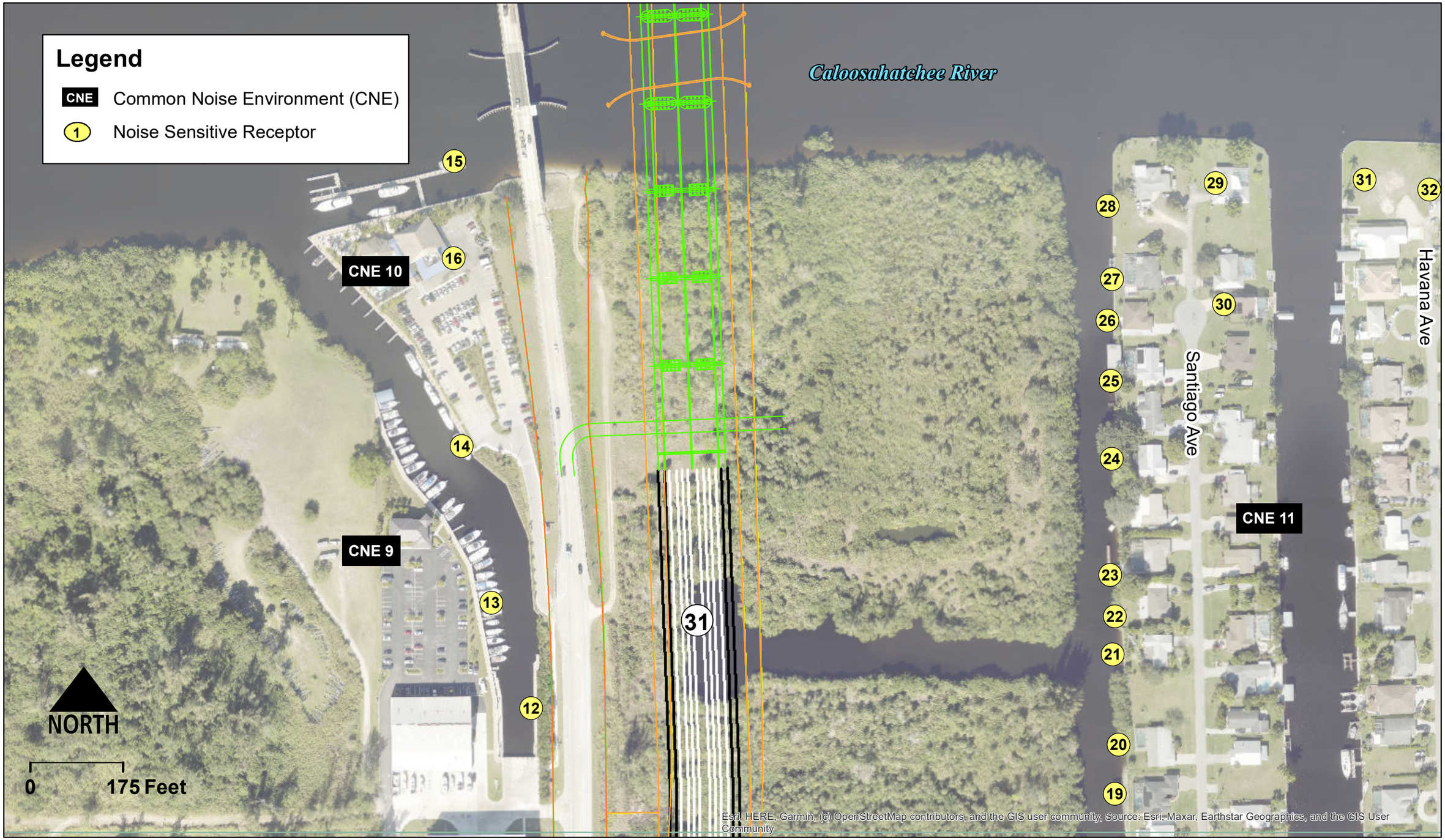
Noise Sensitive Receptors

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
FPID: 441942-1-22-01

Noise Sensitive Receptors

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
FPID: 441942-1-22-01

Noise Sensitive Receptors



SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
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Noise Sensitive Receptors
Sheet 6 of 8

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
Lee County, FL
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Noise Sensitive Receptors

SR 31 from SR 80 (Palm Beach Boulevard) to SR 78 (Bayshore Road)
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Noise Sensitive Receptors

Appendix D Predicted Noise Levels

Site ID	Activity Category	Location	No. of Sites	Existing (2019) dB(A)	No-Build (2045) dB(A)	Preferred Alternative (2045) dB(A)	Increase from Existing dB(A)	Approaches, Meets, or Exceeds the NAC? (Y/N)
1	B	Residences at Cottonwood Bend at Verandah	12	52.3	54.5	54.3	2.0	N
2	D	Dental Care at Verandah	1	34.6	35.5	36.4	1.8	N
3	E	Shores Bar & Grill	1	66.1	66.1	65.0	-1.1	N
4	B	Residences at Ft Myers Shores north of SR 80 on First St	6	60.0	60.1	58.9	-1.1	N
5	B		3	63.5	63.5	61.9	-1.6	N
6	C	Verandah Golf Course	1	56.5	56.6	57.1	0.6	N
7	D	Ft Myers Shores Fire Department	1	43.5	43.5	42.6	-0.9	N
8	E	RacTrac	1	61.8	62.5	64.4	2.6	N
9	B	Residences on the east side of SR 31 between SR 80 and the Marina	1	57.9	60.2	65.7	7.8	N
10	B		1	55.0	57.3	62.6	7.6	N
11	B		1	57.9	60.2	65.8	7.9	N
12	B	Slips at Sweetwater Landing Marina	1	63.6	66.0	59.4	-4.2	N
13	B		1	58.6	61.0	58.3	-0.3	N
14	B		1	56.5	58.8	57.3	0.8	N
15	B		1	59.8	62.1	56.9	-2.9	N
16	E	The Boathouse Tiki Bar & Grill	1	57.6	59.9	56.9	-0.7	N
17	B	Residences at Ft Myers Shores east of SR 31 and south of the Caloosahatchee River	1	45.7	47.8	55.1	9.4	N
18	B		1	45.7	47.8	55.1	9.4	N
19	B		1	45.8	48.0	55.3	9.5	N
20	B		1	46.0	48.2	55.4	9.4	N
21	B		1	46.6	48.8	55.4	8.8	N
22	B		1	46.5	48.7	55.6	9.1	N
23	B		1	46.5	48.8	55.6	9.1	N
24	B		1	46.9	49.2	55.5	8.6	N
25	B		1	47.3	49.6	55.4	8.1	N
26	B		1	47.7	50.0	55.5	7.8	N
27	B		1	47.9	50.2	55.6	7.7	N
28	B		1	48.4	50.7	55.7	7.3	N
29	B		1	47.0	49.3	55.0	8.0	N
30	B		1	46.4	48.7	54.8	8.4	N
31	B		1	45.8	48.1	53.9	8.1	N
32	B		1	45.1	47.3	53.3	8.2	N
33	B	Residence east of SR 31 and north of the Caloosahatchee River	1	44.6	46.9	53.8	9.2	N

Appendix E TNM Modeling Files and PDF of the NSR (provided electronically)